SR. No	Area of Learning Goal & Brief Information
1	**CLINICAL RESEARCH:** Clinical research is a branch of healthcare science that determines the safety and effectiveness (efficacy) of medications, devices, diagnostic products and treatment regimens intended for human use. These may be used for prevention, treatment, diagnosis or for relieving symptoms of a disease. Clinical research is different from clinical practice. In clinical practice established treatments are used, while in clinical research evidence is collected to establish a treatment. The term "clinical research" refers to the entire bibliography of a drug/device/biologic, in fact any test article from its inception in the lab to its introduction to the consumer market and beyond. Once the promising candidate or the molecule is identified in the lab, it is subjected to pre-clinical studies or animal studies where different aspects of the test article (including its safety toxicity if applicable and efficacy, if possible at this early stage) are studied. Clinical research is often conducted at academic medical centers and affiliated research study sites. These centers and sites provide the prestige of the academic institution as well as access to larger metropolitan areas, providing a larger pool of medical participants. These academic medical centers often have their internal Institutional Review Boards that oversee the ethical conduct of medical research. The clinical research ecosystem involves a complex network of sites, pharmaceutical companies and academic research institutions. This has led to a growing field of technologies used for managing the data and operational factors of clinical research. Clinical research management is often aided by e-Clinical systems to help automate the management and conducting of clinical trials.
2	**HEALTH EDUCATION :** Health education can be defined as the principle by which individuals and groups of people learn to behave in a manner conducive to the promotion, maintenance, or restoration of health. Health Education also defined as "any combination of planned learning experiences based on sound theories that provide individuals, groups, and communities the opportunity to acquire information and the skills needed to make quality health decisions." Provision of evidence-based information to the stakeholders is first step towards desired healthcare. Health education is essential for understanding the needs, developing, promoting and sustaining compliant behaviours for building healthy populations. The health education needs varies with geographies, gender, age, education etc. The

	strategies to communicating need for health education to priority populations needs to be properly understood to be effective and result in meaningful outcomes. The SIP for health education programme will focus on understanding the needs, modalities of health education and appropriateness of these modalities in different context through field exercise/study. The purpose and approach of health education has evolved over time. From the late nineteenth to the mid-twentieth century, the aim of public health was controlling the harm from infectious diseases, which were largely under control by the 1950s. The major recent trend regarding changing definitions of school health education is the increasing acknowledgement that school education influences adult behaviour.
3	**NATUROPATHY :** Naturopathy is the most ancient health care mechanism that amalgamates modern scientific knowledge with traditional and natural forms of medicine. Relying on the healing power of nature, Naturopathy stimulates the human body's ability to heal itself. It is the science of disease diagnosis, treatment, and cure using natural therapies including dietetics, botanical medicine, homeopathy, fasting, exercise, lifestyle counseling, detoxification, and chelation, clinical nutrition, hydrotherapy, naturopathic manipulation, spiritual healing, environmental assessment, health promotion, and disease prevention. The technique of Naturopathy was brought to the United States in the 1800s from Germany. The term Naturopathy was tossed by John Scheel in 1895 and was popularized by Benedict Lust. Known as the father of modern-day Naturopathy, he also got appreciated for disseminating the knowledge of Naturopathy in the US in 1992. The Naturopathy movement was initiated in Germany and other western countries with water cure therapy which is also called Hydrotherapy. Vincent Priessnitz was the one who made Water Cure famous in the world and later on, some more personalities made their contribution to this work. Louis Kuhne deserves a special mention in this regard as he coined the principle of the Unity of Diseases and Treatment and also gave a theoretical base to this method. In India, revival of Naturopathy took place with the translation of Germany's Louis Kuhne's book ''New Science of Healing''. The translation was done in the Telugu language by Shri D. Venkat Chelapati Sharma in 1894. Afterward, it was translated into Hindi and Urdu languages in 1904 by Shri Shroti Kishan Swaroop. All the efforts hugely gave Naturopathy a wide propagation.

4	**YOGA :** Yoga is an ancient and complex practice, rooted in Indian philosophy. It began as a spiritual practice but has become popular as a way of promoting physical and mental well-being. Although classical yoga also includes other elements, yoga as practiced in the United States typically emphasizes physical postures (asanas), breathing techniques (pranayama), and meditation (dyana). There are many different yoga styles, ranging from gentle practices to physically demanding ones. Differences in the types of yoga used in research studies may affect study results. This makes it challenging to evaluate research on the health effects of yoga. Yoga and two practices of Chinese origin—tai chi and qi gong—are sometimes called "meditative movement" practices. All three practices include both meditative elements and physical ones. Yoga Sanskrit: □□□, is a group of physical, mental, and spiritual practices or disciplines which originated in ancient India and aim to control (yoke) and still the mind, recognizing a detached witness-consciousness untouched by the mind (Chitta) and mundane suffering (Duḥkha). There is a wide variety of schools of yoga, practices, and goals in Hinduism, Buddhism, and Jainism, and traditional and modern yoga is practiced worldwide.
5	**MEDICAL ONCOLOGY :** Medical oncology is a type of medicine that focuses on the diagnosis, treatment, and prevention of cancer. A medical oncologist's job is to take care of cancer patients by using things like chemotherapy, hormone therapy, targeted therapy, or immunotherapy. A medical oncologist will work with other doctors to create a treatment plan that's best for you. They'll explain your cancer diagnosis to you, including the type and what stage you have. They'll also help you manage your cancer symptoms and treatment side effects. You'll probably see a medical oncologist right after you've been diagnosed with cancer. This is usually one of the first steps of your cancer journey. They can help you understand your diagnosis as well as the timeline of your cancer treatment. You'll also want to see a medical oncologist for any questions you might have. You may also see other oncologists depending on the type of cancer you have and what sort of a treatment plan you want. There are three main types:

	A medical oncologist will treat your cancer with chemotherapy, hormone therapy, targeted therapy, or immunotherapy. A radiation oncologist will treat your cancer with radiation therapy. A surgical oncologist uses surgery to remove tumors. They also perform biopsies, where they'll remove a tiny piece of tissue so they can test it.
6	**GENETIC HEALTH:** Medical genetics is a rapidly progressing field in medical science and healthcare with huge scope for its application. The overall incidence of genetic diseases is estimated to be about 3-4% of the newborns, causing a very big health care and financial burden. The available Human resources in dealing with the situation are very scarce in our country. Genetic Health and Research Centre has been serving the patients and families with genetic disorders in Maharashtra since 2003. Is providing genetic health assessment, genetic counseling, prenatal genetics testing, premarraige counseling, chromosomal testing, gene testing, DNA finger-printing and education in the area of medical genetics Genetic testing is a type of medical test that identifies changes in genes, chromosomes, or proteins. The results of a genetic test can confirm or rule out a suspected genetic condition or help determine a person's chance of developing or passing on a genetic disorder. More than 77,000 genetic tests are currently in use, and others are being developed. Genetic testing involves looking for changes in:Genes: Gene tests study DNA sequences to identify variations (mutations) in genes that can cause or increase the risk of a genetic disorder. Gene tests can be narrow or large in scope, analyzing an individual DNA building block (nucleotide), one or more genes, or all of a person's DNA (which is known as their genome). Chromosomes: Chromosomal genetic tests analyze whole chromosomes or long lengths of DNA to see if there are large genetic changes, such as an extra copy of a chromosome, that cause a genetic condition. Proteins: Biochemical genetic tests study the amount or activity level of proteins or enzymes; abnormalities in either can indicate changes to the DNA that result in a genetic disorder.

7	**NUTRITION:** Nutrition is the biochemical and physiological process by which an organism uses food to support its life. It includes ingestion, absorption, assimilation, biosynthesis, catabolism and excretion. The science that studies the physiological process of nutrition is called nutritional science. Nutrients are substances used by an organism to survive, grow, and reproduce. The seven major classes of relevant nutrients for animals (including humans) are carbohydrates, dietary fiber, fats, proteins, minerals, vitamins, and water. Nutrients can be grouped as either macronutrients (carbohydrates, dietary fiber, fats, proteins, and water needed in gram quantities) or micronutrients (vitamins and minerals needed in milligram or microgram quantities). Human nutrition deals with the provision of essential nutrients from food that are necessary to support human life and good health. In humans, poor nutrition can cause deficiency-related diseases such as blindness, anemia, scurvy, preterm birth, stillbirth and cretinism, or nutrient excess health-threatening conditions such as obesity and metabolic syndrome; and such common chronic systemic diseases as cardiovascular disease, diabetes, and osteoporosis. Undernutrition can lead to wasting in acute cases, and stunting of marasmus in chronic cases of malnutrition.
8	**RESEARCH METHODOLOGY :** The revised curriculum designs by NMC and UGC mandates Research Methodology as an essential component across courses. Research is essential to develop an inquisitive mind and add new contributions to the existing knowledge, thereby enhancing the quality of human life. The student of any field needs to be well versed with the basics of Research including scientific techniques and designs and its applications. Research Methodology a science of studying how research is to be carried out. Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology. The SIP for Research methodology programme will focus on how to conduct the scientific study starting from framing of SMART objectives to identifying the suitable design and analysing data through field exercise/study.

9	**BIOMETRY:** "Scheimpflug photography is a precise technique for light scattering measurement and biometry in the anterior segment of the eye. This technique can be included in toxicological studies, not to replace slit-lamp examination and not to provide only photographic documentation, but rather to obtain density and biometry data. Scheimpflug photography is mainly used to investigate the cornea and the lens. The animals need to be sedated and the pupils should be dilated. As with most of the specific investigations, having baseline measurements and at least a final examination at the end of the dosing period is helpful Standard biometry will be inaccurate in patients who have undergone previous corneal refractive surgery. IOL power can be determined using three alternative methods: 1. Refractive history technique: Must have prerefractive surgery K values and refraction. Effective corneal power, K (D) for use in IOL power calculations is derived as follows: a . Calculate pre- and postprocedure refraction spherical equivalent at the corneal plane using: RC = Rs / (1 – BVD × Rs) where RC = Refraction at corneal plane (D), Rs = Refraction at spectacle plane (D) And BVD = Back vertex distance (m). b. Determine change in refraction at the corneal plane by subtracting adjusted postprocedure refraction from adjusted preprocedure refraction. Take care with plus and minus signs. c. Effective corneal power,K(D) = Prerefractive surgery average K-value (D) + (Change in refraction at corneal plane).
10	**MEDICAL TECHNOLOGY:** Medical technology has a major strategic factor in positioning the hospital and its perception in the competitive environment of healthcare providers. Numerous dazzling new biomedical devices and systems are continuously being introduced. They are being introduced at a time when the pressure on hospitals to contain expenditures is mounting. Therefore, forecasting the deployment of medical technology and the capacity to continuously evaluate its impact on the hospital require that the hospital be willing to make the commitment and to provide the support such a program. An in-house "champion" is needed in order to provide the leadership that continuously and

	objectively plans. This figure might use additional in-house or independent expertise as needed. To focus the function of this program in large, academically affiliated, and government hospitals, the position of a chief technology officer (CTO) is becoming justifiable. While executives have traditionally relied on members of their staffs to produce objective analyses of the hospital's technological needs, they nevertheless are too often subjected to the biases of various interest groups, including marketing and vendor appeals. More than one executive has made a purchasing decision for biomedical technology only to discover later that some needed or expected features were not included with the installation or that those features were not yet approved for delivery. These features have come to be known as "futureware" or "vaporware." Or, alternatively, it may be discovered that the installation has not been adequately planned, ending therefore as a disturbing, unscheduled, expensive, and long undertaking.
11	**SOCIAL COMMITMENT:** Social responsibility is an ethical framework in which individuals or corporations are accountable for fulfilling their civic duty and taking actions that will benefit society as a whole. If a company or person is considering taking actions that could harm the environment or society, then those actions are considered socially irresponsible. There are a number of advantages when a company chooses to be socially responsible, such as: 1. Gives a company a competitive edge 2. Attracts strong candidates and increases retention 3. Makes your business attractive to investors 4. Improves business culture 5. Increases customer loyalty and advocacy 6. Improves company reputation
12	**ETHICS:** Ethics or moral philosophy is a branch of philosophy that "involves systematizing, defending, and recommending concepts of right and wrong behavior". The field of ethics, along with aesthetics, concerns matters of value; these fields comprise the branch of philosophy called axiology. Ethics seeks to resolve questions of human morality by defining concepts such as good and evil, right and wrong, virtue and vice, justice and crime. As a field of intellectual inquiry, moral philosophy is related to the fields of moral psychology, descriptive ethics, and value theory.Three major areas of study within ethics recognized today are: Meta-ethics, concerning the theoretical meaning and reference of moral propositions, and how their truth values (if any) can be determined;Normative ethics, concerning the practical means of determining a moral course of action;Applied ethics, concerning what a person is obligated (or permitted) to do in a specific situation or a particular domain of action.

13	**ENVIRONMENTAL HEALTH:** Environmental Health is the branch of public health concerned with all aspects of the natural and built environment affecting human health. Environmental health focuses on the natural and built environments for the benefit of human health. The major subdisciplines of environmental health are: environmental science; environmental and occupational medicine, toxicology and environmental epidemiology. Other terms referring to or concerning environmental health are environmental public health, and health protection. Environmental health was defined in a 1989 document by the World Health Organization (WHO) as: Those aspects of human health and disease that are determined by factors in the environment. It is also referred to the theory and practice of accessing and controlling factors in the environment that can potentially affect health.
14	**OCCUPATIONAL HEALTH:** Occupational health is a multidisciplinary field of healthcare concerned with enabling an individual to undertake their occupation, in the way that causes least harm to their health. It aligns with the promotion of health and safety at work, which is concerned with preventing harm from hazards in the workplace . Occupational health is an area of work in public health to promote and maintain highest degree of physical, mental and social well-being of workers in all occupations.Its objectives are:the maintenance and promotion of workers' health and working capacity;the improvement of working conditions and the working environment to become conducive to safety and health;the development of work organization and working cultures that should reflect essential value systems adopted by the undertaking concerned, and include effective managerial systems, personnel policy, principles for participation, and voluntary quality-related management practices to improve occupational safety and health. develop national policies and action plans and to build institutional capacities on occupational health,scale up the coverage
15	**ENVIRONMENTAL HEALTH SCIENCES HEALTH:** The air we breathe; the water we drink; the land we build on and the homes we live in… numerous elements of our natural and man-made environment have the potential to affect our health. Our complex interactions with the environment and physical surroundings influence our genetics and health. The relationships we have with the environment can give rise to a variety of diseases and health conditions – including asthma, cancer, and food

	poisoning. Environmental health sciences professionals focus on identifying the relationships and risks of the physical environment around us on our health. They actively try to improve the public's health addressing these environmental risk factors and putting in a concerted effort to mitigate the risks around us. This is a wide-ranging, complex, and multifaceted profession, spanning chemistry, toxicology and engineering, among many other disciplines. While a wet-science background is appreciated it is by no means necessary to work in this field. For example, occupation health is a facet of environmental health yet does not always include chemical or toxic assessment, for example, construction workers or factory workers who work with heavy operational machinery every day. Like all public health fields, it also involves collaboration with and reliance upon other professionals, including chemists, geologists, biologists, meteorologists, physicists, physicians, engineers, human resources representatives, and even politicians. When working in an environmental health science field you will be immersed in a "big picture" perspective of how environment and actions heavily affect our daily health. This is a good field for anyone who is interested. In the wake of recent man-made and natural disasters, the US is placing a high priority on building up the nation's public health workforce. Since 2002, Federal funding has increased for public health preparedness, including scholarship and loan repayment programs, workforce development grants, and funding for emergency preparedness. What does this mean for you? It means that with a degree in public health, you'll be in high demand—and on a career path filled with advancement opportunities.

16	**BEHAVIOR AND SOCIETY HEALTH:** Department of Health, Behavior and Society About. In the Department of Health, Behavior and Society (HBS), we develop, evaluate, and implement solutions to... Programs. Summer Institute. Our HBS Summer Institute offers short, intensive courses that provide students with an understanding Winter Institute. Our HBS Winter Institute offers compressed, intensive courses exploring behavioral and societal In the Department of Health, Behavior and Society (HBS), we develop, evaluate, and implement solutions to pressing public health challenges in Baltimore, throughout the U.S., and in some two dozen countries around the world. We believe that human behaviors are key determinants of health and well-being and that behavioral determinants reside at multiple levels, including: The individual level: people's own attitudes, beliefs, and emotions. The interpersonal level: people's social networks at home, the workplace, and elsewhere. The policy level: policies that promote or hinder access to healthy living, including access to healthcare, insurance, and housing. The structural level: structures of racism, inequity, and injustice.
17	**POLICY AND MANAGEMENT:** The Foundational Role of Policies in the Organization. Policies are critical to the organization as they establish boundaries of behavior for individuals, processes, relationships, and transactions. Policy management is the process of creating, communicating, and maintaining policies and procedures within an organization. An effective policy management system can mitigate risk in two ways. First, it makes policies more quickly accessible to direct care staff, guiding care and safety decisions. Second, it can protect an organization from litigation by staying up to date on accreditation standards and creating an audit trail in the case of legal action. Because the process of managing policies can be expensive and time consuming, hospital boards should make the implementation of an efficient policy management system a priority. A comprehensive and well-managed set of policies can support GRC activities by communicating boundaries and expectations, establishing a culture of compliance within the organization, protecting the organization from litigation, and helping achieve the organization's objectives.

