Here are this week's health care news highlights from AskaPatient:

- MIT develops prosthetic foot that mimics a normal gait and can be tailored to an individual. http://ow.ly/DxAt30kKHQU (07-02-18)

- Magnetic brain stimulation sessions lasting only three minutes are enough to reduce symptoms of depression. http://ow.ly/XUeQ30kKHTd (07-02-18)

- Penn Medicine scientists reveal how “hot” and “cold” cancers differ in their ability to evade the immune system. http://ow.ly/448s30kKLMx (07-02-18)

- Drug stops progression of Parkinson’s in brain cells of mice and is expected to move to clinical trials later this year. http://ow.ly/EanH30kLVfu (07-03-18) (see related article below)

- Compounds found in green tea and red wine could lead to new therapies for metabolic disorders. http://ow.ly/nUnP30kLVfL (07-03-18)

- Chronic pain does not get worse after stopping long-term opioid treatment, and it might even improve. http://ow.ly/sDtV30kLXkA (07-03-18)

- Sitting for long periods during leisure time increases risk of death from all causes, study finds. http://ow.ly/V71C30kN4se (07-04-18)

- Artificial ovaries may provide women who have gone through chemotherapy the chance to conceive. http://ow.ly/ELWt30kN4C1 (07-04-18)

- Expecting a stressful day impacts cognitive abilities, whether or not the day was actually stressful. http://ow.ly/4R3W30kN4MX (07-04-18)

- Maintaining healthy vision may help keep the brain sharp as well. http://ow.ly/CIFs30kO3cj (07-05-18)

- Exposure to paints and other solvents dramatically increases risk of multiple sclerosis. http://ow.ly/bOrp30kO3cx (07-05-18)

- An estimated 4.5 million people died from diseases attributable to air pollution in 2015. http://ow.ly/pSV830kO3jP (07-05-18)

- Johns Hopkins Hospital evacuated due to possible tuberculosis exposure during transport of the bacteria. http://ow.ly/tE0G30kOYvK (07-06-18)

- Web-based support system may help people lose weight and keep it off. http://ow.ly/JRvB30kOYBv (07-06-18)

- Young athletes are more likely to tear an ACL while fatigued; study authors hope to improve training styles with their research. http://ow.ly/YIT530kOYRT (07-06-18)

- Engineers create a smart bandage that monitors chronic wounds and delivers appropriate drug treatments. http://ow.ly/P6AQ30kQbEI (07-07-18)

- Vibrations from driving can lull you into sleepiness after just 15 minutes, even if you are well rested. http://ow.ly/gkji30kQbGp (07-07-18)

From AskaPatient: Parkinson’s disease 50 years after revolutionary treatment discovery: promising research, but levodopa is still “gold standard” treatment

Nobel prize winning pharmacologist Arvid Carlsson, who discovered a revolutionary treatment for Parkinson’s, died June 29 at the age of 95. Here’s a brief history of what led him to the discovery of a treatment for this common and debilitating degenerative neurologic disease.

Discovery of link between low levels of dopamine and Parkinson’s disease

In the mid-1950’s, the Swedish pharmacologist came to the U.S. for a fellowship with Dr. Bernard Brodie at the NIH’s National Heart Institute in Bethesda, Maryland. Brodie was studying the effects of reserpine, a drug used for schizophrenia then and also used for hypertension today. Researchers observed that rabbits treated with reserpine became immobile. Brodie discovered that reserpine depleted serotonin, (a neurotransmitter that is today associated with mood disorders), and assigned Carlsson to study the effect of reserpine on serotonin in blood cells.

By 1956, back in Sweden at the University of Lund, Carlsson continued research on reserpine. He noticed that rabbits’ tremors and muscle rigidity were similar to those of people with Parkinson’s disease. He discovered that not only was serotonin depleted by the reserpine, but

the levels of noradrenaline were also depleted. So Carlsson believed that it was likely to be either the brain's decreased levels of **serotonin** or decreased levels of **noradrenaline** that caused movement disorder. He tried giving the rabbits a drug that would increase the levels of serotonin in the brain, but this had no effect. Then he administered the rabbits with **L-dopa,** a drug that would trigger the synthesis of dopamine and then noradrenaline in the body. The animals' mobility improved, but to Carlsson's surprise, the rabbits' brains had increased levels of **dopamine** in response to the drug, not **noradrenaline**.

This led to Carlsson's discovery that dopamine itself was a **neurotrasmitte**r— a brain chemical that passes signals from one neuron to the next. Carlsson also found that dopamine is concentrated in the **basal ganglia**, an area at the base of the forebrain that mainly controls motor function. These discoveries were breakthroughs for Parkinson's treatments and would help set the direction of many research projects for years to come.

Levodopa helps boost dopamine in the brain

By the 1960's, additional researchers confirmed the connection between low levels of dopamine, cell death in the basal ganglia, and Parkinson's disease. Dopamine is difficult to pass into the brain directly, so must be ingested as a substance that either mimics the effects of dopamine (a "dopamine agonist") or a substance that is changed into dopamine once it crosses the "blood-brain barrier" (a "dopamine precursor"). An example of a drug that mimics the role of dopamine in the brain is Pramipexole (brand name Mirapex).

Levodopa (L-dopa), a "dopamine precursor" approved by the FDA in 1970, is still the most frequently prescribed drug for treating Parkinson's**.** It is combined with carbidopa, an ingredient that delays the conversion of levodopa into dopamine until it reaches the brain, thereby preventing or diminishing some of levodopa's side effect, such as nausea. Every symptom of Parkinson's is not helped by Levodopa, but mobility issues and rigidity symptoms are most likely to be improved .

Unfortunately, many patients will need to gradually increase the dose of Levodopa as the body becomes less responsive to the initial dose over time. This may lead to "drug vacations" whereby a patient stops the drug for awhile so that when the drug is started again, they gain back the stronger symptom relief. Since protein or other foods may interfere with drug absorption, some patients are advised to make dietary changes to improve absorption of the drug.

Parkinson's drugs containing Levodopa: examples and patient reviews

Average Rating	Drug	Ingredient
2.6	SINEMET	(CARBIDOPA; LEVODOPA)
3.6	SINEMET CR (slow release)	(CARBIDOPA; LEVODOPA)
2.5	RYTARY	CARBIDOPA; LEVODOPA
2	CARBIDOPA, LEVODOPA AND ENTACAONE	CARBIDOPA; LEVODOPA

(5 = highly satisfied; 1 = not satisfied)

Link to drug labels, including precautions and dosage information for 89 Levodopa drug products at NIH's Daily Med.

Possible Side Effects of Levodopa:

Nausea
Confusion
Tremor/Dyskinesia
Hallucinations
Sleepiness
Impulse Control

Low Blood Pressure

Sources and More Reading

- Arvid Carlsson, Nobel winning scientist who discovered Parkinson's treatment dies (NY Times): appears in SFGate
- EmedTV article on Parkinson's disease contains history of the disease, medications used, and more.
- Michael J Fox Foundation has descriptions of priority areas of research that they are supporting, including "Convection Enhanced Delivery" (direct method of drug delivery to the brain through special catheters – thereby getting around the blood-brain-barrier obstacle). Other priority research areas include biomarkers, cognition, dyskinesia, imaging, and more.
- Animal Research Success: Parkinson's Disease – discusses levodopa as well as deep brain stimulation as treatments for Parkinson's. From Brainfacts.org
- Recent success with a experimental drug similar in chemistry to diabetes treatment that stops Parkinson's disease progression in mice. Hopkins Medicine

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