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Review on the Drug Dealing Robot

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Abstract: *This project expresses an idea about distribution medicines by using intelligent system which is included an information system, auto-guided vehicles (AGVs), a robot dispensing has been widely reported that a large number of patients die from cases of errors in the issuing of medication prescriptions. The increasing number of prescriptions needed to be filled daily reduces the amount of time that. The staff can use to focus on each individual prescription, which may increase the human error ratio. The Need for robotic-assisted pharmacies is arising from here to distribute drugs to eradicate or substantially Reduce human error. The pharmacy robot is one of the most significant technologies that play a prominent Role in the advancement of hospital pharmacy systems. The purpose of this review paper is to cover the Pharmacy robot concept and the published literature reporting on pharmacy robot technology as one of the Most important applications of artificial intelligence in pharmacology.*

Category: Health care technology

Keywords: Pharmacy robot, dispensing medication, hospital Pharmacy, medicine distribution.

I. INTRODUCTION

A Drug-Dealing Robot That Upends the Pharmacy Model Figuring out ways to dispense enemas might not be as glamorous as designing an app to better appreciate Eminem, but it's a more important .Nowadays, basics information technology system and human delivering management system are used in traditional dispending procedure. However, there are some problems in the working process.

1. Filling the data by handwriting onto a sheet of paper to record the stock is a big problem. It could cause mistakes or errors.
2. The recoding by staff is redundant work for them. The overload of work causes fatigue and therefore ineffectiveness. This problem would lead to delay in any step of the process.
3. A problem in medical miscounting the stock level is always found in the drug storage.
4. Overstocking in the pharmacy leads to a problem in the working area of the department.

The aim of a hospital pharmacy is to provide patients with the prescribed medication when the medication is Schedule according to the professional's instructions. However, this is not an easy task, especially with Growing patient numbers. Although patient safety and care are the ultimate and possibly only priorities, the Impact of human error in the process of issuing medication to patients can be, at times, deadly. These error Occur in various ways, such as the incorrect dosage being issued or the medication not being issued at the correct time. Nonetheless, all of these can and do have serious consequences. In addition, this is a major Logistical concern as the pharmacy delivers drugs by various dispensing methods and delivery routes to all The hospital units .

Using robots ensures a considerable decrease in the time, costs, and production of overall waste in Pharmaceutics and other biological research fields .The time needed to prepare the prescription is also One of the significant advantages of using robotic technologies. Besides, robotics reduces the percentage Of medication errors .There many different types of technologies available inside a hospital pharmacy framework that work to Enhance patient safety by reducing prescription mistakes and missing drugs. The pharmacy robot is one of The most significant technologies that play a role in the advancement of hospital pharmacy systems .

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II. BACKGROUND

2.1 What Are Artificial Intelligence and Pharmacology?

In simple terms, AI is the ability of a system, mostly computers, to act intelligently and therefore perform Tasks that would normally require human intervention. There are many things that power these systems; they can be simple things like rules, machine learning, or even deep learning Pharmacology refers to the chemicals used in the treatment of illness and disease .

2.2 What is a Robot?

Dispensing Robots automate tasks like dispensing pills, searching for medication, and managing stocklevels. They can radically change the workflow of your pharmacy. But when it comes to all the different options offered by providers, the analysis paralysis is real

Fig. Overall system of robotic drug dispensing in industrial robot

2.3 Nano Robots

The opportunities of Nanotechnology include designing Nano sized, bio responsive systems which can diagnose and then deliver drugs to the site of location. Nanotechnology is an area which is changing vision of medical science. Nanotechnology includes characterization, production and application of nanoparticles in science fields .

Mechanism of Nanorobots the research and development of Nano robots with embedded Nano biosensors and actuators is considered a new possibility to provide new medical devices for doctors. Controls are sought to effectively advance new medical technologies development of microelectronics in the 1980s has led to new tools for biomedical instrumentation . Further miniaturization towards integrated medical systems, providing efficient methodologies for pathological prognosis can be designed.The use of micro devices in surgery and medical treatments is a reality which has brought many improvements in clinical procedures in recent years . Catheterization has been successfully used as an important methodology for heart and intracranial surgery .

Medical Applications of Nanorobots -Nano robots are expected to enable new treatments for patients suffering from different diseases, and will result in a remarkable advance in the history of medicine. Nanoparticles, liposomes and dendrimers are some nanomaterials being investigated for use in Nano medicine. Nanotechnology has provided the possibility of delivering drugs to specific cells using nanoparticles.

Advantages of Nano Robots

- Nano robots will restore lost tissue at the cellular level
- Useful for monitoring, diagnosing and fighting sickness.
- Able to monitor neuro-electric signals and stimulate bodil systems.