	Policy management can be described in the following four step cycle: 1. Creation: When a need is identified within an organization, a policy is written and goes through an approval process. 2. Communication: After creation and approval, a policy is communicated to staff. This includes publication of the policy, training, and attestation. 3. Management: Throughout the life of the policy, it is consistently enforced and exceptions are managed when applicable. 4. Maintenance: Policies are reviewed regularly, updated, and archived when necessary (Open Compliance & Ethics Group, 2012).
18	**WELLNESS:** Wellness is an active process of becoming aware of and making choices towards a healthy and fulfilling life. It is more than being free from illness, it is a dynamic process of change and growth. A good or satisfactory condition of existence; a state characterized by health, happiness, and prosperity; welfare. "Wellness is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity." – The World Health Organization. According to several studies, the most common health problem in the world is depression. This problem is often manifested in the form of insomnia, stress, poor nutrition, physical inactivity, obesity, and heart disease, etc. Irrespective of a person's age, size, shape or perceived attractiveness, it is wellness that is the cornerstone of quality of life. It determines how we ultimately look, feel, interact with others and thrive in life and work. Wellness is the conscious development of the whole self. Embarking on a wellness journey is a process of searching for the appropriate "tools" to make you a healthier and happier human being, plus discovering your own effective methods to use these "tools" for continued growth and development. As there is a great variety on all aspects of life, there are also countless ways to cultivate yourself on an ever-changing path of wellness.
19	**OVERALL ASPECTS OF PSYCHIATRY AS A MEDICAL DISCIPLINE & ITS SOCIAL APPLICABILITY IN INDIA:** Human rights and mental health care of vulnerable population need supportive legislations and policies. Both "hard" and "soft" laws relevant to mental health care have been devised internationally and locally. Amendments in laws and the formulation of new laws are often required and have been seen to occur in the area of mental health care in

	India. So far, reform in mental health care has largely been reactive, but newer legislations and policies carry the hope of proactive reform. The lack of trained human resources is one of the biggest problems in effective mental health care delivery in India. People with mental disorders are vulnerable to abuse and violation of their basic rights. Such abuse or violation may occur from diverse elements in society including institutions, family members, caregivers, professionals, friends, unrelated members of the community, and law enforcing agencies. This sets an imperative for a protective mechanism to ensure appropriate, adequate, timely, and humane health care services. Such protective mechanisms include legislative provisions and policies to ensure that the rights of this vulnerable group are protected. In the undeniable context that every society needs laws in various areas to maintain the well-being of its people, mental health care is one such important area that requires appropriate legislation. In this paper, we first provide a brief overview of the "hard" and "soft" laws that have been influential in mental health policy and care, both internationally and nationally. We then provide a brief glimpse of some of the efforts at the national level to address issues of human rights of persons with mental illness. This is followed by a summary of the broad areas that forensic psychiatry embraces. We then examine the status of forensic psychiatry in India and finally discuss the need to develop comprehensive forensic services and training in India.
20	**PSYCHIATRIC CARE & TREATMENT:** Psychiatric care leads to improved management of medically ill patients with psychiatric comorbidity. This is the rationale of the practice of c-l psychiatry, whose benefits can be demonstrated within a value matrix, taking into account treatment outcomes in medically ill patients with psychiatric comorbidity, as well as economic savings by adding specialist psychiatric treatment to standard medical treatment. Cost–benefit issues of consultation psychiatry service delivery have been demonstrated initially in general hospital inpatients, with primarily US studies showing a trend to reduced length of hospital stay with corresponding reductions in cost of treatment in medical patients after a psychiatric liaison service was inaugurated, compared with control groups without such an intervention program (APM 1997). Housing and psychiatric treatment are key interventions for the mentally ill homeless, but neither of these alone is sufficient to significantly improve their situation. A variety of interventions have evolved that combine these components in different ways. All models that integrate housing and mental health care have been shown to be

	more effective in reducing homelessness than has standard mental health care. Supported housing is consistently shown to have the greatest effect on housing stability, with lesser effects on psychiatric symptoms, hospitalisations.
21	**MEDICAL MANAGEMENT OF PATIENTS WITH PSYCHIATRIC ISSUES:** Psychomotor agitation (PMA) is a state of motor restlessness and mental tension that requires prompt recognition, appropriate assessment and management to minimize anxiety for the patient and reduce the risk for escalation to aggression and violence. Standardized and applicable protocols and algorithms can assist healthcare providers to identify patients at risk of PMA, achieve timely diagnosis and implement minimally invasive management strategies to ensure patient and staff safety and resolution of the episode. Methods Spanish experts in PMA from different disciplines (psychiatrists, psychologists and nurses) convened in Barcelona for a meeting in April 2016. Based on recently issued international consensus guidelines on the standard of care for psychiatric patients with PMA, the meeting provided the opportunity to address the complexities in the assessment and management of PMA from different perspectives. The attendees worked towards producing a consensus for a unified approach to PMA according to the local standards of care and current local legislations. The draft protocol developed was reviewed and ratified by all members of the panel prior to its presentation to the Catalan Society of Psychiatry and Mental Health, the Spanish Society of Biological Psychiatry (SEPB) and the Spanish Network Centre for Research in Mental Health (CIBERSAM) for input. The final protocol and algorithms were then submitted to these organizations for endorsement. Results The protocol presented here provides guidance on the appropriate selection and use of pharmacological agents (inhaled/oral/IM), seclusion, and physical restraint for psychiatric patients suspected of or presenting with PMA. The protocol is applicable within the Spanish healthcare system. Implementation of the protocol and the constituent algorithms described here should ensure the best standard of care of patients at risk of PMA. Episodes of PMA could be identified earlier in their clinical course and patients could be managed in the least invasive and coercive manner, ensuring their own safety and that of others around them.

22	**MATERIAL DEVELOPMENT FOR DENTAL APPLICATION NANOTOXICOLOGY:** Oral medicine is one of the most prevalent areas for the growth of nanotechnology to improve people's dental health, and therefore having the potential to improve the quality of life. Safety issues regarding the use of nanomaterials on human have been debated over years, however, research on nanomaterials has established that its use has more advantages compared to disadvantages The study of nanoscience involves a scale within a range of 1–100 nm Research in nano-biotechnology has also led to the development of environmentally friendly nanofillers using “green chemistry” . Nanomaterials have unique physical and chemical properties owing to their small size and large numbers, therefore an overall large surface area which have attracted much attention for its use in various dental applications A challenge most dentists face is to find composites that mimic the lost dentinal tissue and are capable of restoring the original dental aesthetic. The development of nanotechnology based bio-mimetic approach to replicate natural bio-material has been viewed as a newer way to create advanced nano-materials Oral antibacterial materials work by breaking down or preventing the formation of biofilms on teeth surfaces in the mouth. Adding elements such as silver, gold, or titanium nanoparticles in the mixer of biomaterials can potentially improve antimicrobial properties Metallic nanoparticles (Metallic NPs) provide a large surface area which increases their anti-bacterial reach. In addition, metallic nanoparticles enhance mechanical properties such as strength and durability Inorganic Nanoparticles primarily based on metal NPs, metal oxides NPs have shown their possible use as fillers for dental nanocomposites A pathogenic micro-organism such as Streptococcus mutans (S. mutans) forms colonies between the marginal gaps between the enamel and dental restorations that leads to destruction of tooth.
23	**BIOMEDICAL ENGINEERING:** Biomedical engineering (BME) or medical engineering is the application of engineering principles and design concepts to medicine and biology for healthcare purposes (e.g., diagnostic or therapeutic). BME is also traditionally known as "bioengineering", but this term has come to also refer to biological engineering. This field seeks to close the gap between engineering and medicine, combining the design and problem-solving skills of engineering with medical biological sciences to advance health care treatment, including diagnosis, monitoring, and therapy. Also included under the scope of a biomedical engineer is the management of current medical equipment in hospitals while adhering to relevant industry standards. This involves making equipment recommendations, procurement,

	routine testing, and preventive maintenance, a role also known as a Biomedical Equipment Technician (BMET) or as clinical engineering. Biomedical engineering has recently emerged as its own study, as compared to many other engineering fields. Such an evolution is common as a new field transition from being an interdisciplinary specialization among already-established fields to being considered a field in itself. Much of the work in biomedical engineering consists of research and development, spanning a broad array of subfields (see below). Prominent biomedical engineering applications include the development of biocompatible prostheses, various diagnostic and therapeutic medical devices ranging from clinical equipment to micro-implants, common imaging equipment such as MRIs and EKG/ECGs, regenerative tissue growth, pharmaceutical drugs and therapeutic biologicals.
24	**EPIDEMOLOGY :** The basic knowledge of Epidemiology, of how, when and why diseases occur in different groups of people has assumed great importance esp. in post-Covid 19 era. The role of epidemiology within the broader field of public health and its relationship to medicine, social and behavioural sciences, environmental science, and health policy needs to be highlighted to understand the disease and design suitable preventive and control measures. Epidemiological research is enriched by important disease outcomes, such as Vector-borne diseases, AIDS, tuberculosis, and cancer, and factors important in disease causation, such as nutrition, socioeconomic, the environment etc. The SIP for Epidemiology programme will gives an opportunity to analyse the distribution and determinants of both chronic and infectious diseases in different populations, apply principles of disease prevention within populations, and discuss contemporary issues in epidemiological research in at least three substantive areas (e.g., diseases, other health outcomes, exposures). It will provide the skills needed to conduct research into the causes, prevention, and control of Communicable and Non-communicable diseases. Epidemiology is the study of the distribution and determinants of health-related states or events in specified populations,

25	**NUTRITION & DIETETICS:** Nutrition & Dietetics, a subdiscipline of Medicine, is the science that focuses on everything related to food and its effect on our health and overall wellbeing. Nutritionists and dietitians aim to improve people's health and help them make better dietary choices. They also help patients find a balance between good eating habits and exercising.Nutrition & Dietetics applies to a variety of sciences, but the two most popular specialisations are weight control and chronic illnesses. If you want to change your diet, it's best to consult a certified nutritionist. There are many diets on the internet, but you should always talk with a professional before adopting one. Students in Nutrition & Dietetics discover why and how certain eating and nutritional habits are affecting us, and ways we can improve our health. You also learn to provide proper consultation to patients and design nutritional therapies based on people's individual metabolisms. This knowledge will not only help you to treat people's diseases, but also to prevent them. The need for nutritionists is increasing due to the fast pace of our world and our lifestyle. Nutritionists are the people who make sure we don't eat just the food that only tastes good and looks good, but also the food that's healthy for us.Your job won't be simple, as it's often easier for people to start a bad habit than change it. Still, you can make an important difference in people's lives and help them live longer and healthier. You'll also need to have knowledge about how exercising helps complement a healthy diet in order to give the right advice to your patients. Graduates from a Bachelor's or Master's degree in Nutrition & Dietetics will easily find jobs in fields and organisations such as: private sector or public hospitals, nursing care facilities, advertising or marketing, food manufacturing.
26	**BIOSTATISTICS :** Biostatistics is the application of statistical techniques to scientific research in health-related fields, including medicine, biology, and public health, and the development of new tools to study these areas. Since the beginning of the twentieth century, the field of biostatistics has become an indispensable tool in improving health and reducing illness.What do Biostatisticians do?Biostatisticians play essential roles in designing studies, analyzing data and creating methods to attack research problems as diverse as:-the determination of major risk factors for heart disease, lung disease and cancer-the testing of new drugs to combat AIDS-the evaluation of potential environmental factors harmful to human health, such as tobacco smoke, asbestos or pollutants.What are the career prospects for Biostatistics PSM graduates?Job prospects for biostatistics graduates are excellent, with career opportunities in

	university research facilities and pharmaceutical and medical device companies.What is Categorical Data Analysis?What is Survival Analysis?Survival analysis concerns the statistical modelling of time-to-outcome data, i.e. data where the variable of primary interest is the time interval between some specified origin and the event of interest occurring. The event of interest is usually referred to as the outcome or endpoint (other terms include terminating or target event, or failure). Survival data may also be referred to as time-to-event data, lifetime data, failure time data, reliability data, duration data or event history data. It arises commonly in applications in Medicine, Social Sciences and Engineering.What is Clinical Trials?A clinical trial is a research study to answer specific questions about vaccines or new therapies or new ways of using known treatments. Clinical trials (also called medical research and research studies) are used to determine whether new drugs or treatments are both safe and effective. Carefully conducted clinical trials are the fastest and safest way to find treatments that work.
27	**HOLISTIC APPROACH TOWARD PREVENTION OF AGING & HEALTHY LIVING :** Objectives: To date, methodologies are lacking that address a holistic assessment of wellness in older adults. Technology applications may provide a platform for such an assessment, but have not been validated. We set out to demonstrate whether e-health applications could support the assessment of older adults' wellness in community-dwelling older adults. Materials and Methods: Twenty-seven residents of independent retirement community were followed over 8 weeks. Subjects engaged in the use of diverse technologies to assess cognitive performance, physiological and functional variables, as well as psychometric components of wellness. Data were integrated from various e-health sources into one study database. Correlations were assessed between different parameters, and hierarchical cluster analysis was used to explore the validity of the wellness model. Results: We found strong associations across multiple parameters of wellness within the conceptual model, including cognitive, functional, and physical. However, spirituality did not correlate with any other parameter studied in contrast to prior studies of older adults. Participants expressed overall positive attitudes toward the e-health tools and the holistic approach to the assessment of wellness, without expressing any privacy concerns. Conclusions: Parameters were highly correlated across multiple domains of wellness. Important clusters were noted to be formed across cognitive and physiological domains, giving further evidence of need for an integrated approach to the assessment of wellness.

28	**MEDICAL TECHNOLOGY TRADITIONAL HEALTH CARE SYSTEM:** Traditional medicine refers to health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well-being. In the last decade traditional medicine has become very popular in Cameroon, partly due to the long unsustainable economic situation in the country. The high cost of drugs and increase in drug resistance to common diseases like malaria, bacteria infections and other sexually transmitted diseases has caused the therapeutic approach to alternative traditional medicine as an option for concerted search for new chemical entities (NCE). The World Health Organisation (WHO) in collaboration with the Cameroon Government has put in place a strategic platform for the practice and development of TM in Cameroon. This platform aims at harmonizing the traditional medicine practice in the country, create a synergy between TM and modern medicine and to institutionalize a more harmonized integrated TM practices by the year 2012 in Cameroon. An overview of the practice of TM past, present and future perspectives that underpins the role in sustainable poverty alleviation has been discussed. This study gives an insight into the strategic plan and road map set up by the Government of Cameroon for the organisational framework and research platform for the practice and development of TM, and the global partnership involving the management of TM in the country.
29	**YOGA NATUROPATHY & AYURVEDA INTERVENTION:** Nature cure or Naturopathy medicine is a form of alternative medicine that works in helping the body to heal itself, using the force of Nature It fundamental belief is using the 5 primordial agents of nature that is the earth water fire and the air along with ether. Naturopathy does not believe in the specific cause of disease and its specific treatment but takes into account the totality of factors responsible for disease such as ones unnatural habits in living, thinking, working, sleeping, relaxing, sexual indulgence etc. It also considers the environmental factors involved which on the whole disturb the normal functioning of the body and lead to a morbid, weak and toxic state.The treatment is based on the concept that nature has a solution for our problems including health. The human body has the ability to perform the most complicated functions and to cope with various adverse situations.Yoga therapy, a modern phenomenon which has been influenced by the ancient Indian practice of yoga.It involves holding stretches as a kind of low-impact physical exercise, and is often used for therapeutic purposes.It is used to treat existing mental and physical health issues, but can also be used as a self-care strategy for prevention and maintenance.Both the meditative and the exercise

	components of yoga have been researched for specific and non-specific health benefits.It has been studied as an intervention for many conditions, including back pain, stress, and depression.
30	**GENETIC COUNSELING:** Genetic counseling is the professional interaction between a healthcare provider with specialized knowledge of genetics and an individual or family. The genetic counselor determines whether a condition in the family may be genetic and estimates the chances that another relative may be affected. Genetic counselors also offer and interpret genetic tests that may help to estimate risk of disease. The genetic counselor conveys information in an effort to address concerns of the client and provides psychological counseling to help families adapt to their condition or risk. Genetic counseling is a professional interaction between a provider and somebody from the general public. You can request to see a genetic counselor because you have a concern about something that's in your family history or you want to know what screening tests are available to you in order to prevent something from occurring in your family. Or you might undergo genetic counseling because somebody is concerned that something's wrong with your child or somebody else in your family. We think about genetic counseling as a process. It's a process of understanding the genetic contribution to disease. It's a process of understanding ways to avoid risks or minimize risks to affected individuals. But importantly, it's also a process in which people can talk about their feelings of loss, and disappointment and heartbreak and be given opportunities to make good, informed decisions and to improve their health outcomes.

