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Swasti Sri DURMUKHI (దుర్ముఖి) Year, **PUSHYA** Month
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BENEFITS OF EXERCISE[2]

Some of the benefits of daily exercise:

- The brain's limbic system processes a vast majority of emotions, memories, and a range of functions from breathing and sexual satisfaction to hunger and emotional response. It is rich in opioid receptors. Certain stimuli, stress, fear, and pain produce endorphins. Endorphins produced during exercise stay for approximately 2 hours after exercise, and interact with the receptors in the brain that reduces the perception of pain and trigger a positive feeling in the body reducing stress after exercise, creating the feelings of pleasure and satisfaction.
- Cardiovascular exercises increase in cardiovascular endurance.
- Stretching and strength training Increase in flexibility and muscular strength. A stretching session and meditation get the blood flowing to the brain to wake it up and ward off depression.
- Blood pressure, heart rate, and blood sugar all decrease after exercise.
- Yoga, Taichi, core strengthening, stretching, and strength training improve balance.
- Exercise in the morning improves energy throughout the day and helps people with their eating habits.
- Afternoon/ lunch break exercise boosts work productivity afterward.
- Evening exercise can burn off some steam of the day and bring your workout to a higher intensity level. Working out in the evening can also lead to a more restful night's sleep. Blood glucose drops during the exercise and continues to drop for about two hours leading to overeating at or after dinner. Therefore, after evening/night exercise, it is recommended to ingest a mixture of complex carbohydrates and lean protein, along with water to replace fluids. Diabetics should consult with a doctor.
- During the cold winter season, keeping the house colder may ward off extra pounds by burning off fat to keep the body warmer.

BREAKTHROUGH PRIZE AND NEW HORIZONS

Breakthrough Prize and its initiatives are a program of scientific and technological exploration, probing the big questions of life in a Universe that is vast and expanding ever faster, perhaps toward infinity, the Universe circling one star among hundreds of billions, in one galaxy among a hundred billion more[3]. The fifth year of Breakthrough Prizes to outstanding scientists in the areas of Life Sciences, Fundamental Physics and Mathematics were awarded by the founders[4] Sergey Brin and Anne Wojcicki, Yuri and Julia Milner, and Mark Zuckerberg and Priscilla Chan. Each of the Breakthrough Prizes is worth $3 million. Milner and his wife fund the prize along with Facebook founder Zuckerberg and his wife, Priscilla Chan, and Google co-founder Sergey Brin, and 23andMe chief executive officer Anne Wojcicki. The gala, held in Silicon Valley, was hosted by Morgan Freeman on December 4, 2016. The five 2017 Breakthrough Prize in Life Sciences winners were Stephen Elledge, Harry Noller, Roeland Nusse, Yoshinori Ohsumi, and Huda Yahya Zoghbi. New Horizons in Physics Prize awarded to Asimina Arvanitaki, Peter W. Graham, and Surjeet Rajendran; Simone Giombi and Xi Yin; and Frans Pretorius New Horizons in Mathematics Prize awarded to Mohammed Abouzaid, Hugo Deuminil-Copin, and Benjamin Elias and Geordie Williamson Second Annual, International Breakthrough Junior Challenge Won by Female Students Antonella Masini, 18 (Peru) and Deanna See, 17 (Singapore). 2016 Special Breakthrough Prize in Fundamental Physics, awarded in May to founders and team members of LIGO, awarded to Kip Thorne, Rainer Weiss and family of Ronald Drever. The highlights included the speeches by the two female students who won the Breakthrough Junior Challenge, Antonella Masini, 18 (Peru) and Deanna See, 17 (Singapore)[5].

