

Telemedicine System: The Future of Healthcare Services

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Abstract- Telemedicine is a medicinal services conveyance idea that empowers inaccessible patients particularly in country territories to be inspected by the doctors utilizing broadcast communications advancements. It is given that dominant part of populace abides in country territories in creating nations that speak to the biggest patient base of assortment of medical problems. Access to essential medicinal services, specialists, and treatment is not really reachable. Telemedicine has increased huge notoriety in creating nations where provincial populace is denied access to even fundamental social insurance. By and by telemedicine is demonstrating a great degree suitable and plausible arrangement contacting provincial populace and crossing over dissimilarity in quality and access to medicinal services amongst urban and country districts. The telemedicine showcase has seen awesome development of late fundamentally due to joining Information innovation Communication and Healthcare. This report inspects the present condition of telemedicine in creating nations. It additionally talks about telemedicine execution cases, exercises gained from the cases, and finishes up with potential researchable basic achievement factors that record for the development and unassuming accomplishments of telemedicine. These reports likewise quickly examines about the progressions in usage of telemedicine in created countries.

Index Terms- telemedicine, ICT, Tele-ICE, Tele-Education.

1. INTRODUCTION

In creating nations the country populace battles to benefit the luxuries of present day medicinal services. There is constantly lopsided number of elderly individuals, kids and grown-ups with incessant sicknesses. Data Communication Technologies (ICT) has had a huge effect on provincial populace as far as empowering access to human services through telemedicine. Assortment of telemedicine activities have been attempted to interface rustic populace with human services offices. ICT has improved telemedicine by which patients can be analyzed, explored, checked, and treated, with the patient and the specialist situated at better places. Telemedicine administrations are being utilized as a part of radiology, cardiology, ophthalmology, pathology, and tele-instruction.

Different utilizations incorporate infection reconnaissance, catastrophe and sickness administration, remote interview second sentiment, tele-guided system, homecare, restorative instruction and open mindfulness.

This paper is separated into four areas. The main area portrays the need of telemedicine. The second area talks about telemedicine innovations accessible and the average foundation. The third segment depict the financial effect of telemedicine on the network and how it is demonstrating valuable. The fourth segment depicts chances of telemedicine in creating nations. The fifth and last area contacts upon the future part of telemedicine innovation.

2. LITERATURE REVIEW

Telemedicine has been appeared to enhance time-to-conclusion, encourage look after patients in remote districts, and increment quiet fulfillment. Human services associations, systems and government associations looked with supplier deficiencies, get to aberrations and spending challenges, are receiving telemedicine to viably interface topographically remote patients with pros situated in focuses of perfection, to enable rare experts to be available to come back to work crosswise over systems, and to give remote checking of patients (Hospital Mortality, Length of Stay, and Preventable Complication Among Critically Ill Patients Before and After Tele-ICE Reengineering of Critical Care Processes, 2011). Various ongoing investigations bolster the view that telemedicine-based mediations can bring about equivalent results to conventional, in-person gatherings, while in the meantime offering the potential for cost funds and different efficiencies. The U.S. Office for Health Care Quality and Research distributed discoveries from an investigation in the *New England Journal of Medicine* that help the utilization of video conferencing innovation in the treatment of patients with hepatitis C infection contaminations. (Results of Treatment for Hepatitis C Virus Infection by Primary Healthcare Provider, 2011). The examination found that, for a few hundred hepatitis C patients in New Mexico, the rate of genuine antagonistic occasions was altogether diminished and fix rates were equivalent for patients treated by neighborhood essential care suppliers and patients seen at the geologically far off University of New Mexico hepatitis C center. The creators inferred that nearby suppliers, legitimately bolstered by means of telemedicine by authorities, had a tendency to be all

the more socially equipped concerning their particular network. In this way, by enabling the patients to remain nearby to home as opposed to going for mind, patients' adherence to treatment had a tendency to enhance and they were for the most part in more incessant contact with their providers(Diagnosis and treatment,2011)

3. NEED FOR TELEMEDICINE IN DEVELOPING CONTRIES

Telemedicine is only the eventual fate of human services yet it isn't ordinarily known and talked about despite the fact that it has been around for over 10 years now. In cutting edge and created nations social insurance office is accessible to the natives who have simple access upheld by cutting edge innovation in urban areas as it were. Be that as it may, even in rustic zones of created nations medicinal services offices are inaccessible to react to crisis. In creating nations the vast majority of the of the human services offices in rustic and remote territories don't have qualified staff, a doctor, and they are principally relying upon far off medical attendant expert or paramedical staff who are inadequate to settle on a choice with regards to basic discoveries. Subsequently in such cases a referral to a claim to fame or a subspecialty is required to get a specialist assessment. Therefore, late revelation of disease, transport time to urban medicinal services offices, and unpracticed essential human services suppliers in provincial zones is an immediate result.