31	**ELECTRONIC MEDICAL RECORDS & HIMS:** The HIMSS Electronic Medical Record Adoption Model (EMRAM) measures clinical outcomes, patient engagement and clinician use of EMR technology to strengthen organizational performance and health outcomes across patient populations. The internationally applicable EMRAM incorporates methodology and algorithms to score a whole hospital, including inpatient, outpatient and day case services provided on the hospital campus. EMRAM scores hospitals around the world relative to their digital maturity, providing a detailed road map to ease adoption and begin a digital transformation journey towards aspirational outcomes. Measuring evidence-based data at each stage, organizations use EMRAM to optimize digital work environments, improve performance and financial sustainability, build a sustainable workforce, and support an exceptional patient experience. Leveraging information digitally improves patient safety and clinician satisfaction by reducing errors in care, length of stay for patients and duplicated care orders, and streamlining the access and use of data to inform care delivery.
32	**NABH (QUALITY MANAGEMENT SYSTEMS) :** NABH Standards for hospitals, 4th Edition, December 2015 has been released (set of three books, NABH Standards, Guide Book and Annexure) can be procured for Rs. 3500/-. The standards provide framework for quality assurance and quality improvement for hospitals. The standards focus on patient safety and quality of care. The standards call for continuous monitoring of sentinel events and comprehensive corrective action plan leading to building of quality culture at all levels and across all the functions. The 10 chapters in the standard reflect two major aspects of healthcare delivery i.e. patient centered functions (chapter 1-5) and healthcare organisation centered functions
33	**MANAGEMENT:** Management (or managing) is the administration of an organization, whether it is a business, a non-profit organization, or a government body. It is the art and science of managing resources of the business. Management includes the activities of setting the strategy of an organization and coordinating the efforts of its employees (or of volunteers) to accomplish its objectives through the application of available resources, such as

	financial, natural, technological, and human resources. "Run the business" and "Change the business" are two concepts that are used in management to differentiate between the continued delivery of goods or services and adapting of goods or services to meet the changing needs of customers - see trend. The term "management" may also refer to those people who manage an organization—managers. Some people study management at colleges or universities; major degrees in management includes the Bachelor of Commerce (B.Com.), Bachelor of Business Administration (BBA.), Master of Business Administration (MBA.), Master in Management (MSM or MIM) and, for the public sector, the Master of Public Administration (MPA) degree. Individuals who aim to become management specialists or experts, management researchers, or professors may complete the Doctor of Management (DM), the Doctor of Business Administration (DBA), or the Ph.D. in Business Administration or Management. In the past few decades, there has been a movement for evidence-based management.
34	**HEALTH ISSUES OF URBAN SLUMS:** Urban slums, like refugee communities, comprise a social cluster that engenders a distinct set of health problems. With 1 billion people currently estimated to live in such communities, this neglected population has become a major reservoir for a wide spectrum of health conditions that the formal health sector must deal with. Unlike what occurs with refugee populations, the formal health sector becomes aware of the health problems of slum populations relatively late in the course of their illnesses. As such, the formal health sector inevitably deals with the severe and end-stage complications of these diseases at a substantially greater cost than what it costs to manage non-slum community populations. Because of the informal nature of slum settlements, and cultural, social, and behavioral factors unique to the slum populations, little is known about the spectrum, burden, and determinants of illnesses in these communities that give rise to these complications, especially of those diseases that are chronic but preventable. In this article, we discuss observations made in one slum community of 58,000 people in Salvador, the third largest city in Brazil, to highlight the existence of a spectrum and burden of chronic illnesses not likely to be detected by the formal sector health services until they result in complications or death. Lack of health-related data from slums could lead to inappropriate and unrealistic allocation of health care resources by the public and private providers. Similar misassumptions and misallocations are likely to exist in other nations with large urban slum populations.

35	**HEALTH ISSUES OF RURAL POPULATION:** The rural population is consistently less well-off than the urban population with respect to health. Differences between the two populations are not always substantial, however. The rural population is more likely to engage in risky health-related behaviors and to experience higher rates of chronic conditions and activity limitations. Rural residents are also more likely to be uninsured for longer periods of time, and are less likely than urban residents to receive some types of health care, including tests for various chronic conditions. Limited access to health care in rural areas is generally associated with the fact that there are fewer providers. This Profile compares people who live in a metro-politan statistical area (MSA) to those who do not (non-MSA). People who reside in a MSA are referred to as urban residents and those who live in a non-MSA are referred to as rural residents. About one-fifth of the U.S. population resides in a rural area. Larger differences between the rural and urban populations may be masked as a result of the way the data are reported. The use of broad “urban” and “rural” categories may mask some differences because of the substantial variations in population size and density. For example, a rural area may refer to a county with a city of 10,000 or more, or to a frontier area which has an extremely low population density, usually fewer than 6 people per square mile.
36	**BLOOD DONATION MOVEMENT:** The history of voluntary blood donation in India dates back to 1942 during the second world war when blood donors were required to help the wounded soldiers. The first blood bank was established in Kolkata, West Bengal in March 1942 at the All India Institute of Hygiene and Public Health and was managed by the Red Cross. The donors were mostly government employees and people from the Anglo-Indian community who donated blood for a humanitarian cause. The number of voluntary donors declined after the war and donors had to be paid for the blood. Leela Moolgaonkar, a social reformer, initiated voluntary blood donation camps in Mumbai from 1954.[1] The 1960s saw many blood banks open in different cities. In 1975, the Indian Society of Blood Transfusion and Immunohaematology headed by J. G. Jolly declared 1 October as the National Voluntary Blood Donation Day Criteria to donate blood there are several parameters that determine the eligibility of an individual to donate blood. Guidelines laid down by the Ministry of Health, Government of India have to be followed by blood banks for donor screening.

37	**BLOOD BANKING:** Blood banking is the process that takes place in the lab to make sure that donated blood, or blood products, are safe before they are used in blood transfusions and other medical procedures. Blood banking includes typing the blood for transfusion and testing for infectious diseases. A certain set of standard tests are done in the lab once blood is donated, including, but not limited to, the following:Typing: ABO group (blood type) Rh typing (positive or negative antige) Screening for any unexpected red blood cell antibodies that may cause problems in the recipient Screening for current or past infections, including: Hepatitis viruses B and C Human immunodeficiency virus (HIV) Human T-lymphotropic viruses (HTLV) I and II Syphilis What are the components of blood? While blood, or one of its components, may be transferred, each component serves many functions, including the following: Red blood cells. These cells carry oxygen to the tissues in the body and are commonly used in the treatment of anemia. Platelets. They help the blood to clot and are used in the treatment of leukemia and other forms of cancer. White blood cells. These cells help to fight infection, and aid in the immune process.Plasma. The watery, liquid part of the blood in which the red blood cells, white blood cells, and platelets are suspended. Plasma is needed to carry the many parts of the blood through the bloodstream. Plasma serves many functions, including the following: Helps to maintain blood pressure
38	**NANO TECHNOLOGY:** Nanotechnology is science, engineering, and technology conducted at the nanoscale, which is about 1 to 100 nanometers. Nanoscience and nanotechnology are the study and application of extremely small things and can be used across all the other science fields, such as chemistry, biology, physics, materials science, and engineering. The ideas and concepts behind nanoscience and nanotechnology started with a talk entitled “There’s Plenty of Room at the Bottom” by physicist Richard Feynman at an American Physical Society meeting at the California Institute of Technology (CalTech) on December 29, 1959, long before the term nanotechnology was used. In his talk, Feynman described a process in which scientists would be able to manipulate and control individual atoms and molecules. Over a decade later, in his explorations of ultraprecision machining, Professor Norio Taniguchi coined the term nanotechnology. It wasn't until 1981, with the development of the scanning tunneling microscope that could "see" individual atoms, that modern nanotechnology began It’s hard to imagine just how small nanotechnology is. One nanometer is a billionth of a meter, or 10-9 of a meter. Here are a few illustrative examples:There are 25,400,000

39	**MOLECULAR BIOLOGY:** Molecular biology is the branch of biology that seeks to understand the molecular basis of biological activity in and between cells, including molecular synthesis, modification, mechanisms, and interactions. The study of chemical and physical structure of biological macromolecules is known as molecular biology. Molecular biology was first described as an approach focused on the underpinnings of biological phenomena - uncovering the structures of biological molecules as well as their interactions, and how these interactions explain observations of classical biology. In 1945 the term molecular biology was used by physicist William Astbury. The development in the field of molecular biology happened very late as to understand that the complex system or advantageous approach would be made in simple way of understanding by using bacteria and bacteriophages this organism yields information about basic biological process more readily than animal cell. In 1953 then two young men named Francis Crick and James Watson working at Medical Research Council unit, Cavendish laboratory, Cambridge (now the MRC Laboratory of Molecular Biology), made a double helix model of DNA which changed the whole research scenario they proposed the DNA structure based on previous research done by Rosalind Franklin and Maurice Wilkins then the research lead to finding DNA material in other microorganisms, plants and animals. Molecular biology is not simply the study of biological molecules and their interactions; rather, it is also collection of techniques developed since the field's genesis which have enabled scientists to learn about molecular processes. One notable technique which has revolutionized the field is the polymerase chain reaction (PCR), which was developed in 1983. PCR is a reaction which amplifies small quantities of DNA, and it is used in many applications across scientific disciplines, as will be discussed later.

40	**BIOMEDICAL INSTRUMENTATION:** ioinstrumentation or Biomedical Instrumentation is an application of biomedical engineering, which focuses on the devices and mechanics used to measure, evaluate, and treat biological systems. It focuses on the use of multiple sensors to monitor physiological characteristics of a human or animal. Such instrumentation originated as a necessity to constantly monitor vital signs of Astronauts during NASA's Mercury, Gemini, and Apollo missions. [dubious – discuss] Bioinstrumentation is a new and upcoming field, concentrating on treating diseases and bridging together the engineering and medical worlds. The majority of innovations within the field have occurred in the past 15-20 years. Bioinstrumentation has revolutionized the medical field, and has made treating patients much easier. The instruments/sensors convert signals found within the body into electrical signals. There are many subfields within bioinstrumentation, they include: biomedical options, creation of sensor, genetic testing, and drug delivery. Other fields of engineering, such as electrical engineering and computer science, are related to bioinstrumentation. Bioinstrumentation has since been incorporated into the everyday lives of many individuals, with sensor-augmented smartphones capable of measuring heart rate and oxygen saturation, and the widespread availability of fitness apps, with over 40,000 health tracking apps on iTunes alone. Wrist-worn fitness tracking devices have also gained popularity, with a suite of on-board sensors capable of measuring the user's biometrics, and relaying them to an app that logs and tracks information for improvements.
41	**INFECTION BIOLOGY (INFECTIOUS DISEASES) :** Despite India’s rapid economic growth and growing technological prowess, it continues to face a heavy burden of infectious diseases, including high rates of HIV/AIDS, tuberculosis, malaria, and other neglected diseases. Towards this direction with the vision to mitigate the problems associated with these diseases, the Department under Infectious Disease Biology Program solicits a wide array of projects on bacterial, viral, parasitic, and fungal diseases spanning the spectrum from basic biology of human pathogens and their interaction with human hosts, through translational and clinical research toward the development of new and improved diagnostics, drugs, and vaccines for infectious diseases.The following priorities have been envisaged for this program:Understanding the molecular structure and function of known viral, bacterial, fungal and parasitic pathogens and identify new pathogens.Extending insights into mechanisms of infection, pathogenicity, virulence, host-pathogen interactions, development of drug resistance for diseases such as TB, repurposing of drugs for infectious diseases and anti-

	microbial resistance.Development of indigenous, reliable, rapid, sensitive, specific, cost-effective, and easy to use in a variety of settings diagnostic platforms and technologies.Conducting research to better understand and enhance immune responses, and to identify promising new vaccine targets for infectious diseases of national as well as global health importance.Identifying potential targets for developing novel approaches to broad-spectrum interventions and new strategies for developing immunotherapies, including those based on host responses.
42	**ENVIRONMENTAL HEALTH SCIENCES (TOXICOLOGY DEPARTMENT) :** Toxicology and Environmental Health Sciences publishes original Research Articles, Rapid Communications, and Mini Reviews. The Journal is intended to provide a venue for presenting and discussing fundamental and applied research advances relevant to the issues of local/global environments, human/animal health, and occupational safety. In particular, manuscripts with interdisciplinary approaches to solve current local/global environmental issues related with above topics are welcomed; such as cutting-edge applications in basic principles of physics, chemistry and biology, which could contribute significantly with new (or which could advance the understanding) understandings in the predictions, measurements, and assessments of the consequential effects of toxic hazardous harmful chemicals in the environment. The Journal also provides a forum for professionals in academia, industry, and government involved in the use, protection, and management of the chemicals in environment for the enhancement of human health and occupational safety.
43	**PANCHAKARMA THERAPY:** Ayurveda has rightly emphasized that health is not only the state of not having disease but, it is the state of normalcy of Dosha, Dathu, Agni and Malakriya. It also includes the Prasanna Atma (soul), Indriya (sense organs) and Manas (mind). Three doshas of the body, Vata, Pitta and Kapha, which broadly represent the nervous system, the metabolic system and the nutritive system, keep the human body in balance. Whenever the delicate balance between these doshas is disturbed, a disease may be manifested. The main objective of the Ayurvedic system of treatment is to restore the original state of equilibrium between the doshas. In order to achieve the same Ayurveda has advocated certain

	regimens and treatment modalities such as Dinacharya, Rutucharya, Vega Adharana, Rasayana–Vajikarana and Panchakarma. Panchakarma is a method of cleansing the body of all the unwanted waste after lubricating it. Panchakarma are 5 (five) in number; hence the term PANCHA (five) – KARMA (procedures). Panchakarma treatment is unique in the sense that it includes preventive, curative and promotive actions for various diseases. Five Karmas The body can be divided on the basis of the parts that need cleansing. Head, GIT (gastro- intestinal system), upper and lower. The five main Karmas to cleanse the complete body are Vamanam (therapeutic emesis) - induced vomiting helps clear the upper gastro till the duodenum (end of stomach) and part of the respiratory tract. Virechanam (purgation) - induced purgation clears the lower gastro from the duodenum (end of stomach) till the exit. Anuvasana (enema using medicated oil) - Oil enema helps lubricate the rectal area and take out all the lipid soluble waste out through the anus. Nasyam - nasal instillation of medicated substances helps clear the respiratory tract and para-nasal sinuses. Astapana Vasti (Therapeutic Decoction Enema) - decoction enema cleanses the area from the transverse colon till the anus. Steps followed The complete process of Panchakarma consists of three steps. Poorva Karma, which is the preparatory procedure required before the main procedure to enable a person to receive the full benefits of the main treatment. It consists of two main processes – Snehan (oleation) and Swedan (fomentation). These methods help to dislodge the accumulated poisonous substances in the body, thus preparing them for their complete removal. Pradhan Karma or the main procedure. On completion of the first step, it is decided which of these are to be done depending upon the proximity of the waste. An increased level of upper respiratory tract waste shall call for Vamana. Similarly, a lower gastro accumulation of waste calls for a Virechanam. Paschaat Karma or the post-therapy dietary regimen to restore the body's digestive and absorptive capacity to its normal state

44	**YOGA/AYURVEDA/PANCHKARMA:** At Kaivalyadhama, Yoga with Ayurveda and Panchakarma offers you an integrated approach to renew and destress yourself with herbal treatments for ailments, recovery, and restoration. We believe that combining this age-old wisdom of Ayurveda with yoga promotes and maintains sustained physical and emotional health in routine life. The Ayurveda and Panchakarma course at Kaivalyadhama, begins after a personal medical consultation by an Ayurvedic doctor, depending on the condition of the patient's body. This is an in-depth intervention that helps our doctors gauge the level and depth of physical and emotional disturbance for planning exclusive treatments. Customised programs are thoughtfully designed for healing, detoxification, and rejuvenation. This involves beginning with internal medicinal lubrication to detach the body from toxins by any one or a combination of procedures. Therapies include Abhyanga, Potali, Swedan, Shirodhara, Padyabahyanga, Nasya Basti, Karnapuran, Netrabasti, Lepa, Facial, Hrudbasti, Katibasti, Manyabasti, Sandhibandha, and so on. The combined specialised schedule incorporates your yoga practice, intake of herbal decoction teas, a select saatvik diet with supplements, massages and different therapies with medicated oil & medicated ghee. While the guests have a duration choice of a week or more for this program, a longer stay ensures enhanced benefits of Panchakarma. What is Panchakarma? Based on ancient Ayurvedic principles, Panchakarma involves five procedures: Vaman / Emetics: Therapeutic vomiting, useful in cases of allergies, asthma, sinusitis, purifies respiratory tract. Virechan / Purgation: Useful in heart, blood vessels and liver troubles. Basti / Enema: Two types of enemas are possible. Introduction of decoction or oil in the rectal passage. Useful in disorders of locomotion, in constipation and neurological problems. Nasya / Nasal Administration: Oil or medicated milk or some herbal powder is introduced in the nostrils to expel toxins from forehead and head. It also rejuvenates the sense organs. Raktamoksana / Bloodletting: Involves therapeutic bloodsucking by leeches.

