



Private prescription:

A thought-provoking tonic on the lighter side

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Mnemonics – the art of recollection

I am very forgetful of people's names. I can recognise faces and even remember where I have seen them before but putting names to faces I find extremely difficult, much to my embarrassment at conferences. Forgetting important facts in an exam can be even more disastrous for a student sitting finals. For Dominic O'Brien, seven times winner of the World Memory Championships, committing things to memory is a straight-forward task [1]. Over the years, he has perfected a variety of mnemonics or devices for improving memory, ranging from word-based mnemonics based on acronyms, extended acronyms and verses, to topical mnemonics based on imagined places, pictures and journeys. It is interesting to note that both techniques can be applied to memorising facts in pharmaceutical and medical science.

Word-based mnemonics

Many people use these routinely to recall facts. They can vary from simple acronyms, such as HOMES to recall the names of the five Great Lakes (Huron, Ontario, Michigan, Erie and Superior), to extended acronyms, such as 'Richard Of York Gave Battle In Vain' or 'Read Out Your Green Book In Verse', to recall the colours of the rainbow (Red, Orange, Yellow,

Green, Blue, Indigo and Violet). Some word-based mnemonics have even been set to verse, for example, the one that is used to recall the fate of each of King Henry VIII's wives – divorced, beheaded, died; divorced, beheaded, survived.

'Mnemonics can provide a means of enhancing the recall of pharmacological and medical facts.'

How effective these techniques are depends on one's ability to remember acronyms or extended acronyms in the first place. I must admit, I can still recall from my school days the 12 cranial nerves in order (Olfactory, Optic, Oculomotor, Pathetic, Trigeminal, Abducent, Facial, Auditory, Glossopharyngeal, Vagus, Spinal and Hypoglossal) through the use of an extended acronym 'Oh, Oh, Oh, Please Take A Fig And Give Vernon Some Hay'. Incidentally, it would appear that the oculomotor is now called the common oculomotor, the abducent is now called the external oculomotor and the vagus, the pneumogastric. Hence, the extended acronym now reads 'Out Of Common Practice The Expert Finds A Good Plaster Stops Haemorrhages'.

Medics often resort to the use of word-based mnemonics, especially for recalling anatomical facts (as in the 12 cranial nerves) and diagnoses. I recently came across a delightful book on differential diagnosis listing some interesting extended acronyms to help the doctor to organize diagnostic possibilities quickly and effectively for a wide variety of clinical scenarios [2]. For instance, kidney stones are among the most painful of afflictions, hence the mnemonic 'OUCHS', standing for Oxalate (a common component of kidney stones), Uric acid (stones that occur at low pH), Cystine (stones seen in patients with hereditary cystinosis), Hypercalcemia (a cause of calcium stone formation) and Struvite (stones resulting from urinary tract infections). My favourite is the mnemonic for the clinical symptoms and signs for hypertension, 'I CHECK A BP' standing for Idiopathic, CNS disorders, High output states, Endocrine diseases, Coarction, Kidney disease, Acute stress, Birth control drugs and Pregnancy. How about the mnemonic for the conditions associated with sexually transmitted diseases 'NO WRAP, U GETS CLAP', standing for NOngonococcal urethritis, Warts, Reiter's syndrome, AIDS, Proctitis, Ulcerative genital lesions, Gonorrhea, Epididymitis, Trichomonas, Syphilis, Cytomegalovirus, Lice, Arthritis and Pelvic inflammatory disease.

Many purists dismiss these acronyms as exercises in idle word play. However, the method is successful because each mnemonic provides a framework to construct the differential diagnosis.

Mental pictures

O'Brien is able to memorise a pack of 52 playing cards in sequence in a staggering 38.29 seconds. He does this by assigning a character to each card and placing them along a familiar mental journey (for example the local golf course), which has 52 landmarks. This journey method is similar to that proposed by the ancient Greeks and

Romans. Marcus Fabius Quintilianus (35–96 AD), the famous Roman author and teacher of rhetoric, described a method in which he attached ideas successively to rooms and ornaments in an imagined house and recall was by mentally walking through the house. This technique was further promoted by Matteo Ricci (1552–1610) an Italian Jesuit missionary who spent much of his life in China where he taught his pupils (among other things) how to improve their memory [3].

A system to memorise pharmacological information based on this concept has recently been proposed in a book entitled *The Phunny Pharm: The Ultimate Pharmacology Study Guide* by Ty Reidhead from the Department of Internal Medicine, University of Colorado Health Sciences Centre (<http://www.uchsc.edu>) [4]. The Phunny Pharm represents the body, with each organ system represented by something that can be visualized within the Phunny Pharm. For instance, the lungs are represented by an airport, with the trachea, bronchi and bronchioles represented by tubes leading to the runways. Drugs administered through the lungs are represented by all things that can fly or can use the airport, and respiratory secretions by rainstorms. In this picture, inflammation of the airway is represented as a fire in the tubes and epithelial damage as the burnt

walls of the tunnel. Corticosteroids are then visualized as fire-fighters extinguishing the fire created by the pyromaniacs (the mediators). In this picture, the fire-fighters can only put out the fire and it takes some time before the tubes can be opened. This represents the delayed onset of activity of the corticosteroids.

In another picture, the antimicrobials are represented as players in a variety of sports, each class being represented by a different sport – the penicillins as players of baseball, the sulphonamides as players of water polo, the aminoglycosides as players of hockey, and so on. In every case, the bacteria are the opponents that the players are facing. Penicillin G is then visualized as a muscular (its route is intramuscular) pitcher who throws fastballs against the GAS man (Group A *Streptococcus*) to set him on fire, and the opponents are associated with the new moccasins (*Pneumococcus*). The penicillinase-resistant penicillins are visualized as the infielders, the extended-spectrum penicillins as the outfielders and clavulanic acid as the umpire.

Of course, pictures do not magically remove the work in learning pharmacology. However, they do make it fun and can enhance recall. I must admit that I was sceptical when I first came across this book but the concept does appear to work!

Final word

Memory and recall are vitally important in our chosen profession as scientists. It is reassuring that, in an age where technical innovation is dominated by increasingly powerful computers providing us with more and more data and information, all we need to be able to remember is a will and a way! The ways are proven and available. But is there a will? I am sure that there is but all of the techniques require practice to perfect and many of us do not have the time available. Now where did I store the file with my original document?

References

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