4. TELEMEDICINE INFRASTRUCTURE

Telecommunications is an essential link in introducing a telemedicine application. There should be a near zero tolerance telecommunication infrastructure in place for sustenance of reliability, authenticity, and security, the risks of breakdown or even of any corruption of links. Since telemedicine demands an extensive telecommunications network security, a high efficiency level, and adequate transmission capacity, hence security and reliability of telecommunications networks is a decisive factor for introducing telemedicine applications that eventually impacts both economic and practical viability.

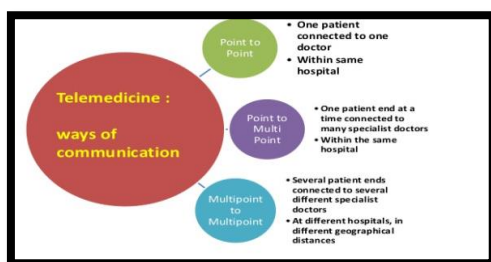


Fig1. Ways of communication

5. TELEMEDICINE TECHNOLOGIES

Telemedicine ICU interviews include ongoing, live intelligent superior quality video and sound correspondence between the authority at the local pediatric ICU and the social insurance supplier at the remote clinic. There are 3 specialized parts required for an effective meeting, to be specific, videoconferencing gear, a media communications association, and day in and day out specialized help when required. Telemedicine videoconferencing units utilized for live telemedicine can differ from low-end, programming based frameworks to higher end turnkey frameworks. The product based frameworks are utilized as a part of conjunction with a PC and a Webcam where the product utilizes the PC to decide and utilizes the Webcam for the video source, though the turnkey frameworks fuse video, sound, and the association in one framework.

6. ECONOMIC IMPACT OF TELEMEDICINE IN A RURALCOMMUNITY

Telemedicine, or the connecting of rustic occupants with urban wellbeing pros, has long held the guarantee of drastically enhancing human services in provincial networks. Research has demonstrated that the accessibility of telemedicine enables country territories to offer a bigger assortment of social insurance administrations (Rickets 2000); enhance the general view of human services quality (Nesbitt et al. 2005); and even help with enrollment and maintenance of doctors . The idea of telemedicine, be that as it may, enables it to improve wellbeing administrations to a network.

7. OPPORTUNITIES OF TELEMEDICINE IN DEVELOPING CONTRIES

Increased access to health care is on the biggest chances of telemedicine presents. It can possibly furnish underserved populace in creating nations with the methods for get to social insurance that will totally rethink and emphatically affect human services and conveyance of administrations . The nature of administration and openness of medicinal services has altogether enhanced enabling far off suppliers to assess, analyze, treat, and give follow-up care to tolerant in creating nations . The social insurance suppliers can effectively give tertiary care and empower patients to take the benefit of prior medicines and enhanced personal satisfaction for patients with ceaseless conditions. Telemedicine has assumed a noteworthy part in antagonistic circumstance where either social insurance proficient is inaccessible or not sufficiently experienced to offer fitting therapeutic help. Utilizing telemedicine remote doctor can offer required help and authority assessments regarding the matter. It is

unquestionably a feeling of consolation to the two patients and specialists. As the reports demonstrate that there has been checked diminishing in number of referrals to off-site offices and lessening needing understanding exchanges by utilizing telemedicine programs.



Fig.2 Treatment using videoconferencing

8. COMPONENTS AND METHODS OF TELEMEDICINE

Remotely coordinating was dependably a piece of teleconsultation between associates for suitable administration of patients from beginning of the most recent century after creation of the phone framework. Still specialists are extremely used to this method of telconsultation among themselves. Videoconferencing is the most fitting system to have teleconsultation however it needs costly arrangement of hardware and alongside high transmission capacity necessity, which is the most costly thing to purchase in Bangladesh.

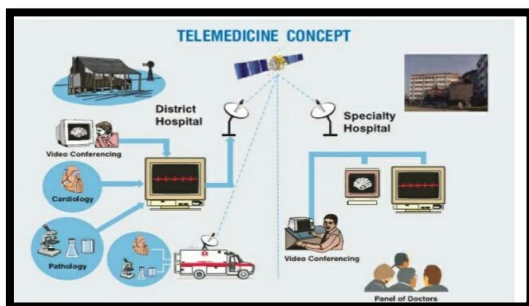


Fig 3.Simple Telemedicine System

8.1. INDIAN SPACE RESEAR ORGNIZATION

Indian Satellite System (INSAT) is produced by ISRO keeping in mind the end goal to use it towards the execution of telemedicine extends the nation over. The country telemedicine activity is actualized under GRAMSAT (Rural Satellite) program concentrating on the improvement of rustic culture. ISRO has additionally worked together with state governments to build up telemedicine arrange comprising of 382 Hospitals-306 Remote/Rural, District Hospitals/Health Centers associated with 51 super claim to fame doctor's facilities situated in significant states. Sixteen versatile Telemedicine units are a piece of this system.