45	**CLINICAL AYURVED:** Ayurvedic medicine (“Ayurveda” for short) is one of the world's oldest holistic (“whole-body”) healing systems. It was developed more than 3,000 years ago in India. It’s based on the belief that health and wellness depend on a delicate balance between the mind, body, and spirit. Its main goal is to promote good health, not fight disease. But treatments may be geared toward specific health problems. Ayurvedic medicine (“Ayurveda” for short) is one of the world's oldest holistic (“whole-body”) healing systems. It was developed more than 3,000 years ago in India. It’s based on the belief that health and wellness depend on a delicate balance between the mind, body, and spirit. Its main goal is to promote good health, not fight disease. But treatments may be geared toward specific health problems. Ayurvedic Treatment An Ayurvedic practitioner will create a treatment plan specifically designed for you. They’ll take into account your unique physical and emotional makeup, your primary life force, and the balance between all three of these elements. The goal of treatment is to cleanse your body of undigested food, which can stay in your body and lead to illness. The cleansing process—called “panchakarma”— is designed to reduce your symptoms and restore harmony and balance. To achieve this, an Ayurvedic practitioner might rely on blood purification, massage, medical oils, herbs, and enemas or laxatives.

ALTERNATIVE MEDICINE:

Alternative medicine is any practice that aims to achieve the healing effects of medicine, but which lacks biological plausibility and is untested, untestable or proven ineffective. Complementary medicine (CM), complementary and alternative medicine (CAM), integrated medicine or integrative medicine (IM), and holistic medicine are among many rebrandings that describe various ways alternative medicine is combined with mainstream medicine. Alternative therapies share in common that they reside outside of medical science and instead rely on pseudoscience. Traditional practices become "alternative" when used outside their original settings without proper scientific explanation and evidence. Frequently used derogatory terms for the alternative are new-age or pseudo, with little distinction from quackery.

Some alternative practices are based on theories that contradict the science of how the human body works; others resort to the supernatural or superstitious to explain their effect. In others, the practice is plausibly effective but has too many side effects. Alternative medicine is distinct from scientific medicine, which employs the scientific method to test plausible therapies by way of responsible and ethical clinical trials, producing evidence of either effect or of no effect. Research into alternative therapies often fails to follow proper research protocols (such as placebo-controlled trials, blind experiments and calculation of prior probability), providing invalid results.

Much of the perceived effect of an alternative practice arises from a belief that it will be effective (the placebo effect), or from the treated condition resolving on its own (the natural course of disease). This is further exacerbated by the tendency to turn to alternative therapies upon the failure of medicine, at which point the condition will be at its worst and most likely to spontaneously improve. In the absence of this bias, especially for diseases that are not expected to get better by themselves such as cancer or HIV infection, multiple studies have shown significantly worse outcomes if patients turn to alternative therapies. While this may be because these patients avoid effective treatment, some alternative therapies are actively harmful (e.g. cyanide poisoning from amygdalin, or the intentional ingestion of hydrogen peroxide) or actively interfere with effective treatments.

The alternative sector is a highly profitable industry with a strong lobby, and faces far less regulation over the use and marketing of unproven treatments. Its marketing often advertises the treatments as being "natural" or "holistic", in comparison to those offered by medical science. Billions of dollars have been spent studying alternative medicine, with few or no positive results. Some of the successful practices are only considered alternative under very specific definitions, such as those which include all physical activity under the umbrella of "alternative medicine".

47	**HEALTH INFORMATICS:** Health informatics is the field of science and engineering that aims at developing methods and technologies for the acquisition, processing, and study of patient data, which can come from different sources and modalities, such as electronic health records, diagnostic test results, medical scans. The health domain provides an extremely wide variety of problems that can be tackled using computational techniques. Health informatics is a spectrum of multidisciplinary fields that includes study of the design, development and application of computational innovations to improve health care. The disciplines involved combines medicine fields with computing fields, in particular computer engineering, software engineering, information engineering, bioinformatics, bio-inspired computing, theoretical computer science, information systems, data science, information technology, autonomic computing, and behavior informatics. In academic institutions, medical informatics research focus on applications of artificial intelligence in healthcare and designing medical devices based on embedded systems.[2] In some countries term informatics is also used in the context of applying library science to data management in hospitals.
48	**BIOINFORMATICS:** Bioinformatics is a field of computational science that has to do with the analysis of sequences of biological molecules. Usually refers to genes, DNA, RNA, or protein, and is particularly useful in comparing genes and other sequences in proteins and other sequences within an organism or between organisms, looking at evolutionary relationships between organisms, and using the patterns that exist across DNA and protein sequences to figure out what their function is. You can think about bioinformatics as essentially the linguistics part of genetics. That is, the linguistics people are looking at patterns in language, and that's what bioinformatics people do-looking for patterns within sequences of DNA or protein.
49	**MEDICAL RECORD SCIENCE & CLINICAL INFORMATION TECHNOLOGY(MRS&CIT)** Aims & Objective of the course are :- 1. To have exposure to the vast strides in the classification and codification of drugs, diseases and their treatment, and in the organization of hospitals. 2. To acquire sufficient knowledge of the prevailing system of scientific documentation with computerization, information search and retrieval.

	3. To acquire knowledge of the networking of hospitals and institutions by the Internet and Intranet. 4. To get familiarity with large databases dealing with various categories of entities such as diseases, pathological conditions, symptoms, drugs, and concepts such as 'data mining' 5. To acquire knowledge of the current trends in Medical Record Science like health insurance and third-party payers. 6. To integrate advanced knowledge and skills in health care data. 7. Apply effective communication skills and strategies in interactions with multidisciplinary and multi-facility professionals. Medical Records (MRs) is a set of documents that renders the clinical, para-clinical care, and financial information about the patient. The Medical Records Department (MRD) is responsible for collecting, and protecting patient information, and for disseminating it to the right people or an organization, in order to promote the quality of patient care.
50	**CLINICAL RESEARCH METHODOLOGY & BIOSTATISTICS:** Clinical research is important to collect, analyze, present, and interpret data. It finds applications in various fields such as epidemiology, clinical trials, population genetics, systems biology, and more. Research using human volunteers (also called participants) that is intended to add to medical knowledge. There are two main types of clinical studies: clinical trials (also called interventional studies) and observational studies. Biostatistics mainly addresses the development, implementation, and application of statistical methods in the field of medical research. Therefore, an understanding of the medical background and the clinical context of the research problem they are working on is essential for biostatisticians.

51	**CLINICA RESEARCH (AYURVED) :** Clinical trials on Ayurveda refers to any clinical trials done on Ayurvedic treatment. Ayurveda is a traditional medicine system in India and like other cultural medical practices includes both conventional medicine and also complementary and alternative medicine. When there are clinical trials in Ayurveda, the focus tends to be on practices in alternative medicine. A 2017 essay described that in India, Ayurveda is inadequately equipped to manage many modern diseases, owing to insufficient research and development. The essay argued that clinical trials in Ayurveda should focus on areas outside the scope of modern medicine. Also, while there is a short history of clinical research on Ayurvedic treatments, there is no existing systematic review available which identifies all the studies and interprets them as a whole. Educational organizations which teach Ayurveda require training if they are to design clinical trials on Ayurvedic treatments. As of 2016 the Clinical Trials Registry - India contained approximately 200 records of clinical trials on Ayurvedic treatments.
52	**MEDICAL ONCOLOGY (AYURVED):** Ayurveda is an alternative medicine system with historical roots in the Indian subcontinent. The theory and practice of Ayurveda is pseudoscientific. The Indian Medical Association describes Ayurvedic practitioners who claim to practice medicine as quacks. Ayurveda is heavily practiced in India and Nepal, where around 80% of the population report using it. Ayurveda therapies have varied and evolved over more than two millennia. Therapies include herbal medicines, special diets, meditation, yoga, massage, laxatives, enemas, and medical oils. Ayurvedic preparations are typically based on complex herbal compounds, minerals, and metal substances (perhaps under the influence of early Indian alchemy or rasashastra). Ancient Ayurveda texts also taught surgical techniques, including rhinoplasty, kidney stone extractions, sutures, and the extraction of foreign objects. The main classical Ayurveda texts begin with accounts of the transmission of medical knowledge from the gods to sages, and then to human physicians. In Sushruta Samhita (Sushruta's Compendium), Sushruta wrote that Dhanvantari, Hindu god of Ayurveda, incarnated himself as a king of Varanasi and taught medicine to a group of physicians, including Sushruta. Ayurveda has been adapted for Western consumption, notably by Baba Hari

	Dass in the 1970s and Maharishi Ayurveda in the 1980s. Some scholars assert that Ayurveda originated in prehistoric times. Ayurveda developed significantly during the Vedic period and later some of the non-Vedic systems such as Buddhism and Jainism also developed medical concepts and practices that appear in the classical Ayurveda texts. In Ayurveda texts, Dosha balance is emphasized, and suppressing natural urges is considered unhealthy and claimed to lead to illness.[20] Ayurveda treatises describe three elemental doshas viz. vāta, pitta and kapha, and state that balance (Skt. sāmyatva) of the doshas results in health, while imbalance (viṣamatva) results in disease.
53	**BIOLOGICAL TRANSPORT PHENOMENA:** The transport of heat and molecules underlies numerous important applications in biomedical engineering. A strong understanding of transport phenomena is crucial to fields as diverse as drug delivery, forensics, tissue engineering, non-invasive imaging, and the development of artificial organs. This course focuses on the fundamental concepts and equations that govern heat and mass transfer, mathematical methods for solving transport problems, and ways of relating complex problems to simpler ones that illustrate key principles. Fundamentals and integration of fluid mechanics, heat transfer, and mass transfer in living systems. Basic concepts of transport phenomena are presented and applied to biological systems and to the design of medical devices.

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COMPLEMENTARY & INTEGRATED HEALTH

Integrative health is relationship-centered care that focuses on the whole person, is informed by evidence, and makes use of all appropriate therapeutic approaches, healthcare professionals and disciplines to achieve optimal health and healing, including evidence-based complementary and alternative medicine.

According to the Consortium of Academic Health Centers for Integrative Medicine and Health, integrative medicine is defined as the practice of medicine that reaffirms the importance of the relationship between practitioner and patient, focuses on the whole person, is supported by evidence, utilized all appropriate therapeutic and lifestyle approaches, healthcare professionals and disciplines to achieve optimal health and healing. TCAM includes modalities such as Ayurveda, Yoga, traditional Chinese medicine, other traditional systems of medicine, meditation, herbal medicines, nutritional supplements, movement therapies, and other mind-body practices. The World Health Organization (WHO) now refers to this set as Traditional, Complementary and Integrative Medicine (TCIM).

Examples of common practices include:

- Acupuncture.
- Animal-assisted therapy.
- Aromatherapy.
- Dietary supplements.
- Massage therapy.
- Music therapy.
- Meditation.

There has been a surge in the public interest and the use of TCIM globally. Nearly 50% of the population in developed nations (United States, 42%; Australia, 48%; France, 49%; Canada, 70%), and similar or greater numbers in developing countries (India, 70%; China, 40%; Chile, 71%; Colombia, 40%; up to 80% in Africa) use some form of TCIM. The World Health Organization and governments of several countries have established agencies to support research and practical utilization of TCIM

55	**ONE NATION ONE HEALTH CARE:** Recent reports of healthcare reforms in India have reinforced the view that India's current healthcare system is not sustainable for its 1.25 billion population. An estimated 600 million people in India, many in rural locations, have little or no access to better healthcare facilities. This can be overcome by combining all aspects of medical health, encompassing social, spiritual, mental and medical components of healthcare system (integration at ministry level, public and private health care facilities and medical colleges along with involvement of the public) The key to delivering free healthcare in India without compromising quality is the biggest challenge. Our One Nation One Health strives hard to ensure that every citizen of India gets free and quality health care by 2030.
56	**NATIONAL HEALTH POLICY :** The primary aim of the National Health Policy, 2017, is to inform, clarify, strengthen and prioritize the role of the Government in shaping health systems in all its dimensions- investments in health, organization of healthcare services, prevention of diseases and promotion of good health through cross sectoral actions, access to technologies, developing human resources, encouraging medical pluralism, building knowledge base, developing better financial protection strategies, strengthening regulation and health assurance. Goal The policy envisages as its goal the attainment of the highest possible level of health and wellbeing for all at all ages, through a preventive and promotive health care orientation in all developmental policies, and universal access to good quality health care services without anyone having to face financial hardship as a consequence. This would be achieved through increasing access, improving quality and lowering the cost of healthcare delivery. The policy recognizes the pivotal importance of Sustainable Development Goals (SDGs).
57	**MUHS RESEARCH POLICY:** The 'Central Research Policy' provides a framework for design, management and implementation of research and for development a infrastructure for research related activities in the University and its affiliated organizations. It is aimed to inculcate the culture of research and to enhance attitude of innovation, incubation, and implementation of robust research among the academic fraternity of the University. Mission

	To cultivate and develop research scientists who create and apply knowledge to enhance the quality of health of individuals and communities. To create a conducive ecosystem for excellence in research amongst the academic and medical fraternity. Vision To Pursue excellence in health care through innovative research and education contributing to implementation of affordable systems to improve and transform health care worldwide. Values: To inculcate following values in research scholars: Integrity: Maintain professional, ethical, and honest practices in all research activities. Originality: Develop and maintain originality in research work and to prevent plagiarism. Excellence: Pursue the highest standards in research, teaching, and service. Learning: Continuously evaluate and improve research through the creation and use of rational approaches and innovative ideas. Inclusiveness: Respect cultural values and diversity, maintain dignity and respect for all, and build an environment as diverse as the challenges and opportunities facing health care. Collaboration: Establish relationships across disciplines and the various communities being served, and incorporate multiple perspectives into research, teaching, and health care. Equity: Equal opportunity of participation to all involved and to be open to ideas of research from any one. Commitment: Commitment by all to serve the needs of the entire population, regardless of differences or circumstances, and address the barriers and disparities that hinder people's ability to lead healthy lives through research, teaching, and health care.
58	**EMERGENCY HEALTH CARE MANAGEMENT SKILLS:** Management of emergencies is an integral part of primary care. Being first contact care providers general practitioners may encounter any type of emergency. Acute attacks of asthma, myocardial infarction, anaphylactic shock, hypoglycemic coma, convulsions, head injuries and trauma are some of the common emergencies encountered by GPs. Updated knowledge, communication and procedural skills, trained paramedical staff, necessary equipment and medications and appropriate practice organization are vital to provide optimum care which may even save lives of patients. The wide range of problems and the rarity of the problems make it difficult for primary care doctors to be updated and competent in providing emergency care. The primary care medical center can be patient friendly by having contact details of available ambulance services and other vehicles. This

	would help to minimize the delay in transferring a patient to the hospital. The primary care physicians can co-ordinate care by informing the hospital about the condition of the patient. Then the hospital would be ready to receive the patient and crucial delays could be avoided. It's important to write a referral letter mentioning the essential items of information such as the probable diagnosis (myocardial infarction), present status (blood pressure, pulse rate and rhythm), investigation findings (ECG changes), treatment administered (aspirin), co-morbidities (asthma, diabetes mellitus), treatment for co-morbidities, drug allergies and other relevant information which would be vital for the assessment, diagnosis and the management of the patient. It is extremely important to make the family and care givers aware why patient is referred and the need for prompt admission to avoid undue delays such as seeking second opinion from another doctor or neglecting the problem such as mild discomfort in the chest due to myocardial infarction by a diabetic patient. Advising patients not to take anything orally in situations such as torsion of the testis, ectopic pregnancy and to minimize physical exertion such as walking in patients having myocardial infarction are also important part of pre-hospital care. GPs can carry out opportunistic health promotion by displaying posters regarding symptoms of medical emergencies, features of early recognition and first aid measures that should be practiced. Doctors should educate patients who are susceptible to emergencies such as hypoglycemic and hyperglycemic attacks about prevention, early detection of impending attacks and measures to be adopted in such situations. Attending to emergency medical problems is a responsibility of primary care doctors and they should be armed with knowledge, skills, staff, practice organization, equipment and medications to manage patients effectively which may even be lifesaving.
59	**HEALTH EDUCATION : OSTEOPOROSIS** Disease of skeletal system characterized by progressive weakening of bones leading to major fractures without fall, accident or trauma. Exponential growth in the global prevalence of this disease despite rapid advances in diagnostics and therapeutics have brought this disorder to the forefront of public awareness. Lack of awareness have dragged India to miserably exist among the countries reporting high prevalence of osteoporosis and its consequent fractures. With 10 million cases per year, India is heading for a dangerous upsurge of osteoporotic cases in years to come. Social conscience and responsibility have driven us to initiate a major public awareness campaign focusing our operation in rural areas as the population there is devoid of modes of information and technology. The objective of empowering women with knowledge to fight against osteoporosis is accomplished through a well-designed programme called HEATCO (Health Education and Tele-consultation on Osteoporosis). It involves BMD