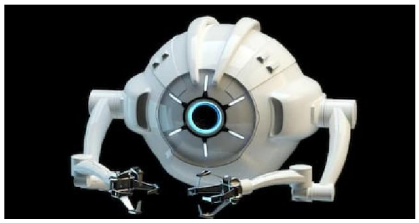

Fig. Nano Robot .

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2.4 Robot used in the Medical

Neurological-

Brain surgery involves accessing a buried target surrounded by delicate tissue, a task that benefits from the ability for Robots to make precise and accurate motions based on Medical images Thus, the first published account Investigating the use of a robot in human surgery was in 1985 for brain biopsy using a computed tomography (CT) image and a stereotactic frame. In that work, an industrial robot defined the trajectory for a biopsy by the probe oriented toward the biopsy target even As the surgeon manipulated the approach. This orientation was determined by registering a preoperative CT with the Robot via fiducials on a stereotactic frame attached to the Patient's skill.

Fig. Neurological robot.

Orthopedic Robot

The expected benefit of robot assistance in orthopedics is Accurate and precise bone resection . Through good Bone resection, robotic systems can improve Alignment of implant with bone and increase the contact Area between implant and bone, both of which may improve Functional outcomes and implant longevity . Orthopedic Robots have so far targeted the hip and knee for replacements Or resurfacing (the exception being the Renaissance system In Section 2 and its use on the spine). Initial systems required the bones to be fixed in place, and all systems use bone screws or pins to localize the surgical site.

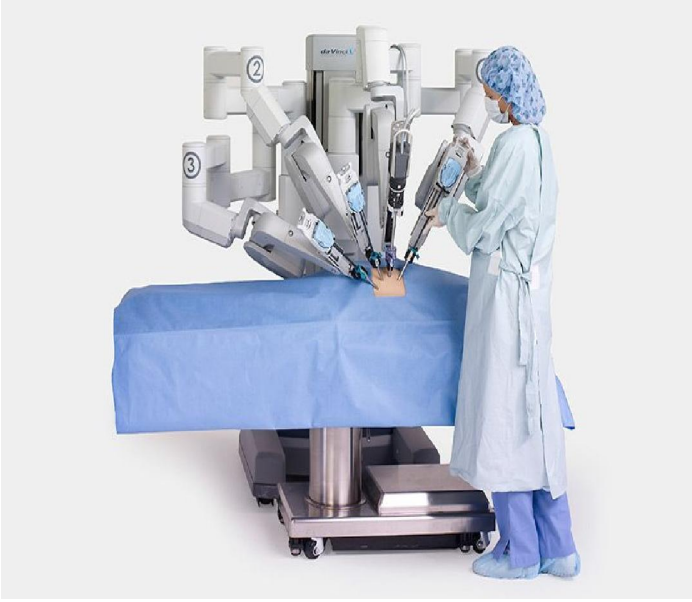

Fig. Orthopedic Robot

Robots in COVID-19

The COVID-19 disease is highly contagious which put all contacts of The patients in danger, including the medical personnel. So robots, Which are immune to infection and easy to be disinfected, are recom-Mended to play a vital role in the war against the pandemic. More Research efforts are invested in the robotic applications during the Pandemic. As the method in stage 2, i.e. Searching, defined .

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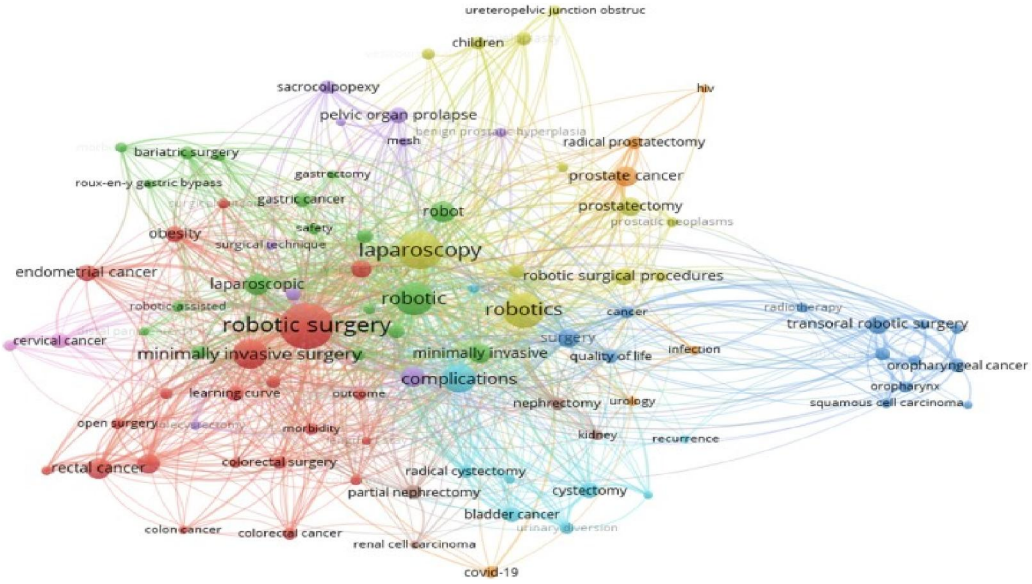
The reference collection focuses on the robotic technology for pandemic only. Until Nov 2020, there have been 280 publications in this area. The Publication statistics Before 2020, there were only several research proposals in this area. Naturally, the majority of the Papers were published in 2020 after the breakout of COVID-19. The Publication trend is compliant with the one for infectious diseases , and the number is also increasing rapidly when this literature survey is conducted