HORMONES INFLUENCE WOMEN

A new study from the Norwegian University of Science and Technology (NTNU) and the University of New Mexico journal Evolution & Human Behavior explains why unlike most animals that periodically come into heat, humans are constantly interested in sex, and posits that sex is important for pair-bonding between men and women in relationships. Women who have more sex with their partners are either in long-term relationships or using hormonal contraception. Hormonal contraceptives like pills, implantable rods, and patches contain two types of hormones: estrogen and progesterone. Estrogen naturally peaks just before ovulation when naturally cycling women can conceive offspring and progesterone naturally peaks during the time when no conception occurs. The levels of each hormone type vary in different contraceptives. Some contraceptives mimic hormones that cause ovulation, whereas others mimic hormones that disrupt ovulation. Often, women have sex when committed to their partner or when they have more estrogen, whether natural or synthetic.

PHARMACIST ROLE

In Illinois, pharmacies are required to provide patients with an "offer to counsel" on all prescriptions. Pharmacies often address this requirement by having staff ask customers at checkout, "Do you have any questions for the pharmacist today?" or sometimes simply, "Any questions?"

A Tribune investigation published online Thursday found that Chicago-area pharmacies frequently dispense dangerous drug combinations without warning patients. Of the 255 drugstores tested by the newspaper, 52 percent sold risky drug pairs without mentioning the potentially harmful or even fatal interactions.

"It's hard for me to believe that, in this age of computers and software, we would still be dealing with such a fundamentally dangerous issue," Durbin said in an interview. However, instead of asking the proper question "who prescribed the potentially harmful combination of drugs to a patient?", both the Chicago Tribune and Mr. Durbin find fault with the pharmacist.

According to the American Association of Colleges of Pharmacy[6], Pharmacists are trained to be essential healthcare professionals, who enhance patient care and promote wellness. "While responsibilities vary among the different areas of pharmacy practice, the bottom line is that pharmacists help patients get well.
Pharmacists:

- Are trained in colleges of pharmacy which are centers of academic excellence, scientific research and innovation.

- Are the medication specialists on the healthcare team.
- Work in a wide range of healthcare settings and have flexible hours.
- Are accessible to talk to face-to-face without an appointment.
- Play an important role in helping people get the best results from their medications.
- Communicate effectively to evaluate factors that may affect a patient's ability to take a medication.
- Help outcomes improve and costs decline when involved in patient care.
- Help people live healthier, better lives.

"Pharmacist responsibilities include a range of care for patients, from dispensing medications to monitoring patient health and progress to optimize their response to medication therapies. Pharmacists also educate patients on the use of prescriptions and over-the-counter medications, as well as provide population based care in institutional settings. Pharmacists educate and advise physicians, nurses, and other health professionals on medication therapy decisions. Pharmacists also provide expertise about the composition of drugs, including their chemical, biological, and physical properties and their manufacture and use. They ensure drug purity and strength and make sure that drugs do not interact in a harmful way. Pharmacists are medication experts ultimately concerned about their patients' health and wellness[7]."

But, they do not diagnose diseases and prescribe medications. That is the job of a physician or a specialist physician trained in a particular area of healthcare. If a physician prescribes wrong combination, the pharmacists role is to educate the patient and alert the physician who prescribed the adverse combination.

The physician supposedly spends hours discussing with the patient in view of test results and data, and prescribes the medication explaining the side effects and bad combinations to the patient, with caution not to use bad combinations.

"Where's the safety for the consumer?[8]" Here the consumer is a patient taken care of by the primary physician and one or more specialists. The safety for the patient is in the hands of the physician and the specialist, not in the hands of a pharmacist who dispenses the medication as prescribed by the physician and explains the same information that was and should be given by the physician before prescribing the medication.

A physician's role[9] can be divided into 5 general areas:

1. The physician takes medical histories and performs a physical examination to assess the patient to determine a possible diagnosis for both acute and chronic conditions. Diagnosis is a key feature of a physician's expertise in medical practice and is based on strong assessment skills. Diagnosis is a core cognitive skill, based on both knowledge and judgment.