	(Bone Mineral Density) estimation of rural women, educating them by telecommunication and virtual consultation to severely osteoporotic women by video conferencing. The completion of project in 51 villages till now have though given significant measurable outcome but not without practical difficulties mainly due to frequent power failures, internet disconnectivity and improper locations To overcome these difficulties for future projects we have recently refabricated a unique, very well designed, all pervasive osteoporosis awareness campaign van named as HEATCO van. This van is a refabricated vehicle, specially designed with an impressive exterior displaying text, slogans and images for understanding osteoporosis which cause everlasting impact on minds of viewers. A huge TV screen on the exterior of van is a special point of attraction as it facilitates people to listen to me live from my hospital. The automatically emerging canopy from top of the van ensures secure environment and shelter. The interior of the van is no lesser than a fully air-conditioned exhibition hall with attractive digital images and text simplifying the understanding of osteoporosis. The live demonstration of course of osteoporosis on human bones is a special attraction. It has a scan machine for BMD estimation and digital images on requirement of calcium and vitamin D based upon the BMD value. The digital information chart of sources of calcium and vitamin D makes the viewer fully knowledgeable. The special feature of the van is a small chamber from where the viewer can directly interact with me through video conferencing. All throughout her sojourn inside the van, different videos highlighting important consequences of osteoporosis on small TV screen distinguishing. A beautiful song specially composed on osteoporosis are mesmerises the viewers and creates an emotional impact on the mind. Overall this van is unique and first of its kind in world as it encompass all modes of education.
60	**UTILITYOF MOLECULAR GENETICS IN CLINICAL PRACTIC** While there has been much debate about the coverage and quality of Wikipedia (starting with an article in 2005 , there is no doubt about its value (and increasing role) as a reference source and starting point for in-depth research. For example, within the biomedical sciences, there have been recent articles about the accuracy and completeness of drug information in Wikipedia], Wikipedia as a source of information in nursing care and mental disorders [, and making biological databases available through Wikipedia. Is this the case for computational biology as well? Probably yes; however, at present our profession seems to gain more than it gives. We suggest a principal reason for this limited breadth and depth of coverage of topics in computational biology is one that affects a number of disciplines: reward. Authors in the biomedical sciences get academic reward for publishing papers in reputable journals that are indexed in PubMed and have associated digital

	object identifiers (DOIs). In contrast, contributions to Wikipedia can be anonymous and do not count for much in the current system of academic advancement. We hope to help to resolve this disparity in PLoS Computational Biology.
61	**UTILITY OF CYTOGENETICS IN CLINICAL PRACTICE** While preclinical stroke studies have shown that mesenchymal stem cells (MSCs) promote recovery, few randomized controlled trials (RCT) have assessed cell therapy in humans. In this RCT, we assessed the safety, feasibility, and efficacy of intravenous autologous bone marrow-derived MSCs in subacute stroke. ISIS-HERMES was a single-center, open-label RCT, with a 2-year follow-up. We enrolled patients aged 18–70 years less than 2 weeks following moderate-severe ischemic carotid stroke. Patients were randomized 2:1 to receive intravenous MSCs or not. Primary outcomes assessed feasibility and safety. Secondary outcomes assessed global and motor recovery. Passive wrist movement functional MRI (fMRI) activity in primary motor cortex (MI) was employed as a motor recovery biomarker. We compared “treated” and “control” groups using as-treated analyses. Of 31 enrolled patients, 16 patients received MSCs. Treatment feasibility was 80%, and there were 10 and 16 adverse events in treated patients, and 12 and 24 in controls at 6-month and 2-year follow-up, respectively.
63	**CHRONIC/COMPLEX INFECTIOUS DISEASES** Personalized medicine is variably defined as a new system aimed at providing optimal medical care by using comprehensive pathophysiology-based information on all aspects and components of a disease process to prevent, diagnose and treat in ways that are custom-made for the individual patient. The need for personalized medicine derives from the realization that today's most challenging medical conditions are chronic complex diseases with multiple pathogenic components that interact with each other. Complexity and interaction together create unique molecular pathways that are only relevant to certain disease subtypes, but not to the entire population of patients with the same diagnosis. Thus, complex diseases cannot be properly controlled, and much less cured, by modulating single components at sporadic time points in the course of the disease or administering the same treatment to all patients, as we currently do in the management of inflammatory bowel disease (IBD). The implementation of personalized medicine requires entirely novel and methodologically sophisticated bioinformatics-based approaches that use comprehensive and detailed information on the various components (‘omes') of the disease

	process. This requires identifying the key controllers (‘hubs') of pathogenic pathways in a totally unbiased fashion and discovering highly specific agents that can selectively block or even revert pathogenic events.
64	**COMPUTATIONAL AND STATISTICAL GENOMICS** The advent of massively parallel sequencing (MPS) technology has lead to the development of assays which facilitate the study of epigenomics and genomics at the genome-wide level. However, the computational burden resulting from the need to store and process the gigbytes of data streaming from sequencing machines, in addition to collecting metadata and returning data to users, is becoming a major issue for both sequencing cores and users alike. We present WASP, a LIMS system designed to automate MPS data pre-processing and analysis. WASP integrates a user-friendly MediaWiki front end, a network file system (NFS) and MySQL database for recording experimental data and metadata, plus a multi-node cluster for data processing. The workflow includes capture of sample submission information to the database using web forms on the wiki, recording of core facility operations on samples and linking of samples to flowcells in the database followed by automatic processing of sequence data and running of data analysis pipelines following the sequence run. WASP currently supports MPS using the Illumina GaIIx.
65	**BIOMEDICAL ENGINEERING** Additive Manufacturing (AM) technologies, technologies that produce three-dimensional parts layer by layer from a material, have the potential to revolutionize the paradigm of manufacturing. Furthermore, in recent years AM technologies have sparked intense interest for developing medical implants, devices, and scaffolds. In this context, the main objective of this article is to present an overall view of the trends and the impact of the research carried out in AM technologies for biomedical engineering applications. Therefore, to achieve the main objective, a research trend and scientific impact analysis model was designed and implemented, to carry out a bibliometric indicator analysis, in general, and a web indicator analysis, in particular. The findings obtained will advance the means of visualizing the state of research in AM for biomedical engineering technologies.

66	**HEALTH TECHNOLOGY** We searched for all controlled trials of mobile technology-based health interventions delivered to health care consumers using MEDLINE, EMBASE, PsycINFO, Global Health, Web of Science, Cochrane Library, UK NHS HTA (Jan 1990–Sept 2010). Two authors extracted data on allocation concealment, allocation sequence, blinding, completeness of follow-up, and measures of effect. We calculated effect estimates and used random effects meta-analysis. We identified 75 trials. Fifty-nine trials investigated the use of mobile technologies to improve disease management and 26 trials investigated their use to change health behaviours. Nearly all trials were conducted in high-income countries. Four trials had a low risk of bias. Two trials of disease management had low risk of bias; in one, antiretroviral (ART) adherence, use of text messages reduced high viral load (>400 copies), with a relative risk (RR) of 0.85 (95% CI 0.72–0.99), but no statistically significant benefit on mortality (RR 0.79 [95% CI 0.47–1.32]). In a second, a PDA based intervention increased scores for perceived self care agency in lung transplant patients. Two trials of health behaviour management had low risk of bias. The pooled effect of text messaging smoking cessation support on biochemically verified smoking cessation was (RR 2.16 [95% CI 1.77–2.62]).
67	**BIO-INSTRUMENTATION** For a developing and largely populated country, it is quite difficult to solve all healthcare related issues using existing technology with affordable cost and desired precision. Moreover, to carry out biomedical research and design to improve biomedical equipment, devices and maintenance are usually very expensive. Thus, it is imperative and possible to extent indigenous technologies and raw materials for the research activities to design and develop sustained biomedical devices and equipment, artificial organ and tissue, prosthetics and implants, image modalities and healthcare related software at low-cost. Thus, the research and study related to biomedical engineering need to improve to understand the role and impact of this subject as a discipline.
68	**RESEARCH IN AYURVEDA, UNANI & HOMOEOPATHY** Gynaecological disorder is one of the most severe conditions under reproductive health. So we investigate and collect information from traditional practitioners on the use of medicinal plants for treatment of Gynaecological

	disorder in Vedaranyam taluk, Nagappattinam district of South India. The field study was carried out for a period of January 2014–January 2015 in Vedaranyam taluk, Nagappattinam district of South India. This is the first traditional medicine study in which statistical calculations about plants are done by RFC, CI, UV and ICF in the study area. The ethnomedicinal information was collected through interviews, informal meetings, open and group discussions and overt observations with semi-structured questionnaires among traditional practitioners. A total of 66 species of plants distributed in 62 genera belonging to 44 families were identified as commonly used ethno medicinal plants by traditional practitioners in Vedaranyam taluk for the treatment of 36 ailments based on the reproductive systems treated. Leaves were the most frequently used plant parts and most of the medicines were prepared in the form of paste and administrated orally. We know the most important species according to their use value such as Moringa oleifera, *Smailax zeylanica* and *Achyranthes aspera* were recorded. The present study, we have highlighted some claims which are high use in the study area. Further pharmacological studies of these plants may provide some important drugs for the treatment of common gynaecological disorders.
69	**START UP IN AYURVEDA** increasingly prominent in online search results, serving as an initial path for the public to access "facts," and lending plausibility to its autobiographical claim to be "the sum of all human knowledge." However, this self-conception elides Wikipedia's role as the world's largest online site of encyclopedic knowledge production. A repository for established facts, Wikipedia is also a social space in which the facts themselves are decided. As a community, Wikipedia is guided by the five pillars—principles that inform and undergird the prevailing epistemic and social norms and practices for Wikipedia participation and contributions. We contend these pillars lend structural support to and help entrench Wikipedia's gender gap as well as its lack of diversity in both participation and content. In upholding these pillars, Wikipedians may unknowingly undermine otherwise reasonable calls for inclusivity, subsequently reproducing systemic biases. We propose an alternative set of pillars developed through the lens of feminist epistemology, drawing on Lorraine Code's notion of epistemic responsibility and Helen Longino's notion of procedural objectivity. Our aim is not only to reduce bias, but also to make Wikipedia a more robust, reliable, and transparent site for knowledge production.

[70]	**DIGITAL HEALTH** We aim to evaluate the associations between digital health literacy (DHL) related to COVID-19 and online information-seeking behavior among university students. Methods: A total of 3.084 students (75.7% women), with an average age of 24.2 (SD = 7.5) participated in this cross-sectional study, most of whom (36.5%) were from social sciences and pursued a bachelor's degree (50.7%). Data on COVID-19-related DHL and online information-seeking behavior were collected using an online questionnaire. Logistic regression models were performed. Results: As the pandemic progressed, participants showed a lower chance of achieving a sufficient DHL (OR = 0.7; 95% CI = 0.6; 0.9). Using search engines more often (e.g., Google) (OR = 0.7; 95% CI = 0.5; 0.9), Wikipedia (OR = 0.7; 95% CI = 0.6; 0.9) and social media (e.g., Facebook) (OR = 0.7; 95% CI = 0.6; 0.9) decreased the likelihood of achieving sufficient DHL related to COVID-19. More frequent use of websites of public bodies (OR = 1.7; 95% CI = 1.1; 2.5) increased the odds of reporting sufficient DHL. Conclusion: DHL is associated with university students' online information-seeking behavior in the time of COVID-19. From a community and public health perspective, programs aiming at improving DHL should be highlighted.
[71]	**PATIENT CARE APPLICATIONS, SKILL, LAB, DIGITAL HEALTH** Processes of communication that guide decision making among clinicians collaboratively caring for complex patients are poorly understood and vary based on local contexts. In this paper, the authors characterize these processes and propose a wiki-style communication model to improve coordination of decision making among clinicians using an integrated electronic health record (EHR). Methods . A narrative review of current patterns of communication among clinicians sharing medical decisions focusing on the emerging and potential roles of EHRs to enhance communication among clinicians caring for complex patients. Results . The authors present the taxonomy of decision making and communication among clinicians caring for complex patients. They then adapt wiki-style communication to propose a novel model of communication among clinicians for decision making within multidisciplinary disease management programs. Future innovations using wiki-style communication among clinicians are also described and placed in the context of medical decisions by clinicians working together in disease management programs. Conclusions . EHR-based wiki-style applications may have the potential to improve communication and care coordination among clinicians caring for complex patients. This could lead to improved quality and safety within multidisciplinary disease management programs.

72	**SKILL LAB** Many lecturers are unhappy because their students refer to Wikipedia in their academic assignments. Rather than despairing, however, it is possible to use Wikipedia as an incentive to improve students' writing and research skills. The following case study used an established Research Skills Development framework combined with a Personal Development Plan to assess the improvement in research and academic literacy skills which students attributed to an assignment in which they wrote entries for potential uploading to Wikipedia. The participants (n=11) were students enrolled in a semester-long academic literacy course in a preparatory program for study at an Australian university. Scaffolding was provided by the lecturer at all stages of the assignment, including help with database searching, referencing and academic writing style. Although the sample size was small, quantitative data showed an educationally statistical improvement in the students' research skills, while qualitative comments revealed that despite some technical difficulties in using the Wikipedia site, many students valued the opportunity to write for a 'real' audience and not just for a lecturer.
73	**MICRO DENTISTRY** This paper examines the effect of norms and rules on editor communicative behaviour in Wikipedia. Specifically, processes of micro-coordination through speech acts are examined as a basis for norm establishment, maintenance, reinforcement and effectiveness. This is pursued by analysing discussion pages taken from a sample of controversial and featured articles. The results reveal some unexpected patterns. Despite the Wikipedia community generating a large number of rules, etiquettes and guidelines, the explicit invocation of rules and/or the use of wider social norms is rare and appears to play a very small role in influencing editor behaviour. The emergent pattern of communicative exchange is not well aligned either with rules established by Wikipedia contributors or with the characteristics of a coherent community and nor is it consistent with the behaviour needed to reach agreement on controversial topics. The paper concludes by offering some tentative hypotheses as to why this may be so and outlines possible future research which may help distinguish between alternatives.

