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Scope of Applications for Medical Technique at Science and Engineering

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Abstract

As an application branch of engineering and science, the medical technique has a broad range of execution. The medical devices, machines, equipment and apparatus are widely spread in use for the medical diagnosis and also treatment of the patients. Therefore, it is possible to say that medical technique is an inseparable part of medicine science.

All over the world and also at the various spaces of the universe, changing from the robotic surgery to the space medicine, there are a lot of fields of application for the medical technique. This is an interdisciplinary technique and science, gathering up researchers, academicians, engineers and scientists having different branches and expertise, i.e. mechanical engineering, electrical-electronics engineering, energy systems engineering, biomedical engineering, bioengineering, mechatronics engineering, computer engineering, chemical engineering, physics engineering, astronomy, fundamental physics and fundamental chemistry, biology, mathematics and also pharmacy, dentistry medicine and veterinary medicine.

This study has been prepared in order to explain the importance of the engineering and fundamental science branches for the implementation of medicine science through the use of the medical techniques.

Hence, this study is aimed to create awareness for the medical techniques and moreover to encourage the engineers and scientists study on those subjects. From the paper, it can also be seen obviously that the engineering technology has a great importance on the medicine science and also a great effect on the human health.

By means of introducing the below proposed areas of research in medical technique, the researchers, academicians, engineers and scientists can establish connections between the subjects of medical technique and their expertise, so they can proceed to study on those areas. After having studied on those medical technique areas defined as below, many engineers and scientists shall start to invent or develop medical devices, machines, equipment and apparatus which can provide medical diagnosis and also treatment of the patients. Moreover, these kind of researches and studies which require a multidisciplinary approach can also ensure the local production of the medical devices, machines, equipment and apparatus in our country as well as contributes the development of engineering and science in connection with a welfare economy.

Keywords: Medical technique; Engineering; Science; Bioengineering

Introduction

The aim of this article is to point out how important the engineering and basic sciences have in the implementation stages of medical science and quality health services, and as we have stated, many graduates from engineering and related basic science faculties, as well as undergraduate education in these faculties, The aim of this course is to enlighten students, academicians, faculty members and undergraduate students, even in part about medical technique, and to encourage them to work on these subjects. In our country, the number of engineers,

scientists and academicians who work on medical technique is not enough. In some countries, this number is significantly higher, as many experts from Turkey to go abroad to conduct studies on these topics. In addition, in the United States or European countries, graduate and doctorate education on "Medical Technique" is provided, so a strong scientist infrastructure trained on this subject can be established. In training on how to start graduate this issue Turkey, engineering and undergraduate level to medical school, "medical technology" required about or putting elective courses, undergraduate, medical devices, in

graduate and doctoral theses, increasing the number of students to work on medical equipment and should be encouraged the opinion is obvious.

Method, Findings and Discussion

A fact that can be determined by a scientist who has been in the profession of engineering and academia for many years can be revealed as follows: Basic engineering principles, physical and chemical laws and mathematical models designed and used for the design and production of machinery, equipment, and apparatus that serve many different purposes. In essence it is very similar to each other. In other words, physical laws and design methods that are based on the development of a device or machine that serves an industrial purpose can be used very easily to develop or manufacture a medical device or medical machine. The only difference is that a more precise calculation is made for the development and manufacture of medical machines, and the production method and tools with narrower tolerances during the production phase. When the working principle of many medical devices related to the subject is examined, this conclusion can be made. For example, while thermodynamic laws may emerge as a branch of theoretical physics that explains the thermal mobility of the universe and the world, it can also be used for industrial equipment producing heat energy and even these laws can be used for the production of a medical device. Today, there are mechanical engineer academics working on cardiovascular fluid mechanics.