2. The physician provides continuous care for the patient while in the hospital or ambulatory setting. They manage and treat a variety of medical conditions from minor cuts to mental health to palliative care to surgery. They are required to manage complexity and risk in situations that often times are uncertain and changing.
3. The physician works collaboratively with the healthcare team to provide optimal care. This includes providing referrals to other practitioners or services that the patient may need. They provide reports and updates of patient's condition and needs to other services such as physical therapy, home health services, and other specialists
4. The physician provides education to patients, families and support staff as it relates to the patient condition, diagnosis and treatment. The physician will offer resources with information and research that patients can use to make informed decisions about their treatment plan. The physician will often teach medical students, residents, physician's assistants, advanced practice nurses, and others about their area of expertise as well.
5. The physician plays a very important role as an advocate for patients and families. They help the patient navigate through a complex medical system to be able to obtain the most patient-centered care in a cost-effective manner. The physician works to identify and meet the needs of the individual patient, the practice population, and the community by working with a variety of partners in the community, public health sector and hospital system.

The physician's responsibilities[10] include:

- diagnosing diseases and accepting the sole responsibility for the diagnosis;
- assessing the need for medicinal therapy and prescribing the relevant medicines;
- providing information to patients about diagnosis, indications and treatment goals;
- monitoring response to medicinal therapy and when necessary revising the therapeutic plan;
- maintaining adequate records;

The pharmacist's responsibilities include:

- ensuring safe procurement, adequate storage and dispensing of medicines;
- providing information to patients on a medicine's interactions and side effects;
- reviewing prescription orders to identify interactions, allergic reactions, contraindications and discussing concerns with the physician;
- discussing medicine-related problems with the patient;
- advising patients on non prescription medicines;
- reporting adverse reactions.

What do patients want from their physicians[11]? What do patients want from their pharmacists?

A silly experiment to conduct is to walk like a Tribune reporter walked into an Evanston CVS pharmacy carrying two prescriptions: clarithromycin and simvastatin to be taken together, a common antibiotic and a popular anti-cholesterol drug. And ask the wrong questions and hold wrong professionals to hold responsible for the prescription.

Clarithromycin and simvastatin taken together can cause a severe breakdown in muscle tissue and lead to kidney failure and death. So, who is responsible for the prescription, the dispenser or the prescriber?

Is there a very high sense of urgency to pursue this issue and get to the root cause: the prescriber-Physician or the dispenser-pharmacist[12]? Or is this simply an exercise in public to grab attention and find scapegoats?

RISING SEA LEVEL

The land-to-water ratio on the planet Earth is about 29 percent land to 71 percent water, according to the US Geological Survey[13]. However in terms of mas, scientists calculate that the oceans on Earth weight about 1.35 x 1018 metric tons (1.488 x 1018 US tons), which is the equivalent of 1.35 billion trillion kg, or 2976 trillion-trillion pounds. This is just 1/4400 the total mass of the Earth, which means that while the oceans cover 71% of the Earth's surface, they only account for 0.02% of our planet's total mass[14]. The simple reason for water being only0.02% of the mass to cover the 71% of the surface of the earth is the density of water (since rocky material with higher density cannot float in water[15]). Therefore, water covers 71% of the earth's surface, most of it, about 96.5 percent, is saline water contained in the oceans absorbing more than 90% of the atmospheric heat (or at least 71% based on the surface area).

Global sea level has been rising at an increasing rate since the 20th century. Analysis of a global network of tide gauge records shows that sea level has been rising at the rate of about 0.6 inches per decade since 1900. Since 1992, satellite altimeters indicate that the rate of rise has increased to 1.2 inches per decade—a significantly larger rate than at any other time over the last 2000 years. In the next several decades, continued sea level rise and land subsidence will cause tidal flood frequencies to rapidly increase due to typical storm surges and high tides in many coastal regions[16].

There are a number of factors that contribute to long and short-term variations in sea level. Short-term variations generally occur on a daily basis and include waves, tides, or specific flood events, such as those associated with a winter snow melt, or hurricane or other coastal storm. Long-term variations in sea level occur over various time scales, from monthly to several years, and may be repeatable cycles, gradual trends, or intermittent anomalies. Seasonal weather patterns, variations in the Earth's declination, changes in coastal and ocean circulation, anthropogenic influences (such as dredging), vertical land motion, and the *El Niño* Southern Oscillation are just a few of the many factors influencing changes in sea level over time. When estimating sea level trends, a minimum of 30 years of data are used in order to account for long-term sea level variations and reduce errors in computing sea level trends based on monthly mean sea level. Accounting for repeatable, predictable cycles, such as tidal, seasonal, and inter-annual variations allows computation of a more accurate long-term sea level trend[17].