74	**ORAL IMPANTOLOGY** As an integral part of dental practice, oral implant therapy has been accepted worldwide and become increasing important over the past few years. However, the placement of implants is not without risk due to anatomically complex operation sites in the cranio-maxillofacial region. Currently, there is a trend towards computer-aided implant surgery. In this study, a comprehensive preoperative planning and virtual training system is developed on the basis of the force feedback haptic device (Omega.6), immersive workbench (Display 300), and the software toolkit of CHAI3D. With the use of this system, the resulting data of the preoperative planning can be transferred, and surgical simulation of the plan can be vividly realized. In this way, the surgeon can grasp the feeling of osteotomy procedure, gain experience and therefore improve his skills during the actual dental implant surgery. This pilot study proves helpful for the inexperienced surgeons; however, more clinical cases will be conducted to demonstrate its feasibility and reliability.
75	**GENETICS PUBLIC HEALTH NUTRITION** Bioinformatics has been established as an important scientific discipline, bringing about a paradigm shift in various disciplines including molecular medicine, comparative genomics, molecular evolution, microbial genome applications, drug discovery and biotechnology. However, its applicability in the food science arena is less appreciated, despite the recognised potential for a significant contribution to this field (Desiere, German, Watzke, Pfeifer, & Saguy, 2001). In this review, we highlight instances where bioinformatics has been successfully applied in food and nutrition sciences to advance and expand research. Various factors, such as allergenicity, flavour, functionality, probiotics and prebiotics, influencing both food scientists and industry alike, are outlined. Additionally, we will discuss how the use of bioinformatics in food is still in its infancy, and therefore propose the concept of a Food-Wiki database (FoodWikiDB). In this new database, food and nutritional information will be stored in a consensus style, making the utilisation of this immense amount of data possible and easily managed by bioinformatic strategies and protocols. We feel such a resource will advance and develop food and nutritional sciences, with a view to improving the quality and nutritive value of food sources.
76	**GENE HEALTH** Open biological data are distributed over many resources making them challenging to integrate, to update and to disseminate quickly. Wikidata is a growing, open community database which can serve this purpose and also

	provides tight integration with Wikipedia. In order to improve the state of biological data, facilitate data management and dissemination, we imported all human and mouse genes, and all human and mouse proteins into Wikidata. In total, 59 721 human genes and 73 355 mouse genes have been imported from NCBI and 27 306 human proteins and 16 728 mouse proteins have been imported from the Swissprot subset of UniProt. As Wikidata is open and can be edited by anybody, our corpus of imported data serves as the starting point for integration of further data by scientists, the Wikidata community and citizen scientists alike. The first use case for these data is to populate Wikipedia Gene Wiki infoboxes directly from Wikidata with the data integrated above. This enables immediate updates of the Gene Wiki infoboxes as soon as the data in Wikidata are modified. Although Gene Wiki pages are currently only on the English language version of Wikipedia, the multilingual nature of Wikidata allows for usage of the data we imported in all 280 different language Wikipedias. Apart from the Gene Wiki infobox use case, a SPARQL endpoint and exporting functionality to several standard formats (e.g. JSON, XML) enable use of the data by scientists.
77	**DRUG TESTING LABORATORY** Apart from the symptoms of the disease, homeopaths may use aspects of the patient's physical and psychological state to select between treatments.Homeopathic reference books known as repertories are then consulted, and a remedy selected based on the index of symptoms. Homeopathic remedies are generally considered safe, with rare exceptions.[However, homeopaths have been criticized for putting patients at risk with advice to avoid conventional medicine, such as vaccinations,anti-malarial drugs, and antibiotics. In many countries, the laws that govern the regulation and testing of conventional drugs do not apply to homeopathic remedies. Homeopathy has been the target of numerous criticisms. Claims of homeopathy's efficacy beyond the placebo effect are unsupported by the collective weight of scientific and clinical evidence. Specific pharmacological effect with no active molecules is scientifically implausible
78	**PUBLIC HEALTH** The Internet has become an important health information resource for patients and the general public. Wikipedia, a collaboratively written Web-based encyclopedia, has become the dominant online reference work. It is usually among the top results of search engine queries, including when medical information is sought. Since April 2004, editors have formed a group called WikiProject Medicine to coordinate and discuss the English-language

	Wikipedia's medical content. This paper, written by members of the WikiProject Medicine, discusses the intricacies, strengths, and weaknesses of Wikipedia as a source of health information and compares it with other medical wikis. Medical professionals, their societies, patient groups, and institutions can help improve Wikipedia's health-related entries. Several examples of partnerships already show that there is enthusiasm to strengthen Wikipedia's biomedical content. Given its unique global reach, we believe its possibilities for use as a tool for worldwide health promotion are underestimated. We invite the medical community to join in editing Wikipedia, with the goal of providing people with free access to reliable, understandable, and up-to-date health information.
79	**DRUG ANALYSIS** The online resource Wikipedia is increasingly used by students for knowledge acquisition and learning. However, the lack of a formal editorial review and the heterogeneous expertise of contributors often results in skepticism by educators whether Wikipedia should be recommended to students as an information source. In this study we systematically analyzed the accuracy and completeness of drug information in the German and English language versions of Wikipedia in comparison to standard textbooks of pharmacology. In addition, references, revision history and readability were evaluated. Analysis of readability was performed using the Amstad readability index and the Erste Wiener Sachtextformel. The data on indication, mechanism of action, pharmacokinetics, adverse effects and contraindications for 100 curricular drugs were retrieved from standard German textbooks of general pharmacology and compared with the corresponding articles in the German language version of Wikipedia.
80	**COSMETIC TECHNOLOGY** This study reports on attention to meaning among 40 NNS pre-service EFL teachers as they collaboratively constructed a wiki in a 16-week online course. Focus is placed upon the nature of individual and group behavior when attending to meaning in a long-term wiki-based collaborative activity as well as the students' collaborative autonomous language learning abilities. Phases of group collaboration as well as individual language acts were analyzed. Student interaction and language use appear to benefit from flexible learning environments although student use of these spaces may not be consistent with instructor expectations. More important than the quality of the final wiki is the process students engage in as they write collaboratively. The paper concludes with a proposed framework for CALL research and practice.

81	**AYURVED AND PANCHKARMA TREATMENT** Panchakarma (Five fold therapeutic methods of Ayurveda) has immense potential in the context of tackling the lifestyle disorders with special reference to Madhumeha (Diabetes Mellitus). Ayurvedic Panchakarma procedures have been becoming popular of late and its usefulness in prevention and management of lifestyle disorders especially the Madhumeha may be one of the reason. It is therefore essential to recognize the potential of Panchakarma therapy of Ayurveda and convert into mainstream treatment. As a prelude to this, an attempt has been made to present the Ayurvedic textual references describing the multidimensional utility of Panchakarma especially the shodhana (Purificatory therapeutic methods of Ayurveda) in the prevention and management of Madhumeha. Efforts have been also made to hypothesize the mode of action of this therapeutic plan. It is proposed that prior to pharmacological intervention i.e., either Ayurveda or modern anti-diabetic management, shodhana might be extremely useful in terms of rendering the body highly responsive to the interventional methods. Potential areas of research have also been suggested
82	**COMMUNICATION AND LEADERSHIP SKILLS** This chapter examines the opportunities and barriers of promoting students' learning skills, including communication, cooperation, collaboration and connection using the Wiki tool under the blackboard platform. A Wiki tool was implemented in two postgraduate units in an Australian university to develop and improve students' professional and personal skills, i.e. communication, leadership, time management, problem-solving and decision-making. A Wiki tool becomes essential in teaching and learning, to promote students' skills, and control their own learning and access to knowledge, cutting-edge technology and news nationally and internationally. To implement this for students in developed and developing countries, universities and the higher education sector must recognize and achieve the Millennium Development Goals (MDG) which were signed by 189 United Nation member states in September 2000, the second goal of which is related to education. This chapter provides empirical evidence, gathered through mixed methods, from 88 students who have been exposed to Wiki as a teaching tool. Student's feedback indicates that the use of Wiki in the higher education setting is valuable and gratifying as it enables students to develop and enhance several skills, including communication, collaboration, interpersonal, writing, reading, and search/research, problem-solving and decision-making, all of which are required for both their current studies and their futures in the real-world workplace.

83	**MENTAL HEALTH & WELLBEING** Indigenous people have a right to culturally responsive secure inpatient forensic mental health services (FMHS). Yet, there is a paucity of literature highlighting such facilities. This study aims to provide an exemplar of a culturally responsive Māori minimum secure unit for the indigenous people (Māori) of Aotearoa (New Zealand). A Māori research approach (Kaupapa Māori research) was used to highlight the voice of tāngata whai i te ora (service users), their whānau (family), and Māori kaimahi (staff), to describe life in this service. Personal recovery-oriented care was evident emphasizing developing a sense of cultural identity. This approach was attached to a focus on collective identity to enable people to gain skills to thrive within their whānau, once living in the community. This was achieved through a combination of embedding Māori values and practices into daily life, coupled with a blending of culturally specific and evidence-based programmes. Despite the significant gains demonstrated through the development of this culturally responsive unit, challenges to progress exist. Māori leadership to the unit has been eroded, but those interviewed expressed resolve to navigate a solution. This exemplar provides an international impetus for cultural transformation to meet the needs of indigenous peoples in FMHS.
84	**BASIC PROCEDURES IN OPHTHALMOLOGY** We provide a comparative analysis of the references to books in two free online encyclopedias that have very different philosophies about authorship and editorial oversight that may affect the nature and academic respectability of the books they list. These encyclopedias are the loosely edited, non-refereed Wikipedia, where anonymous authors, whose credentials are uncertain, compile the reference list and where many equally anonymous readers can later alter the reference lists, and its peer-reviewed companion Scholarpedia, which features signed articles by invited experts who control its reference lists. We compared 47 entries dealing with the brain or behavioral sciences that had exactly matching titles. We report relative number of book references overall, the age of these references, and those titles that were multiply cited, either through citations in both online encyclopedias or multiple entries in either one of them. We compare the percentages of book references allotted to matching subject categories. We note the distributions of references according to book publishers and compare propensities for citing high-level research volumes versus introductory textbooks and popularizations. Finally, we examine the credentials of the authors of the cited works, providing information on the universities and disciplines in which their authors or editors received their doctoral degrees and their most current academic or professional affiliation. We conclude that in this comparison of a small but carefully matched set of entries in the brain and

	behavioral sciences, both encyclopedias offer references to solid materials and that any differences in quality indicators represent matters of degree rather than any clear-cut advantage that is exclusive to one or the other.
85	**ADVANCES IN OPHTHALMOLOGY** The purpose of this article is to summarize the resurgence in interest to prolong and improve drug entry from topical administration. These approaches include mucoadhesives, viscous polymer vehicles, transporter-targeted prodrug design, receptor-targeted functionalized nanoparticles, iontophoresis, punctal plug and contact lens delivery systems. A few of these delivery systems might be useful in treating diseases affecting the back of the eye. Their effectiveness will be compared against intravitreal implants (upper bound of effectiveness) and trans-scleral systems (lower bound of effectiveness). Refining the animal model by incorporating the latest advances in microdialysis and imaging technology is key to expanding the knowledge central to the design, testing and evaluation of the next generation of innovative ocular drug delivery systems.
86	**INTRODUCTION TO HEALTH CARE** Health care administrative data are generated at every encounter with the health care system, whether through a visit to a physician's office, a diagnostic procedure, an admission to hospital, or receipt of a prescription at a community pharmacy. The terms "health care utilization data", "administrative health care billing records", "administrative claims data", or simply "claims data" are synonymous with "health care administrative data". These data are collected for administrative or billing purposes, yet may be leveraged to study health care delivery, benefits, harms, and costs. Pharmacists play a key role in the health care system and may be uniquely attuned to identify important pharmacy practice and pharmacotherapy questions that can be answered with health care administrative data. However, before embarking on a new research study, a fundamental understanding of the strengths and limitations of these data for research is imperative. In this primer, we introduce the common types of health care administrative data and how they may be used to understand professional community pharmacy services, drug utilization, and drug safety and effectiveness.

87	**REVIEW OF CLASSICAL HOMEOPATHIC LITERATURE WITH PRACTICAL TRAINING OF CASE MANAGEMENT IN OPD & IPD SECTIONS.** Complementary and alternative medicine is increasingly evaluated from an evidence-based medicine perspective which includes clinical trials. It was unclear to what extent these trials represented clinical practice and assessed treatments as given in the real world. Attention deficit hyperactivity disorder (ADHD) and homeopathy were explored as an exemplar comparing clinical trials versus daily practice. Objectives: Evaluate, contrast and compare the homeopathy as practiced within research trials with the approach adopted by practitioners in their daily practice as a treatment for children diagnosed with ADHD. Methods: An explicitly mixed methods approach based in Grounded Theory spanning quantitative and qualitative research techniques was adopted for this project. Data elements included a systematic review, individual patient data meta-analysis, practitioner survey, in-depth interviews and participant-observation. Each method was rigorously implemented and analysed according to best practice; the results were then synthesised to develop an explanatory model. Results & Conclusions: Although meta-analyses suggest there is little reliable evidence in favour of homeopathy for the treatment of ADHD, the trials conducted to date do not appear to have reflected clinical practice within the UK. The diversity of practice observed presents unique challenges for researchers who wish to improve the evidence base. A model of homeopathy as a process of individualisation is offered as a starting point for documenting observational studies and developing realistic evaluations, and an outline of a future comparative trial is provided.
88	**SKILL DEVELOPMENT OF BUDDING HOMEOPATHS IN PRACTICAL CLNICAL DIMENTION** Homeopathy is widely used and broadly accepted by health care professionals and the general public but less in academic circles. To assess possible material health risks of homeopathic medicinal products, it is necessary to identify, select, and synthesize the findings of recent reviews of controlled homeopathic clinical trials. Matching these findings with experimental data from toxicological studies helps to clarify what is known and not known about the material risks of homeopathic medicines. Rules for toxicological risk assessment and management need to be applied independently of individual attitudes towards specific therapeutic options. European regulatory bodies have developed special protocols and decision trees to assure the safety of nonindividualized homeopathic remedies. This narrative review leads to suggestions that could ease and improve toxicological decision making. No homeopathy-specific type or pattern of side effects could be extracted from the meta-analysis data. No differences in the frequency of adverse reactions between homeopathic treatment and placebo treatment could be seen, no

	matter whether adverse events were reported in a quantitative or a qualitative manner. Some patterns of side effects show that adverse reactions do not necessarily correlate with treatment but with the condition of the patient.
89	**HOLISTIC AND INTEGRATED HEALTH** Reviews the range of quality activity in a National Health Service hospital trust, using a staff questionnaire survey, self-assessment against the Baldrige Quality Award criteria, and the application of the SERVQUAL approach to service quality assessment. Reviews the acute health care quality programme literature. Finds that there are needs for greater integration of quality effort, to engage with patients in a more meaningful manner, and to achieve greater commitment and involvement from clinicians and managers. Identifies lack of time and resources as a major barrier to greater application of quality programmes. Explores ways of developing a more holistic and integrated programme of quality improvement. Describes the creation and implementation of a model for continuous improvement in health care quality.
90	**OPERATIONAL RESEARCH/MEDICAL ETHICS** Among 25 wikis included, 11 aimed at building an encyclopedia, five a textbook, three lessons, two oncology protocols, one a single article, and three at reporting clinical cases. Sixteen wikis were specialized with specific themes or disciplines. Fifteen wikis were using MediaWiki software as-is, three were hosted by online wiki farms, and seven were purpose-built. Except for one MediaWiki-based site, only purpose-built platforms managed detailed user disclosures. The owners were ten organizations, six individuals, four private companies, two universities, two scientific societies, and one unknown. Among 21 open communities, 10 required users' credentials to give editing rights. The median information framework quality score was 6 out of 16 (range 0-15). Beyond this score, only one wiki had standardized peer-reviews. Physicians contributed to 22 wikis, medical learners to nine, and lay persons to four. Among 116 sampled articles, those from encyclopedic wikis had more videos, pictures, and external resources, whereas others had more posology details and better readability. The median creation year was 2007 (1997-2011), the median number of content pages was 620.5 (3-98,039), the median of revisions per article was 17.7 (3.6-180.5) and 0.015 of talk pages per article (0-0.42). Five wikis were particularly active, whereas six were declining. Two wikis have been discontinued after the completion of the study.

91	**AYURVEDA AND YOGA IN ORTOPAEDICS MANAGEMENT** IN THIS ISSUE OF SQUMJ, DR. DEEPALI JAJU and her colleagues have shown the effects of a yoga technique known as Pranayam breathing (PB) on the pulmonary system.1 These authors have demonstrated that PB has different effects on healthy controls compared to those with chronic obstructive pulmonary disease (COPD). PB invoked clear improvement in maximum inspiratory pressure (MIP) in normal controls; however, PB was not able to produce MIP changes in subjects with COPD. There was however, a significant increase in the visual analogue score (VAS) in COPD patients, which suggested reduction in respiratory distress. While the improvements were limited, and perhaps variable in different people, it does indicate that there is indeed some validity in yogic intervention. In modern parlance, health care systems outside the realm of modern biomedical sciences, also termed 'allopathic medicine', are often labelled 'traditional medicine'. The increasing acceptance of 'non-allopathic' health care systems, has led to some of them have being accepted as 'complementary and alternative medicine' (CAM). The term 'integrative medicine' has also emerged to describe the concurrent use of different healing systems to increase vitality, cure disease, or as integral part of a regimen for a healthy lifestyle or prevention of diseases.
92	**UNDERSTANDING THE DNA SEQUENCING, SEQUENCE ANALYSIS AND PHYLOGENETIC ANALYSIS** Phylogenetic hypotheses using whole genome sequences have the potential for unprecedented accuracy, yet a failure to understand issues associated with discovery bias, character sampling, and strain sampling can lead to highly erroneous conclusions. For microbial pathogens, phylogenies derived from whole genome sequences are becoming more common, as large numbers of characters distributed across entire genomes can yield extremely accurate phylogenies, particularly for strictly clonal populations. The availability of whole genomes is increasing as new sequencing technologies reduce the cost and time required for genome sequencing. Until entire sample collections can be fully sequenced, harnessing the phylogenetic power from whole genome sequences in more than a small subset of fully sequenced strains requires the integration of whole genome and partial genome genotyping data. Such integration involves discovering evolutionarily stable polymorphic characters by whole genome comparisons, then determining allelic states across a wide panel of isolates using high-throughput genotyping technologies. Here, we demonstrate how such an approach using single nucleotide polymorphisms (SNPs) yields highly accurate, but biased phylogenetic reconstructions and how the accuracy of the resulting tree is compromised by incomplete taxon and character sampling.