9. MINISTRY OF HEALTH AND FAMILY WELFARE (MOH & WF)

Integrated Disease Surveillance Program network is being implemented by the Ministry of Health and Family Welfare (MoH & FW). The initiative links all district hospitals with state medical colleges to facilitate tele-consultation, tele-education/ training of health professionals and monitoring disease trends. Onco-NET India project is under implementation which will network 27 Regional Cancer Centers (RCCs) with 108 Peripheral Cancer Centers (PCCs) 155 hospitals to facilitate national cancer control program .

10. TELEMEDICINE INITIATIVES UNDERTAKEN BYMULTI SPECIALITY HEALTHCARE ORGNIZATIONS

Country's leading multi specialty healthcare Nation's driving multi claim to fame medicinal services associations have played a lead part in actualizing telemedicine programs by either joint effort or solo. SGPGI, Luck presently is as of now utilizing telemedicine drew nearer finished 10 years. It has built up a system by connecting 27 national and worldwide focuses with the end goal of tele-instruction and tele-social insurance programs. AIIMS, New Delhi is associated with the conditions of Jammu &Kashmir, Haryana, Orissa, North East states system and PGIMER, Chandigarh associated with the conditions of Punjab and Himachal Pradesh organize.organizations have taken a lead role in implementing telemedicine programs by either collaboration or solo. SGPGI, Luck now is already using telemedicine approached over a decade. It has established a network by linking 27 national and international points for the purpose of tele-education and tele-healthcare programs. AIIMS, New Delhi is connected with the states of Jammu &Kashmir, Haryana, Orissa, North East states network and PGIMER, Chandigarh connected with the states of Punjab and Himachal Pradesh network.

There are other leading Hospitals linked with other distant and remote location of India. Welfare (MoH & FW). The initiative links all district hospitals with state medical colleges to facilitate tele-consultation, tele-education/ training of health professionals and monitoring disease trends. Onco- NET India project is under implementation which will network 27 Regional Cancer Centers (RCCs) with 108 Peripheral Cancer Centers (PCCs) 155 hospitals to facilitate national cancer control program .

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APPLICATION

11.1. TELE-HEALTH CARE:

It is the use of information and communication technology for prevention, promotion and to

Provide health care facilities across distance. It can be divided in the following activities

-Teleconsultation and Telefollow-up

11.2. TELE- EDUCATION:

Tele-Education should be understood as the development of the process of distance education (regulated or unregulated), based on the use of information and telecommunication technologies, that make interactive, flexible and accessible learning possible for any potential recipient

11.3.DISASTER MANAGEMENT:

Telemedicine can assume an imperative part to give human services offices to the casualties of catastrophic events, for example, seismic tremor, wave, tornado, and so forth and man-made fiasco, for example, war, riots, and so on. Amid debacle, the majority of the earthbound correspondence interfaces either don't work appropriately or get harmed so a versatile and convenient telemedicine framework with satellite network and modified telemedicine programming is perfect for calamity alleviation.

11.4. TELE-HOME HEALTH CARE:

Telemedicine innovation can be connected to give home social insurance to elderly or underserved, homebound patients with ceaseless sickness. It permits home human services experts to screen patients from a focal station instead of heading out to remote zones incessantly sick or recovering patients for normal registration. Remote patient checking is more affordable, additional time reserve funds, and proficient approach. Tele-home care virtual visits may prompt enhanced home human services quality at decreased costs, more prominent patient fulfillment with mind, expanded access to medicinal services suppliers and less patients requiring exchange to higher, all the more expensive levels of care. A Computer Telephone Integrated (CTI) framework can screen indispensable elements of patients twenty four hours every day and give prompt alerts.

12. CONCLUSION

The use and role of telemedicine in critical care and ICU medicine is expected to increase. This technology allows subspecialists to extend the reach of their expertise more quickly and over longer distances. Critical care physicians will be able to provide better consultations to remote locations, resulting in higher quality of care. Referring hospitals and physicians will ideally be supported to care for less ill patients that previously were referred to urban tertiary care centers.

REFERENCE

- [1] Ackerman, E. (2012, July 24). I Robot and InTouch Health Announce RP-VITA Telemedicine Robot. Retrieved October 07, 2013, from IEEE Spectrum: <http://spectrum.ieee.org/automaton/robotics/medical-robots/irobotand->

- [2] Baatar, T., Suldsuren, N., Bayanbileg, S., & Seded, K. (2012). Telemedicine Support of Maternal and Newborn Health to Remote Provinces of Mongolia. In *Studies in Health Technology and Informatic* (Vol. 182: *Global Telehealth 2012*, pp. 27-35). <http://ebooks.iospress.nl/publication/22108>.