The two major causes of global sea-level rise are thermal expansion caused by warming of the oceans (since water expands as it warms) and the loss of land-based ice, such as glaciers and ice sheets, due to increased melting (since ice melted from polar caps and mountains flows into the sea, naturally).

At least 5 islands across the northern Solomon Islands have totally disappeared over recent decades and 6 islands are currently experiencing severe erosion[18]. However, the limited research on reef islands in the

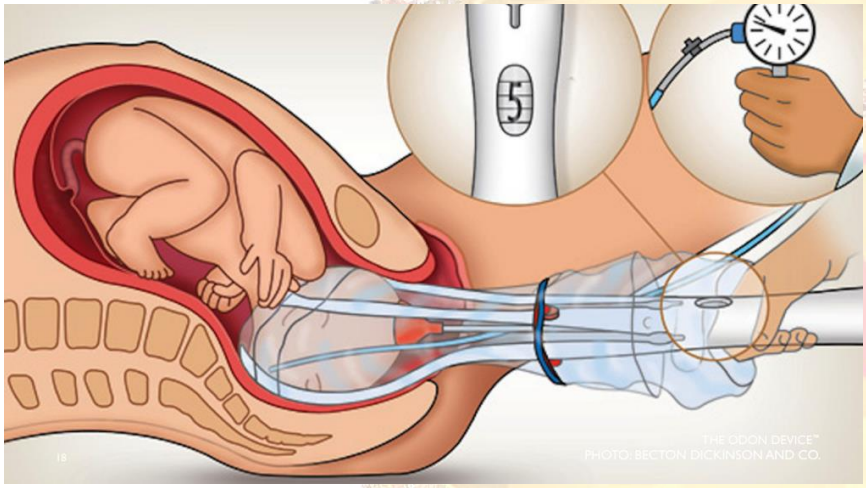
western Pacific indicates the majority of shoreline changes and inundation to date result from extreme events, seawalls and inappropriate development rather than sea-level rise alone. Relative sea-level rise can also be the result of tectonics, the Solomon Islands are in a particularly tectonically active part of the globe with the convergence of the Pacific Plate, Solomon Arc block and Australian Plate causing localized crustal deformations manifesting as either island subsidence or uplift. The large range of erosion severity on the islands in this study highlights the critical need to understand the complex interplay between the projected accelerating sea-level rise, other changes in global climate such as winds and waves, and local tectonics, to guide future adaptation planning and minimize social impacts.

The Marshall Islands Are Disappearing[19]. The United States military detonated 67 nuclear bombs on Bikini Atoll and Enewetak Atoll, and established a fund to support Bikini Islanders as long as they continued to live in the Marshall Islands. However, now the Bikini Islanders want to use that fund to move to the United States. The Marshall Islands' strategic value to the United States no longer rests on the Pacific nuclear testing grounds. But Kwajalein, the largest of the Marshall atolls, is home to the Ronald Reagan Ballistic Missile Defense Test Site. The 1,200 Americans who live on the base launch missiles, operate space weapons programs and track NASA research, supported by an annual budget of $182 million. About 900 Marshallese workers take a ferry to the base every day to support them. The island's dying breadfruit crop and the concrete ways that rising sea levels are affecting lives of islanders and their economic growth. However, their plight raise only unsympathetic response of "**So what?"** from folks who reject Global Warming.

GRAND CHALLENGE[20]

Every two minutes, a woman dies in childbirth. The onset of labor marks the start of a high-risk period for both mother and baby that does not ease until at least 48 hours after birth. Almost all the deaths during this high-risk period occur in low- and middle-income countries.