93	**EMERGENCY MEDICAL & TRAUMA CARE** A large proportion of trauma patients in developing countries do not have access to formal Emergency Medical Services. We sought to assess the efficacy of a program that builds on the existing, although informal, system of prehospital transport in Ghana. In that country, the majority of injured persons are transported to the hospital by some type of commercial vehicle, such as a taxi or busA total of 335 commercial drivers were trained using a 6-hour basic first aid course. The efficacy of this course was assessed by comparing the process of prehospital trauma care provided before versus after the course, as determined by self-report from the driver
94	**ANAESTHESIA** In the last decade, capnography has developed from a research instrument into a monitoring device considered to be essential during anaesthesia to ensure patient safety. Hence, a comprehensive understanding of capnography has become mandatory for the anaesthetist in charge of patients in the operating room and in the intensive care unit. This review of capnography includes the methods available to determine carbon dioxide in expired air, and an analysis of the physiology of capnograms, which are followed by a description of the applications of capnography in clinical practice. The theoretical backgrounds of the effect of barometric pressure, water vapour, nitrous oxide and other factors introducing errors in the accuracy of CO2 determination by the infra-red technique, currently the most popular method in use, are detailed. Physiological factors leading to changes in end-tidal carbon dioxide are discussed together with the clinical uses of this measurement to assess pulmonary blood flow indirectly, carbon dioxide production and adequacy of alveolar ventilation. The importance of understanding the shape of the capnogram as well as end-tidal carbon dioxide measurements is emphasized and its use in the early diagnosis of adverse events such as circuit disconnections, oesophageal intubation, defective breathing systems and hypoventilation is highlighted. Finally, the precautions required in the use and interpretation of capnography are presented with the caveat that although no instrument will replace the continuous presence of the attentive physician, end-tidal carbon dioxide monitoring can be effective in the early detection of anaesthesia-related intraoperative accidents.

95	**ABDOMINAL EXAMINATION IN PANCHABHAUTIK CHIKITSA** Datar Shastri adopted the process of diagnosis inPanchabhautik chikitsa through a special technique called Nada pariksha. Nada parikshais percussion or sound examination. It's used in addition to the famousNadi Pariksha or pulse diagnosis. In sound examination, abdominal sounds are examined on the basis of the properties of increased or depletedpanchamahabhutas (five elements) in the body giving rise to a specific symptom of a disease. Panchabhautik chikitsa is an easy method to heal chronic diseases successfully. In Ayurvedic disease diagnosis, primary importance is given to Udara Pariksha or abdominal examination. The liver (Yakrita), spleen (Pleeha) and kidneys (Mutrapinda or Vrikka) is also examined through this process.3
96	**MEDICINES PREPARATION IN PANCHABHAUTIK CHIKITSA** Datar Shastri adopted the process of diagnosis inPanchabhautik chikitsa through a special technique called Nada pariksha. Nada parikshais percussion or sound examination. It's used in addition to the famousNadi Pariksha or pulse diagnosis. In sound examination, abdominal sounds are examined on the basis of the properties of increased or depletedpanchamahabhutas (five elements) in the body giving rise to a specific symptom of a disease. Panchabhautik chikitsa is an easy method to heal chronic diseases successfully. In Ayurvedic disease diagnosis, primary importance is given to Udara Pariksha or abdominal examination. The liver (Yakrita), spleen (Pleeha) and kidneys (Mutrapinda or Vrikka) is also examined through this process.
97	**ABDOMINAL EXAMINATION IN PANCHABHAUTIK CHIKITSA** The process of analysis and treatment inPanchabhautik Chikitsa typically has the following four steps. Find out the root cause of the disease. The series of events in the attainment of a particular disease, the disease pathogenesis, is based on the Panchabhautik theory or the imbalance in the elements Analyze the present and future effects of this causative factor on other prominent systems of the body.

	Treat the imbalance, and not only the disease in question, to bring equilibrium to the elements. The body experiences weakness during this equilibrating process. Regain the strength of the body and stabilize it. Imbalance of the five elements in the human body can cause different symptoms in accordance with characteristics attributed to the imbalance. This is calledGuna Dvanda (duality of attributes).
98	**POLLUTION HEALTH HAZADRS** Ambient (outdoor) air pollution is now recognized as an important problem, both nationally and worldwide. Our scientific understanding of the spectrum of health effects of air pollution has increased, and numerous studies are finding important health effects from air pollution at levels once considered safe. Children and infants are among the most susceptible to many of the air pollutants. In addition to associations between air pollution and respiratory symptoms, asthma exacerbations, and asthma hospitalizations, recent studies have found links between air pollution and preterm birth, infant mortality, deficits in lung growth, and possibly, development of asthma. This policy statement summarizes the recent literature linking ambient air pollution to adverse health outcomes in children and includes a perspective on the current regulatory process. The statement provides advice to pediatricians on how to integrate issues regarding air quality and health into patient education and children's environmental health advocacy and concludes with recommendations to the government on promotion of effective air-pollution policies to ensure protection of children's health.
99	**CLINICAL RESEARCH IN NETRA ROGA** American Optometric Association (AOA) defines computer vision syndrome (CVS) as “Complex of eye and vision problems related to near work, which are experienced during or related to computer use”. Most studies indicate that Video Display Terminal (VDT) operators report more eye related problems than non-VDT office workers. The causes for the inefficiencies and the visual symptoms are a combination of individual visual problems and poor office ergonomics. In this clinical study on “CVS”, 151 patients were registered, out of whom 141 completed the treatment. In Group A, 45 patients had been prescribed *Triphala* eye drops; in Group B, 53 patients had been prescribed the *Triphala* eye drops and *Saptamrita Lauha* tablets internally, and in Group C, 43 patients had been prescribed the placebo eye drops and placebo tablets. In total, marked improvement was observed in 48.89, 54.71 and 06.98% patients in groups A, B and C, respectively.

100	**AYURVEDIC MANAGEMENT OF NETRA ROGA** The main sensations obtained from the sensory organs are the taste, fragrance, vision, sound, and touch. From these senses, the vision is very important and it is perceived by the eyes located in head region. Any disturbances to this area lead for the mismanagement of day to day activities. Mahasneha is widely used in the management of Urdhvajathrugatha roga because it has Snigdakaraka, Jeevana hita, Varnakaraka and Bala-pushti Vardhaka Guna. Grtha, Taila, Vasa and Majja are the four types of Mahasneha. The aim of this study was to □nd out the mostly used drug and its qualities among Chatur Sneha in treating Netra Roga. This study was carried out as a literary review. The study consisted of two steps. Primary data were collected through Bruhattrayee, while secondary study was done to □nd out the values and qualities of widely used Maha sneha and to understand the rationale behind Maha Sneha in the treatment of Netra Roga. Ayurveda and modern books and World Wide Web were used to collect secondary data. In Akshi Roga Cikitsa, according to Carakasamhita, there are 6 external applications using Grita.
101	**CLINICAL APPROCH TO AYURVEDIC PRINCIPLES** Ayurveda is a science of life with a holistic approach to health and personalized medicine. It is one of the oldest medical systems, which comprises thousands of medical concepts and hypothesis. Interestingly, Ayurveda has ability to treat many chronic diseases such as cancer, diabetes, arthritis, and asthma, which are untreatable in modern medicine. Unfortunately, due to lack of scientific validation in various concepts, this precious gift from our ancestors is trailing. Hence, evidence-based research is highly needed for global recognition and acceptance of Ayurveda, which needs further advancements in the research methodology. The present review highlights various fields of research including literary, fundamental, drug, pharmaceutical, and clinical research in Ayurveda. The review further focuses to improve the research methodology for Ayurveda with main emphasis on the fundamental research. This attempt will certainly encourage young researchers to work on various areas of research for the development and promotion of Ayurveda.
102	**HOLISTIC HEALTH CARE** Holistic healthcare is complete or total patient care that considers the physical, emotional, social, economic, and spiritual needs of the person, his or her response to illness and the effect of the illness on the ability to meet self-care needs. People with intellectual and developmental disabilities (IDD), frequently experience clinical

	comorbidities that require treatment across a range of disciplines, access a range of long term services and supports, and rely on an array of natural supports for their emotional, social and other needs. For these reasons they require coordination and integration of care that will promote improved health outcomes, improved patient satisfaction and reduced healthcare costs. Holistic health care offers the promise of multidisciplinary, coordinated whole-person care for people with IDD and seeks optimal quality of life as a principle patient outcome.
103	**REPRODUCTIVE HEALTH** Male reproductive health has deteriorated in many countries during the last few decades. In the 1990s, declining semen quality has been reported from Belgium, Denmark, France, and Great Britain. The incidence of testicular cancer has increased during the same time incidences of hypospadias and cryptorchidism also appear to be increasing. Similar reproductive problems occur in many wildlife species. There are marked geographic differences in the prevalence of male reproductive disorders. While the reasons for these differences are currently unknown, both clinical and laboratory research suggest that the adverse changes may be inter-related and have a common origin in fetal life or childhood. Exposure of the male fetus to supranormal levels of estrogens, such as diethlylstilbestrol, can result in the above-mentioned reproductive defects. The growing number of reports demonstrating that common environmental contaminants and natural factors possess estrogenic activity presents the working hypothesis that the adverse trends in male reproductive health may be, at least in part, associated with exposure to estrogenic or other hormonally active (e.g., antiandrogenic) environmental chemicals during fetal and childhood development. An extensive research program is needed to understand the extent of the problem, its underlying etiology, and the development of a strategy for prevention and intervention.
104	**LITERARY RESEARCH** Citation studies have been concerned primarily with the properties of cited workds. The analysis of citation functions is undoubtedly more complex than this, but it can reveal information about research processes. A key problem in such an analysis is the design of categories to be used to classify citation functions. A few schemes have been created for the classification of citation functions in scientific publications. This article examines these schemes and considers differences in research methods between scientific and humanistic disciplines which might have an influence on citation practices. A scheme for the classification of citations in literary research is proposed as a

	preliminary model. Findings are presented from the results of the application of this scheme to a sample of publications in German literary research.
105	**RESEARCH AYURVEDIC COSMETOLOGY & TRICHOLOGY** Hair have had its share in the aesthetic value since ages. With the modernization and increasing importance to the face value, hair care and hair beauty is gaining its share of importance. Hair is a symbol of beauty and self-confidence. From the ages, human beings want to look beautiful. There are many references in classics and history books regarding the methods of beautification and maintenance of beauty. Ayurveda teaches that beauty, health and a happy long life are achievable only by understanding how all aspects of life contributes to bring balance to the body and mind. In Ayurveda inner and outer beauty are intimately related. Outer beauty is what we most commonly consider as the field of beauty. It includes qualities such as contour of the body, texture of the skin, and the quality of the hair. Nice and good-looking long hair makes a person mentally confident and healthy indeed. Trichology is the branch of dermatology in modern medicine which works on hair problems.
106	**MEDICAL ONCOLOGY, RADIOTHERAPY, PALLLATIVE CARE** Radiotherapy is a successful, time-efficient, well-tolerated, and cost-effective intervention that is crucial for the appropriate delivery of palliative oncology care. The distinction between curative and palliative goals is blurred in many patients with cancer, requiring that treatments be chosen on the basis of factors related to the patient (ie, poor performance status, advanced age, significant weight loss, severe comorbid disease), the cancer (ie, metastatic disease, aggressive histology), or the treatment (ie, poor response to systemic therapy, previous radiotherapy). Goals may include symptom relief at the site of primary tumor or from metastatic lesions. Attention to a patient's discomfort and transportation limitations requires hypofractionated courses, when feasible. Innovative approaches include rapid response palliative care clinics as well as the formation of palliative radiotherapy specialty services in academic centers. Guidelines are providing better definitions of appropriate palliative radiotherapy interventions, and bone metastases fractionation has become the first radiotherapy quality measure accepted by the National Quality Forum. Further advances in the palliative radiation oncology subspecialty will require integration of education and training between the radiotherapy and palliative care specialties.

107	**SURGICAL ONCOLOGY** To talk about basic principles in surgical oncology, I need to explain how I arrived at them, how my experiences in surgery led me to espouse them, and how I became foolhardy enough to inflict them on you! As a psychology major at Amherst College, I only went to medical school to be a psychiatrist, but my exposure to surgery was so exciting that I considered changing plans. However, while attracted to surgery, I was also fearful of its demands. At a weekend visiting my parents, the husband of one of mother's best friends talked about how he had picked a challenging and preoccupying career to be sure that he was constantly engaged, challenged, and free of boredom. That brief snatch of conversation somehow helped convince me to launch into surgery.
108	**CARDIOLOGY, INTENSIVE CARE** Patients with acute heart failure (AHF) require urgent in-hospital treatment for relief of symptoms. The main reason for hospitalization is congestion, rather than low cardiac output. Although congestion is associated with a poor prognosis, many patients are discharged with persistent signs and symptoms of congestion and/or a high left ventricular filling pressure. Available data suggest that a pre-discharge clinical assessment of congestion is often not performed, and even when it is performed, it is not done systematically because no method to assess congestion prior to discharge has been validated. Grading congestion would be helpful for initiating and following response to therapy. We have reviewed a variety of strategies to assess congestion which should be considered in the care of patients admitted with HF. We propose a combination of available measurements of congestion. Key elements in the measurement of congestion include bedside assessment, laboratory analysis, and dynamic manoeuvres. These strategies expand by suggesting a routine assessment of congestion and a pre-discharge scoring system. A point system is used to quantify the degree of congestion. This score offers a new instrument to direct both current and investigational therapies designed to optimize volume status during and after hospitalization. In conclusion, this document reviews the available methods of evaluating congestion, provides suggestions on how to properly perform these measurements, and proposes a method to quantify the amount of congestion present.
109	**SANKE BITE MANAGEMENT IDENTIFICATION & VENOMICS & NON VENOMICS TREATMENT** Snakebite envenoming represents a neglected tropical disease that has a heavy public health impact, particularly in Asia, Africa and Latin America. A global initiative, aimed at increasing antivenom production and accessibility, is being promoted

	by the World Health Organization and others. This work discusses several aspects of antivenom manufacture and control in which the proteomic analysis of snake venoms, for which the term 'snake venomics' has been coined, might play a relevant supporting role. Snake venomics has already shown its usefulness for generating knowledge at different levels (ontogenetic, individual, and geographic) on inter- and intraspecies venom variability. This information has applications for the quality control of venom preparations used in antivenom manufacture. Moreover, the design of the best venom mixtures for immunization, aimed at increasing the effectiveness of antivenoms, may also be guided by venom proteome analysis, including molecular studies of the cross-reactivity of antivenoms and heterologous venoms through a recently developed methodological approach termed 'antivenomics'. Results generated by proteomic protocols should be complemented by preclinical testing of antivenom efficacy using functional neutralization assays. Snake venomics might be also helpful in designing alternative in vitro tests for the assessment of antivenom efficacy that would eventually substitute current in vivo tests.
110	**MINOR ORAL SURGERY (MOS)** Introduction : Dental anxiety can hinder the care and management of a patient. Music has been used in various fields of surgery to relax and distract patients. Aims : To study patient response to music during minor oral surgery (MOS), measured quantitatively and by recording physiological parameters. Design : In this pilot study, instrumental music was played for the patient via earphones during MOS treatment. Both physiological and psychological measures of anxiety were recorded using heart rate measurements, patient completed questionnaires and a subjective ten-point anxiety score. Results : Overall, the data show positive results for music and patient experience. Not only did the overall heart rate decrease over the duration of treatment, the majority of patients reported music reduced their anxiety levels (92%) and pain and discomfort. Almost half of the respondents (48%) reported music made communication with the dental team easier and 90% of patients reported that they would request to have music playing during their next dental visit

111	**INDUSTRIAL METHODS OF AYURVEDIC DRUG MANUFACTURE** Research & Development in the field of AYUSH system in different areas such as drug development including quality assurance, pre-clinical safety evaluation and clinical research are being conducted at different levels such as Research Council under AYUSH, Academic institutions (both AYUSH and non AYUSH institutes such as Medical Colleges, Universities etc.), other Research organization such as ICMR, CSIR etc. Further, research support is also being extended through grant under EMR vide Ministry of AYUSH, DST, DBT, ICMR etc. in the area of traditional medicine. Lot of research is being conducted at different levels as above in the field of AYUSH adopting different guidelines, methods and protocols and ending up research outcomes with low or poor translational value. Only few of them have led to clinical trial and marketing level. This may be attributed to lack of awareness regarding AYUSH strategies for R&D and provisions of Drug & Cosmetic Act related to AYUSH. In spite of availability of several guidelines such as GCP guidelines for ASU drugs, ICMR guidelines for biomedical research for human participants, GCP guidelines published by CDSCO Ministry of Health and Family Welfare, WHO guidelines for traditional medical research etc., there is no single comprehensive directive to conduct research in AYUSH sector is available.
112	**THERAPEUTIC YOGA IN CLINICAL PRACTICE** Medical yoga is defined as the use of yoga practices for the prevention and treatment of medical conditions. Beyond the physical elements of yoga, which are important and effective for strengthening the body, medical yoga also incorporates appropriate breathing techniques, mindfulness, and meditation in order to achieve the maximum benefits. Multiple studies have shown that yoga can positively impact the body in many ways, including helping to regulate blood glucose levels, improve musculoskeletal ailments and keeping the cardiovascular system in tune. It also has been shown to have important psychological benefits, as the practice of yoga can help to increase mental energy and positive feelings, and decrease negative feelings of aggressiveness, depression and anxiety.

