

JUNE 2021 MEDICAL NEWSLETTER



SPECIALTY SPOTLIGHT: NEUROLOGY

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Neurology

Sejal Kaushik

One of the biggest fields in the medical field, neurology serves as the study of the nervous system. This includes two distinct parts:

The Central Nervous System

This part of the nervous system refers to the **brain** and **spinal cord**. Our awareness and consciousness is derived from these parts, and they are very complex to understand.

The Peripheral Nervous System

This is everything else. From ears to eyes to sensory nerves, this part of neurology is vast.

A neurologist studies these parts and diagnoses, examines, and treats neurological disorders. **It is important to note that neurologists do not participate in surgical procedures- if they believe a patient requires surgery, they will refer them to a neurosurgeon.**

Common disorders that neurologists treat are Alzheimer's Disease, Amyotrophic Lateral Sclerosis, Parkinson's Disease, Epilepsy, and Autism.

Like other medical professions, since the information required to perform this occupation properly is vast, the road to becoming a neurologist is a long one. A neurologist typically requires:

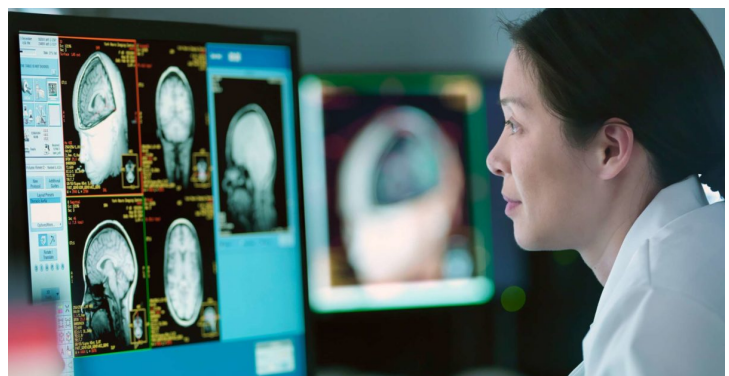
4 years of undergraduate school: During this time, a student completes pre-medical requirements while pursuing their Bachelor's Degree.

4 years of medical school: After taking the MCAT and applying to medical schools, a student is accepted into medical school, where they will study for the next 4 years.

1 year of internship: An intern will practice supervised medicine in their selected field of neurology.

3 years of residency: During their residency, an aspiring neurologist will be involved in patient rounds, lectures, and other aspects of hospital work life.

After completing these stages and receiving their licensing, one can become a neurologist and treat neurological disorders.



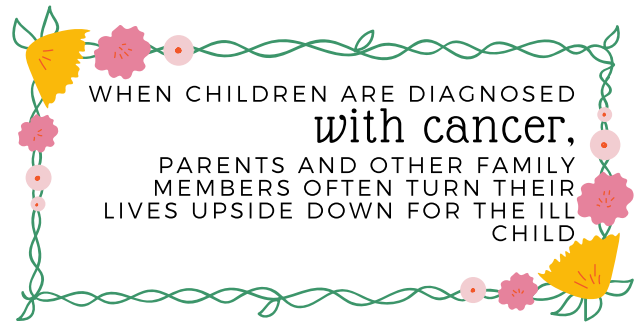
Artificial Intelligence & Collaboration

Ryen Belle Harran

In 2010, the **World Health Organization** published guidelines on collaborative practice, which is defined as “multiple health workers from different professional backgrounds working together with **patients, families, caregivers, and communities** to deliver the highest quality of care.”

Integrating the work of **physician specialists, PA's, nurses, communities, and even lawyers** optimizes healthcare greatly. However, the WHO's 2010 guidelines do not even touch upon the role of **artificial intelligence in collaborative practice**. Earlier this month, researchers from Indiana University-Purdue University Indianapolis (IUPUI) published a position paper on exactly this connection between AI and healthcare.

The researchers, based on their own fieldwork in pediatric cancer, found that AI not only serves as a positive **decision-making** tool in the clinical setting but also supports comprehensive collaboration through **symptom tracking** in the non-clinical setting.



Many AI applications have been set up to assist in making feasible **diagnoses** and track personal informatics such as **heart rate** and **calories**. Nevertheless, the authors of this article note that no AI apps have yet been designed to enhance collaboration between the patient and their caregivers.

When children are **diagnosed with cancer**, parents and other family members often turn their lives upside down for the ill child - while maintaining personal and professional responsibilities - and ultimately become **indispensable keystones** to the child's care.

What if we could make their lives easier? The current state of clinical collaborative practice **calls for AI** to not only provide **information** supporting clinical decisions but also ease and **support family collaboration**.



Which Cancer Research Models are the Best?