Through Grand Challenge programs, hackathons and other forms of open innovation, brightest minds across the globe are tackling global health challenges head on, thinking of innovative, creative, and multi-disciplinary ways to address age-old challenges in health. Grand Challenges call on the. These Grand Challenges demonstrate the power of open innovation.



Many discoveries are serendipitous. An idea came to Jorge Odón in his dream leaping from a YouTube video on extracting a lost cork from a wine bottle to the realization that the same trick could save a baby stuck in the birth canal. Mr. Odón, an Argentine car mechanic, built his first prototype using a glass jar, doll, and handmade fabric sleeve.

With support from the World Health Organization and Saving Lives at Birth, the Odon Device[21] will be the first innovation for obstructed labor since the vacuum extractor decades ago. Becton, Dickinson, and Company has now licensed the product and will launch the Odon DeviceTM in more than 50 countries impacting 10 million births around the world.

Assisted vaginal birth usually involves a forceps or a suction cup. A pair of spoon-shaped surgical tongs are inserted into the vagina and applied to the sides of the baby's head. During contractions, the obstetrician grasps the handles and gently pulls the baby down and out of the birth canal while the mother pushes the baby out. The baby may be slightly bruised from the forceps, but the bruises usually clear up in a few days. Forceps delivery increases the risk of tears in the cervix, vagina, perineum, and anal sphincter.

The practitioner may apply a flexible, rounded cup to the baby's head in the birth canal. The cup is connected to an electric suction pump or a small handheld pump that creates vacuum pressure to hold the cup securely

to the baby's head. Mother will be asked to push while the doctor gently pulls on a handle attached to the cup, to help move the baby down and out of the birth canal. A baby born with the help of a vacuum may have a raised bruise (called a cephalohematoma) on the top of his head. The bruise usually goes away within a few weeks, though it may take longer. Having a vacuum-assisted delivery increases mother's risk of tears in your vagina, perineum, and anal sphincter, though less so than with a forceps delivery.

The Odón Device is designed to be used in both high- and low-resource settings. Using the device, health care workers can assist delivery with less specialized training than they would need to use forceps or vacuum extraction. The Odón Device is the first real innovation in the area of assisted vaginal delivery in more than 50 years and may positively impact an area of maternal and neonatal health that has not seen significant improvement in some time. Although production costs for the device have not yet been estimated, the disposable sleeve is likely to cost less than $1. Even with the added costs of the inserter and hand pump, the Odón Device is projected to be a more affordable option for assisted delivery than VEs or forceps. The Odón Device has received a $250,000 grant as a winner of the Saving Lives at Birth's Grand Challenges program as well as $50,000 as a first prize winner at the competition for technological innovation, INNOVAR 2011[22].

REFERENCES AND NOTES[23]

[1]Dr. Rao Vepachedu is the founder and president of Vepachedu Educational Foundation Inc., a 501(c) (3) educational foundation, and the Law Offices of Dr. Vepachedu and co-founder of Exciva. For more information visit: www.linkedin.com/in/vepachedu; http://www.avvo.com/attorneys/60201-il-sreenivasarao-vepachedu-764535.html, and http://www.crm-ip.com/vepachedu.html. Contact: svepachedu@yahoo.com.

[2] What Are Endorphins?

When's the best time of day to exercise?

What Are the Psychological Benefits of Exercise With Depression?

5 ways to improve your balance

3 simple tips to make your mornings easier

[3] Breakthrough Initiatives

[4] https://breakthroughinitiatives.org/Board

[5] BREAKTHROUGH PRIZE MARKS 5TH ANNIVERSARY CELEBRATING TOP ACHIEVEMENTS IN SCIENCE AND AWARDS MORE THAN $25 MILLION IN PRIZES AT GALA CEREMONY IN SILICON VALLEY

[6]Role of a Pharmacist: http://www.aacp.org/resources/student/pharmacyforyou/Pages/roleofapharmacist.aspx

[7] Role of a Pharmacist: http://www.pharmcas.org/preparing-to-apply/about-pharmacy/role-of-a-pharmacist/