113	**BASIC IN OPHTHALMOLOGY** To conclude, for me, this has really been a trabalho do coracao a phrase which does not have a correct synonym in English but when literally translated from Portuguese would mean “a work of the heart”. In truth, it is a vivid reflection of my long lasting concern and affection for my students. All books are collaborative efforts and I would like to take this opportunity to thank all the people who have advised and encouraged me in this project: specially my husband Shri Ajit Jogi, my son Aishwarya, Amit and Dr Nidhi Pandey. I offer special thanks to my publisher Shri JP Vij, Chairman and Managing Director of M/s Jaypee Brothers Medical Publishers (P) Ltd., Mr Tarun Duneja, Director (Publishing) and his staff namely Mrs Yashu Kapoor, Mr Manoj Pahuja, Mr Arun Sharma, Mr Akhilesh Kumar Dubey and Mrs Seema Dogra. By the grace of the Almighty God and with the continuing support of the teachers, I am happy to present the fourth updated edition of my book.
114	**PREVENTIVE CARDIOLOGY** Preventive cardiology is a specialty of cardiology that helps you manage heart disease risk factors before they get worse. Cardiology is a branch of internal medicine that focuses on your heart and blood vessels. So, preventive cardiology focuses on early prevention to keep your heart and blood vessels healthy. It’s a form of preventive medicine that can make a big impact on your health and well-being. You may already see a cardiologist for heart checkups. You’d keep seeing your cardiologist if you join a preventive cardiology program. But you’d also receive care and advice from providers in many different specialties. That’s because preventive cardiology takes a whole-body approach to caring for your heart. Your heart and blood vessels are team players. They work with your kidneys, endocrine system and many other “players” to keep your body going strong. But when one of the players gets injured, the whole team has to step in to help. So, a heart problem might put more work on your kidneys. Or a hormonal imbalance might lead to high blood pressure and more stress on your arteries.
115	**BASIC DENTAL IMPLANTOLOGY** Over the past decades, implant dentistry has evolved to be a very predictable treatment modality for the replacement of lost teeth and has now become one of the most common oral surgical procedures carried out worldwide. This chapter introduces the history and evolution of dental implants, discusses the concept of osseointegration, mentions the types of implants and discusses clinical decision making and execution of straight

	forward implant placement. It must be noted that the field of implantology is rapidly developing with new treatment concepts and increasing use of digital technology. The surgical part of implant treatment although extremely important, is only a part of the overall treatment, the other important factors being the laboratory and prosthodontics. This chapter only provides a basic surgical overview of implantology for the beginner surgeon clinician.
116	**MEDICAL DEVICE INNOVATION** Medical innovation touches every individual on the planet. It promises new ways to prevent, diagnose and monitor health problems, as well as new drugs and devices to manage and cure diseases. Medical innovation also means increasing knowledge and transforming existing process and business models to better serve changing needs and expectations. Big data, artificial intelligence, and other technologies are fueling a wave of health innovations around the world. In this web story we highlight insights and cases from the Global Innovation Index 2019 on the future of medical innovation.
117	**TRIBAL HEALTH RESEARCH** **About a half of the autochthonous people of the world with about 635 tribal groups and subgroups including 75 primitive tribes live in India. The state of Orissa occupies a unique position in the tribal map of India having 62 scheduled tribes including 13 primitive tribes with a population of over 8.15 million constituting 22.3% of the population of the state as per 2001 Census. There is a paucity of comprehensive health research among the tribal populations of India. Most of the studies are isolated and fragmentary in nature. There is an urgent need for initiating the area specific, tribe specific, action oriented health research in consonance with the felt needs of the tribal communities. The research should be mission oriented, having practical applications and directed towards improving the quality of life of tribal people. The health scenario of tribes of Orissa presents a kaleidoscopic mosaic of various communicable and noncommunicable diseases in consonance with socio-economic developments in the state. The wide spread poverty, illiteracy, malnutrition, absence of safe drinking water and sanitary conditions, poor maternal and child health services, ineffective coverage of national health and nutritional services, etc. are the major contributing factors for dismal health in tribal communities of Orissa.**

118	**RESEARCH METHODOLOGY & YOGA** This article addresses the under-researched, but very popular activity of yoga in contemporary Britain and attempts a preliminary sociological exploration of the religious and spiritual beliefs of yoga practitioners. A sample of dedicated practitioners of the Iyengar method of yoga was chosen for a case study. It was found that the sample practitioners are engaged in a technique that attracts a significant number of people interested in a type of 'spiritual exploration' that can probably be best explained by the concept of 'mystical religion', as introduced by Ernst Troeltsch and developed by Colin Campbell. These findings provide new salience to the idea of 'mystical religion' and a starting point for considering the role that a physical practice plays in contemporary spirituality and religiosity.
119	**NUTRITION IN HEALTH & DISEASES** Movement and nutrition play a pivotal role in the promotion of long-term health and the prevention of chronic disease. Obesity and physical inactivity are among the leading causes of premature death, while lifestyle factors such as exercise and healthy eating can reduce the risk of becoming obese and developing related diseases. Movement and nutrition may therefore be able to assist in the prevention and therapy of chronic diseases. Regular physical activity and better dietary choices are effective means of extending not only lifespan but also healthspan. Healthy nutrition is important throughout life, and diet is the most important risk factor of illness worldwide. Moreover, childhood obesity has become a global health crisis. While high body-mass index and high fasting plasma glucose contribute substantially to the rising burden of disease, they also provide promising opportunities for intervention. In addition, mounting evidence suggests vital relationships between nutritional quality and mental health. Approaches tackling dietary improvements include community-based health promotion, school-based interventions, mass media campaigns, open online platforms and policies sanctioning unhealthy food choices. The high prevalence of sedentary behavior and physical inactivity is a major health risk and a leading cause of death worldwide. The extensive health benefits of a physically active lifestyle are well established. Exercise is a viable way to help prevent and combat many chronic diseases, and an increase in physical activity could markedly improve health worldwide. A challenge in this context is the promotion of an active lifestyle, including the initiation of and adherence to effective exercise and sport programs.

120	**HEALTH AND GIS** GIS and related spatial analysis methods provide a set of tools for describing and understanding the changing spatial organization of health care, for examining its relationship to health outcomes and access, and for exploring how the delivery of health care can be improved. This review discusses recent literature on GIS and health care. It considers the use of GIS in analyzing health care need, access, and utilization; in planning and evaluating service locations; and in spatial decision support for health care delivery. The adoption of GIS by health care researchers and policy-makers will depend on access to integrated spatial data on health services utilization and outcomes and data that cut across human service systems. We also need to understand better the spatial behaviors of health care providers and consumers in the rapidly changing health care landscape and how geographic information affects these dynamic relationships.
121	**DIAGNOSTICS** In order to support the operation of ITER and the planned experimental programme an extensive set of plasma and first wall measurements will be required. The number and type of required measurements will be similar to those made on the present-day large tokamaks while the specification of the measurements—time and spatial resolutions, etc—will in some cases be more stringent. Many of the measurements will be used in the real time control of the plasma driving a requirement for very high reliability in the systems (diagnostics) that provide the measurements. The implementation of diagnostic systems on ITER is a substantial challenge. Because of the harsh environment (high levels of neutron and gamma fluxes, neutron heating, particle bombardment) diagnostic system selection and design has to cope with a range of phenomena not previously encountered in diagnostic design. Extensive design and R&D is needed to prepare the systems. In some cases the environmental difficulties are so severe that new diagnostic techniques are required. The starting point in the development of diagnostics for ITER is to define the measurement requirements and develop their justification. It is necessary to include all the plasma parameters needed to support the basic and advanced operation (including active control) of the device, machine protection and also those needed to support the physics programme. Once the requirements are defined, the appropriate (combination of) diagnostic techniques

	can be selected and their implementation onto the tokamak can be developed. The selected list of diagnostics is an important guideline for identifying dedicated research and development needs in the area of ITER diagnostics.
122	**SCIENTIFIC INSTRUMENT** A sample of one hundred and eleven scientific instrument innovations was studied to determine the roles of instrument users and instrument manufacturers in the innovation processes which culminated in the successful commercialization of those instruments. Our key finding was that approximately 80% of the innovations judged by users to offer them a significant increment in functional utility were in fact invented, prototyped and first field-tested by users of the instrument rather than by an instrument manufacturer. The role of the first commercial manufacturer of the innovative instrument in all such cases was restricted, we found, to the performance of product engineering work on the user prototype (work which improved the prototype's reliability, 'manufacturability', and convenience of operation, while leaving its principles of operation intact) and to the manufacture and sale of the resulting innovative product. Thus, this research provides the interesting picture of an industry widely regarded as innovative in which the firms comprising the industry are not in themselves necessarily innovative, but rather — in 80% of the innovations sampled — only provide the product engineering and manufacturing function for innovative instrument users.
123	**INTEGRATIVE ONCOLOGY** Background : Integrative oncology, which is generally understood to refer to the use of a combination of complementary medicine therapies in conjunction with conventional cancer treatments, has been defined in different ways, but there is no widely accepted definition. We sought to develop and establish a consensus for a comprehensive definition of the field of integrative oncology. Methods : We used a mixed-methods approach that included a literature analysis and a consensus procedure, including an interdisciplinary expert panel and surveys, to develop a comprehensive and acceptable definition for the term "integrative oncology." Results : The themes identified in the literature and from the expert discussion were condensed into a two-sentence definition. Survey respondents had very positive views on the draft definition, and their comments helped to shape the final version. The final definition for integrative oncology is: "Integrative oncology is a patient-centered, evidence-informed field of cancer care that utilizes mind and body practices, natural products, and/or lifestyle

	modifications from different traditions alongside conventional cancer treatments. Integrative oncology aims to optimize health, quality of life, and clinical outcomes across the cancer care continuum and to empower people to prevent cancer and become active participants before,during, and beyond cancer treatment.
124	**HEALTH CARE SERVICE (AYURVEDA CLINICAL PRACTICE)** Despite their historical praise, specialty studies and practices are not generally seen in current Ayurvedic education and practice. Current Ayurvedic education by and large is devoid of training programs focusing upon specialty based health care delivery. This makes many disappointed who look at Ayurveda for a focused and specialized health care. The consequences of this gap in demand and supply are alarmingly obvious. With its unfocused health care approach, the Ayurvedic health care remains generic for large section of its delivery. There are no referral settings in Ayurveda to get a higher level of care better than the one offered at a primary health care setting. This apparent lack of expertise care in Ayurveda shifts it as an alternative health care used only on the instances of failure of other trusted options. Specialty clinical practices in Ayurveda seem highly important in order to build the trust and to enhance its quality of health care delivery. Our preliminary observations from a deemed arthritis clinic at an Ayurveda teaching hospital, visited by a diverse joint disease population carves a path in this direction and proposes the possibilities of using it as a template for the qualitative improvements in Ayurvedic health care delivery in the country in various clinical areas.
125	**PHARMACOVIGILANCE IN AYURVEDA** Ayurveda, the knowledge of life, immortalized in the form of elegant Sanskrit stanzas in the *samhitas* describe diagnosis and therapy of disease as well as ways to maintain positive health.[1,2] Although the technical term “Pharmacovigilance” does not feature in ayurvedic texts, the spirit of pharmacovigilance is vibrant and is emphasized repeatedly in all major texts. The major goals of pharmacovigilance, namely to improve patient care and safety in relation to drug use, and thus promote rational drug use are recurrent themes of ayurvedic pharmacology (*dravyaguna vigyan*) and therapeutics (*chikitsa*).[3] The use of ayurvedic medicines is popular in India - and in recent times has become accepted in other countries. For example, a recent survey conducted by the NCCAM in the USA showed that about 751 000 people in the United States had ever used ayurveda and 154 000 people had used them within the past 12 months.[4] Associated with this increasing use, are growing concerns about the safety of ayurvedic medicines.[5,6] This paper discusses in brief the ayurvedic concepts of adverse

	reactions to medicines, the need for pharmacovigilance of ayurvedic medicines, challenges in introducing pharmacovigilance in ayurveda and some recommendations to successfully implementing these activities.
126	**PHYSIOTHERAPY** In recent years, physiotherapists have been increasingly interested in defining their professional identity. At the heart of this interest lies a fundamental question about the role that the body plays in defining physiotherapy practice. Given the importance of the body to physiotherapy, it is surprising how under-theorized the body is in existing physiotherapy literature. With a few notable exceptions, the body as a philosophical/theoretical construct has been almost entirely bypassed by the profession. In this paper the authors argue that a renewed interest in the meaning given to the body by physiotherapists is timely, and offer a sociohistorical critique of the role the body has played in defining physiotherapy practice. We challenge physiotherapists' longstanding affinity with a biomechanical view of the body, arguing that whilst this approach may have been critically important in the past, it is now increasingly clear that a more diverse and inclusive approach to the body will be needed in the future. The authors explore the notion of embodiment and suggest ways in which embodiment theory might be applied to physiotherapy practice.
127	**FUNDAMENTAL RESEARCH IN AYURVEDA** Research is a natural process that goes on with everything in this universe with the passage of time. By following a scientific methodology, this research can be made fruitful and beneficial to the society. The 1 first and foremost thing in research is to avoid bias in every sense . This is most important in case of Ayurveda since we use many complicated concepts to study a disease or a treatment and rely upon many subjective parameters for assessing the outcome. Hence, researches in Ayurveda, if made genuine and fruitful; the acceptance and applicability of the results are several times increased. This should be kept in mind in planning each and every research. This attitude should be reflected in our preference setting. When we set our preferences in a research process, the order must be Humanity- Medical Profession – Ayurveda – Speciality –Self. Utmost priority should be given to the mankind or the humanity. Anything which is against the humanity should be rejected in the first step itself, even though it is going to enrich the medical science. Similarly, medical profession should be given preference ahead of the individual

	system, whether it is Ayurveda or modern medicine. A lot of references are there in Ayurvedic texts which do not fit in the current scenario of clinical practice even though they were suitable for that time period.
128	**INTEGRATIVE HEALTHCARE RESEARCH** The stimulus for this paper was a recent international workshop [1] designed to clarify and define the concept of integrative health care as it applies to the combination of complementary/alternative medicine (CAM) and conventional health care. A literature review conducted for a pre-workshop background paper highlighted the diversity of thinking about integrative health care and identified that existing definitions tend to be idealistic in nature, view integrative health care as a finite outcome and as a predetermined outcome [2]. The workshop participants, however, described their own attempts at integrating CAM and conventional medicine as a developmental process along a continuum, anchored by their goal of fully integrated health care. Although the idea that a continuum of team-oriented health care practice models exists is not new, [3–5] participants suggested that if further developed, it might provide an important framework for differentiating the concept of integrative health care from other models of team-oriented health care practice. The primary objective of this paper is to develop a conceptual framework for describing, comparing and evaluating the different models of team-oriented health care practice that have evolved in Western healthcare systems. This framework will provide a context for patients and healthcare practitioners to explore what model best fits their needs; [6] and for researchers, program managers and policy makers to track the evolution of their models over time and to explore the relationship between practice models and health outcomes.