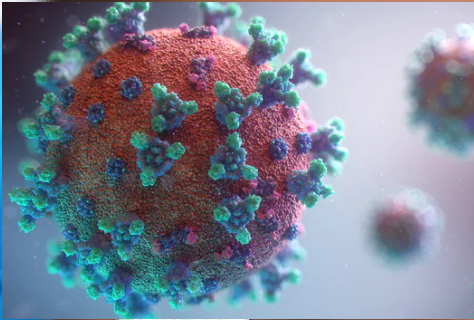
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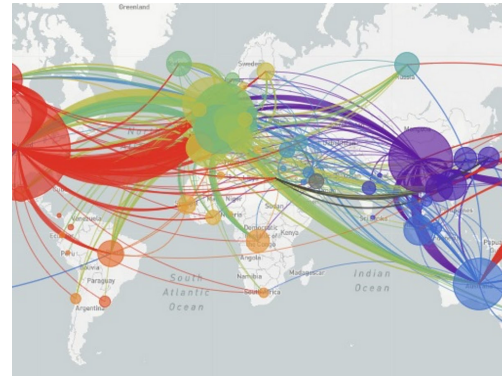
"It may not be a surprise to scientists that cancer cell lines are genetically inferior to other models, but we were surprised that genetically engineered mice and tumoroids performed so very well by comparison" (Patrick Cahan, Ph.D., lead investigator of the new study at Johns Hopkins University)

Cancer is a disease caused by uncontrolled cell growth and can cause severe stress on an individual's body. Although treatments exist to prolong the lives of those affected, there is no cure for this deadly disease. Therefore, there are many cancer research trials to help develop better treatments for patients by studying cancer cells and their responses to various therapeutic measures.

To study cancer cells, research models should be genetically similar to their human sources. CancerCellNet is a computer-based technique that compares RNA sequences of a research model with data from The Cancer Genome Atlas, which consists of RNA expression information from patient tumor samples. According to a study conducted by Johns Hopkins University, genetically engineered mice and tumoroids ("3D balls of human tissue") have RNA sequences that most closely align with the genome data than human cells grown in a dish. Once human cells are grown out of their natural environment, they change because the external environment is different, which makes them not representative of cells in the human body. Furthermore, it is important to understand why RNA was utilized to compare research models and patient samples. Patrick Cahan, the lead investigator, states, "RNA is a pretty good surrogate for cell type and cell identity, which are key to determining whether lab-developed cells resemble their human counterparts...RNA expression data is very standardized and available to researchers, and less subject to technical variation that can confound a study's results."



COVID-19



VARIANTS OF CONCERN

WHO label	Pango lineage	GISAID clade	Nextstrain clade	Earliest documented samples	Date of designation
Alpha	B.1.1.7	GRY	20I/S:501Y.V1	UK, Sept 2020	Dec 2020
Beta	B.1.351	GH/501Y.V2	20H/S:501Y.V2	South Africa, May 2020	Dec 2020
Gamma	P.1	GR/501Y.V3	20J/S:501Y.V3	Brazil, Nov 2020	Jan 2021
Delta	B.1.617.2	G/452R.V3	21A/S:478K	India, Oct 2020	May 2021

Is there another COVID-19 variant?

Sejal Kaushik

To the general public, the terms used to describe the COVID-19 pandemic are confusing. For example, the idea of mRNA technology (the technology used in the vaccines) was a concept that people did not understand easily, as there is a lot of scientific background that needed to be understood. The names of the COVID-19 variants, as another example, were not easily comprehensible by the public either. With names like "501Y.V2," variant names were becoming hard to keep track of, especially with the rise of new variants. Because of this, people often resorted to calling these variants by the location that they were first discovered in- for example, the 501Y.V2 variant was referred to as the South African variant, which does nothing but promote geographical stigmas. In response to this, the World Health Organization has now established Greek names for the variants. The variant that had, and continues to, devastate India is called the Delta variant. Recently, officials have discovered another version of the deathly Delta variant- Delta Plus. This version has been identified in 11 countries, including the United States. Worldwide, there are almost 200 cases of this version that have been identified. Although this is concerning, officials say that Delta Plus is unlikely to become a dominant strain and will likely not change anything majorly. Research done on other variants will help to study this one, and at this point, all we can do is get vaccinated to protect ourselves and our community against the virus.



Have You Laughed Today?

There are more health benefits to a good chuckle than you might think...

Rebecca Ince

They say that laughter is the best medicine.

But how much truth does that hold? According to research, a hefty guffaw has a many rewarding effects on your health.

You know the feeling, the one that comes when you've heard a joke from a friend that might not even be that funny, but you get an instant boost of serotonin and before you know it... you're off with the giggles. This article examines why you should laugh just a little more often.

Stress Relief

Laughter has been found to be an effective stress reliever. Geisenger writes that laughing releases endorphins, which is your happy hormone and aids in stress relief. The American Physiological Society reported that laughing reduces levels of three harmful stress hormones. Cortisol (your stress hormone), epinephrine (adrenaline) and dopac (the catabolite of your happy hormone, dopamine) were reduced **39, 70** and **38%** when laughter was present.

Improved Immune System

The Mayo Clinic states that a good laugh can improve your immune system! Science Daily also shares research that found that laughter secretes the Human Growth Hormone (HGH) as well as endorphins. Research shows that those hormones increased by 27% and 87% in subjects who watched a funny video. For participants who didn't watch a funny video, there was no increase.

Pain Relief

It has been found that getting in a good laugh can aid in relieving pain. The Mayo Clinic writes:

“Laughter may ease pain by causing the body to produce its own natural painkillers.”

So what do you think? Are you ready to turn up the laughter? You've got some phenomenal benefits in store when you do. Get a laugh in today, your body will thank you.

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