2.5 Robot in Surgery

What are Robotic Surgery?(Robot- Assisted Surgery)

Robotic surgery is the use of computer technologies working in conjunction with robot systems to perform medical procedures. The technology is also known as computer-aided surgery and robot-assisted surgery.

Robotic surgery is most often used for minimally invasive telemedicine procedures in which a physician guides the technology through a console. Typically, the surgeon is in the same room as the operating table but could potentially be across the world. The systems are also used for some open surgeries. Robotic surgery provides the surgeon with a better view, enhancing control, flexibility and precision. Benefits for the patient include lowered risk of infection, less blood loss, smaller incisions and faster recovery time.The most commonly used technology for robot-assisted surgery is the da Vinci Surgical System, which was approved by the United States FDA (Food and Drug Administration) in 2000 and has been employed in thousands of procedures since. The da Vinci SI involves miniaturized surgical instruments mounted on three robotic arms and a fourth arm with a magnified 3D camera. A console provides a view of the site for the surgeon, who manipulates the instruments through finger-operated master controls. The surgeon can select the scale for movements. In a 4-to-1 scale, for example, the tip of a robotic arm will move one inch for every four inches that the surgeon's hand moves.

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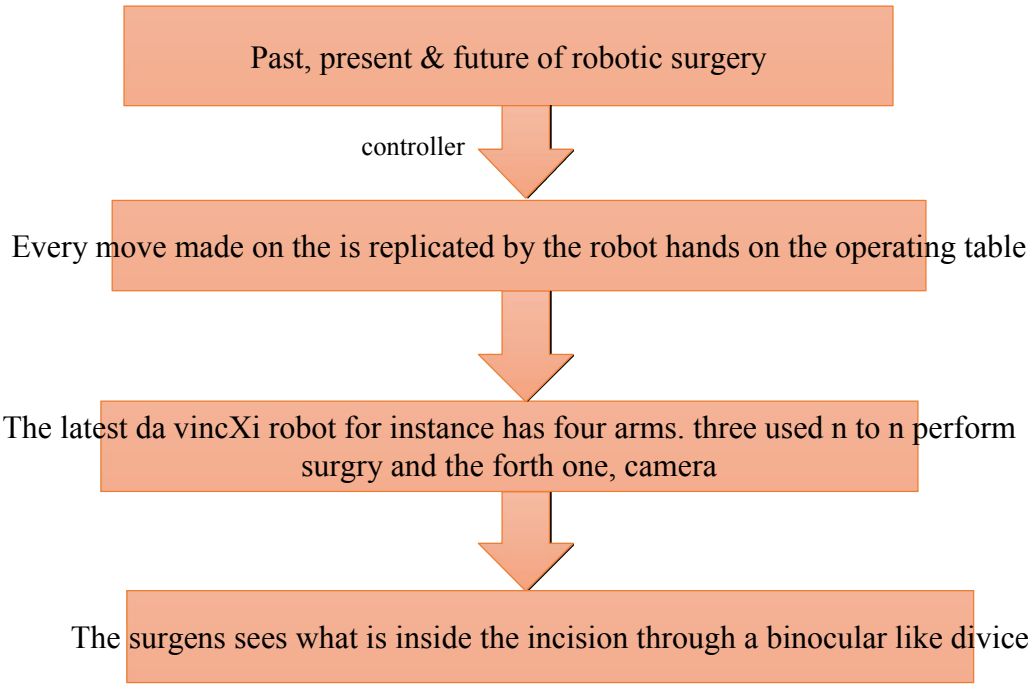
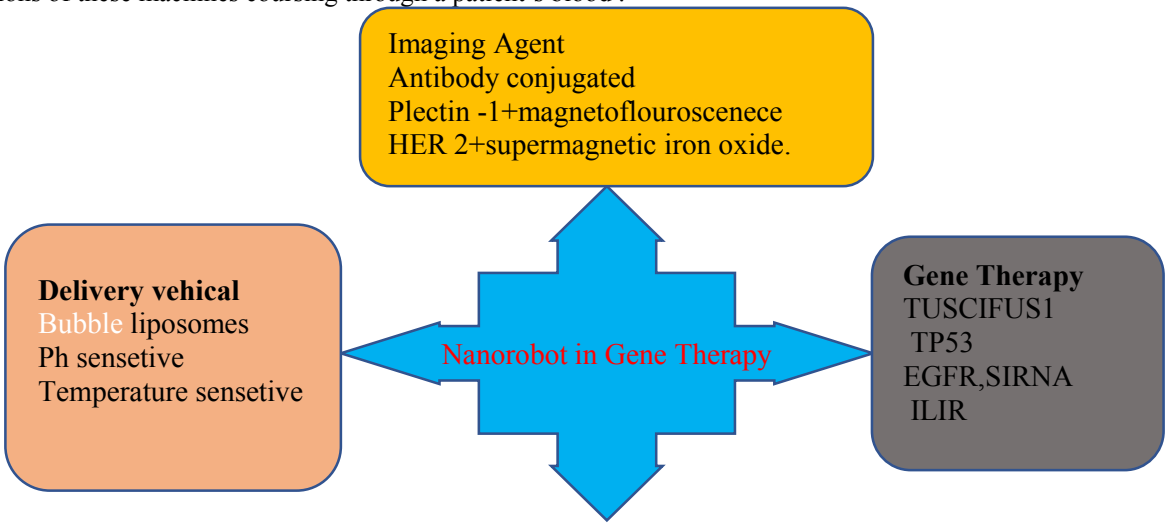
How work the Robot in Surgery