[8] After Tribune investigation, Durbin pushes interactive drug protection for consumers: http://www.chicagotribune.com/news/watchdog/druginteractions/ct-drug-interactions-durbin-pharmacy-20161216-story.html

[9] Physician Role: http://www.healthipe.org/healthcare-roles/physician

A Physician's Role in Team-Based Patient Care: http://www.physicianspractice.com/blog/physicians-role-team-based-patient-care

The Role of the Physician in Society: https://med.stanford.edu/content/dam/sm/bioethics/documents/arts/H%26P_journals/Summer07PDR.pdf

'Physician' is a Broad Description for Many Roles: http://www.physicianspractice.com/great-american-physician-survey/physician-broad-description-many-roles

[10] The Responsibilities Of Physicians And Pharmacists: http://www.wma.net/en/40news/20archives/1999/1999_02/

The role of the physician in the emerging health care environment: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1304975/; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1304975/pdf/westjmed00332-0038.pdf

[11] The doctor-patient relationship: challenges, opportunities, and strategies: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1496871/pdf/jgi_267.pdf

[12] Pharmacies miss half of dangerous drug combinations:

http://www.chicagotribune.com/news/watchdog/druginteractions/ct-drug-interactions-pharmacy-met-20161214-story.html

[13] WHAT PERCENT OF EARTH IS WATER? http://www.universetoday.com/65588/what-percent-of-earth-is-water/

[14] *id*

[15] The Crow and the Pitcher (From ***Vishnu Sharma*'s Sanskrit Original, The Panchatantra** (Later Aesop's Fables)): A thirsty crow came upon a pitcher with some water at the bottom and could not reach far enough down to get it. The thirsty crow took a pebble at a time and dropped it into the pitcher until the water reached the beak to quench the thirst. In this context, ***the moral of this ancient Indian fable is that water is lighter than pebbles and even a crow knew that fact in the 3rd or 5th century BCE! The Panchatantra is a series of fables, each fable with a moral to teach.***

[16] Is sea level rising? Sea level is rising at an increasing rate. http://oceanservice.noaa.gov/facts/sealevel.html

[17] What is Sea Level? https://tidesandcurrents.noaa.gov/sltrends/faq.htm#q1

[18] Interactions between sea-level rise and wave exposure on reef island dynamics in the Solomon Islands: http://iopscience.iop.org/article/10.1088/1748-9326/11/5/054011/pdf

[19] The Marshall Islands Are Disappearing; Rising seas are claiming a vulnerable nation: http://www.nytimes.com/interactive/2015/12/02/world/The-Marshall-Islands-Are-Disappearing.html?_r=0

[20] CENTER FOR ACCELERATING INNOVATION AND IMPACT (CII): https://www.usaid.gov/cii

[21] A new, simple, low cost instrument for assisted vaginal delivery: http://www.odondevice.org/

[22] INNOVAR website: http://www.innovar.gob.ar/concurso/ganadores.

[23] In addition to the primary sources cited above, additional references include: http://www.healthcentral.com/chronic-pain/c/5949/135331/fibromyalgia/

New York Times, Washington Post, Mercury News, Bayarea.com, Deccan Chronicle, the Hindu, Hindustan Times, Times of India, AP, Reuters, AFP, The Guardian, Pravda, Spiegel, Connexion, etc.

Disclaimer All information is intended for your general knowledge only and is not a substitute for medical advice or treatment for special medical conditions or any specific health issues or starting a new fitness regimen.

"Where the mind is without fear and the head is held high, Where knowledge is free Where the world has not been broken up into fragments, By narrow domestic walls." Rabindranath Tagore (1861-1941), Gitanjali, 1912.

One World One Family

AUM! SWASTI!

Om! Asatoma Sadgamaya, Tamasoma Jyotirgamaya, Mrityorma Amritamgamaya, Om Shantih, Shantih, Shantih!
(Aum! Lead the world from wrong path to the right path, from ignorance to knowledge, from mortality to immortality, and peace!)

SWASTI! AUM!