All these examples show that it is important to be able to match the basic scientific laws within our profession with the working principles of the relevant medical devices and machinery and the systems connected to them. When combined with a solid theoretical know-how infrastructure and professional practice experience and systematic work, the design and production of these machines will be possible in our country. Cardiovascular, Cardiovascular Surgery, Orthopedics, General Surgery, Diagnosis - Imaging and Navigation, Neurology, Gastro-Intestinal Diseases, Ophthalmology, Internal Diseases, Oncology, Dermatology and many other medical departments in the department of health care at the stage of diagnosis and treatment of patients In the most general sense, the examples in the following paragraph can be given to give an idea for the devices and machines used.

Blood pressure measuring device, computer tomography devices, MR devices, PET / CT, x-ray devices, cardiograph devices, dialysis machines, steam autoclaves, sterilizers, artificial organs, artificial tissue, artificial blood, blood analysis devices, respiratory function device, mammography, ECG devices, various pumps, heat exchangers (heat exchangers), ultrasound devices, manometers, stethoscope surgical instruments, orthopedic implants, dental implants, chemical extraction for drug production, supercritical extraction, injectors, flow meters, refrigerators, medical refrigerators, freezers, operating table, operating room lighting and equipment, medical gas installation, operating room - hospital ventilation, patient room heating-ventilation-air conditioning devices, passive cooling systems (especially for tomography, MR devices etc.), injectors, catheter, weighing, scale, heater, patient beds, stretcher, band aj, tourniquet, anesthesia devices, ventilators, respirators, baby incubators, pacemaker systems, micropipettes, bedside monitors,

radio frequency devices, serum bags-bottles, extractors, burettes, beakers, precision scales, electric mobile surgical aspirators, electrical safety test, endoscopy devices and systems, medical device calibration, quality management system applications for the health system, heart - lung pumps, infusion and perfusion pumps, vacuum meters, surgical robots and robotic surgical systems, nanorobots, angio devices, stent manufacturing, tissue engineering products, biosensors, bone densitometers, dental and jaw x-ray and dentistry devices, electronically adjustable patient chair etc., serum pumps, hot-cold compresses, patient body heaters and coolers, lead gowns, life support units, emergency aid and ambulance vehicles and their internal Names, blood glucose meters, photodynamic therapy devices, physiotherapy devices, prosthetic leg - arm, tissue engineering applications, stem cells, implant batteries, optical imaging devices, optical diagnosis and treatment devices, devices used in eye diseases and treatment, microscope etc., acoustic diagnosis and treatment devices, image-supported therapy devices, neuro-optical stimulation devices, laboratory automation, rehabilitation robots, wheelchairs, digital modeling, virtual reality systems, wireless monitoring systems, mobile phone-network-based devices, computer-equipped devices and medical IT systems, nan-technological devices, are the examples of devices and machines frequently used in the diagnosis and treatment of patients within the scope of health services. There are also a variety of thermodynamic systems used in the fields of machinery, chemical and energy engineering, and various medical techniques used to obtain the active substances of drugs through various plants. In addition, the realization of medical technique applications is one of the most important main factors expected from the productive engineer of our age.

"Medical Technique" Many scientists going abroad from Turkey in the past year have undertaken serious issues success of our people. A team of different engineering and basic scientists have succeeded in making artificial brain tissue in an interdisciplinary study in the United States. Again, another scientist from our country who is currently working in the USA has succeeded in making an extremely low-cost portable blood test device that can easily analyze and transfer data by connecting to his mobile phone and has been awarded the young scientist of the year. Many successful studies for diagnosis and treatment for cancer and similar diseases are also ongoing. There is also a wearable pacemaker system developed and produced by a Turkish scientist working abroad. All our scientists mentioned herein, engineering and basic sciences in various branches in Turkey, whether charged, has continued graduate or complete their education are people who are moving towards an academic career.

Result

Within the scope of all the above explanations, examples and defined application areas, to be able to spread the "Medical Technique" practically in our country as an interdisciplinary engineering and science branch; Being able to design and manufacture medical devices, machinery, equipment and apparatus used in hospitals, treatment centers, institutes, universities, research institutions and homes will not only contribute to the development of engineering and science in our country, but also to advance the "Medical Technique". In addition, it will strengthen our country's economy and ensure that our level of development on a global scale will increase.

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