Nano Robots in Gene Therapy

Medical Nano robots can readily treat genetic diseases by comparing the molecular structures of both DNA and proteins found in the cell to known or desired reference structures. Any irregularities can then be corrected, or desired modifications can be edited in place. In some cases, chromosomal replacement therapy is more efficient than repair. Floating inside the nucleus of a human cell, an assembler-built repair vessel performs some genetic maintenance. Stretching a supercoil of DNA between its lower pair of robot arms, the Nano machine gently pulls the unwound strand through an opening for further analysis. Upper arms, meanwhile, detach regulatory proteins from the chain and place them in an intake port. The molecular structures of both DNA and proteins are compared to information stored in the database of a larger nano computer positioned outside the nucleus and connected to the cell repair ship by a communications link. Irregularities found in either structure are corrected and the proteins reattached to the DNA chain .which re-coils into its original form. With a diameter of only 50 nanometers, the repair vessel would be smaller than most bacteria and viruses, yet capable of therapies and cures well beyond the reach of present-day physicians. With trillions of these machines coursing through a patient's blood .



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Advantages of pharmaceutical Robot:

Sr.no	Advantages	Uses
1	Accuracy	Robotic system are more Accurate and consistent than their human Counterparts.
2	Tirelessness	A Robot can perform a 96 man hour project in 10 he with more consistency and higher quality results.
3	Reliability	Robots can work 24 hrs a day,7 days a week without shopping orr turing.
4	Return on investment	There is quick tummurn -riund with the incrase in qualitytand application speed.
5	Affortable	With the advancement in technology & affortable robotics becoming available at less cost.
6	Quality	Robot have the capacity to dramatically improve prroduct & high repestability every.time.
7	Flexibility	Packaging application can vary.Robits are easily reprogrammed.
8	Speed	Robots work effciently.without wasting movement or time.

III. CONCLUSION

Medical robotics is a young and relatively unexplored field made possible by technical improvements over the past couple of decades. Currently available systems have been available for too short time to allow long-term studies. not are the benefits potentially provided by medical robots fully understood. Medical robots have only passed through a few technological generations and the technology continues to change and leap into new areas. Yet by looking at the current market and representative research systems, educated guesses can be made about the impacts of robots on near-future medicine.

In surgical robotics, there has been a trend away from Autonomous or even semiautonomous motions, and toward Synergistic manipulation and virtual fixtures.

All applications have left visible marks in many different fields. With robots, hospital pharmacies will increase their performance, increase prescription filling levels, improve counting accuracy, minimize drug Errors, increase safety, ensure adherence to patient doses, automate their supply chains, and avoid delays in Supplies and stock outages. Besides, robots can also help them minimize costs as they do not need to hire Additional staff to support the extra load at peak times. The advantages are apparent, but what this means For humans and their sustainability is a concern. If robots are able to perform better, there will be no need For humans, and large-scale unemployment could occur. The famous late Stephen Hawking said, “This may Mean the end of the human race.” It would therefore be essential to create AI to work with humans rather Than independently. AI can ensure accuracy within the parameters of the task, and humans will be able to

Have a broader reach when making decisions. Clinical decisions can be improved with AI and thus drive Further research. The important goals of our future research will be to cover more studies related to Pharmacy robots and medication dispensing technologies. We are also interested in comparing the studies With analysis and critical evaluation.

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