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TELEMEDICINE: PART OF VIRTUAL MEDICAL TOURISM

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ABSTRACT

Telemedicine is the use of telecommunication and information technologies in order to provide clinical health care at a distance. It helps eliminate distance barriers and can improve access to medical services that would often not be consistently available in distant rural communities. Telemedicine is the remote provision of health care services enabled by technology. A continuum of successful telemedicine applications have been demonstrated over the last twenty years, ranging from the transmission of digital photographs and patient histories for diagnostic consultation, to remote monitoring of physiologic data for chronic disease management, to interactive patient physical examination using medical video endoscopes and ultrasound over high-definition videoconferencing links. The common tie among these varied applications is that technology is used to improve access to health care services independent of geography.Telemedicine can improve quality, efficiency and customer service in medical tourism applications by better coordination of care between providers in patients' home and foreign countries, enhanced preoperative and postoperative care, and optimizing patient and family member travel. This article describes the basic principles and applications of telemedicine and explores the potential roles and challenges of telemedicine in medical tourism.

KEYWORDS :*Telemedicine , Virtual Medical Tourism , telecommunication and information technologies .*

INTRODUCTION :

Telemedicine is the use of telecommunication and information technologies in order to provide clinical healthcare at a distance. It helps to eliminate distance barriers and can improve access to medical services that would often not be consistently available is rural area. It is also used to save lives in critical care and emergency situation.One of the significant potential benefits of telemedicine in medical tourism is in improving the process and quality of pre- and post-operative care. There are several preoperative telemedicine applications. Baseline data can be collected remotely, preoperative physical examinations performed and patient education given. Anesthesiologists can perform tele-consultations, including remote physical assessment of the cardiovascular and

respiratory systems, including the airway. Postoperative care can also be provided via telemedicine after patients return home with virtual follow-up visits. Wound healing also can be evaluated remotely. Telemedicine would allow surgeons to coordinate follow-up care with patients' local primary care providers and specialists. Developments in remote monitoring technology make it possible for postoperative home monitoring, potentially mitigating the risk of hospitalization or reducing the length of hospital stays in the immediate postsurgical period.

Finally, telemedicine offers the potential to improve the level of customer service provided to medical tourists. For example, preoperative videoconferencing would allow patients, family members, surgeons and other key members of surgical staff to virtually meet face-to-face. Similarly, concerned family members who did not accompany the patient could stay in touch with the patient or traveling family members and receive briefings or updates from the surgeon or other key staff. This level of connectedness could also be used to improve continuity of care, by keeping the patient's care providers in his or her home country involved throughout the preoperative period.

TELEMEDICINE

The word Telemedicine is a combination of the Greek word 'T ?e' (tele) meaning 'distance' and the Latin word 'mederi' meaning 'to heal' and therefore literally means, 'distance healing'. It is not one specific technology but a means of providing health services from a distance using telecommunications and computer science. It spans every level of healthcare from the first responder or emergency medical systems to tertiary medical specialty consultations to performing invasive and / or surgical procedures delivering home care.

The technology makes it possible to have the 'right' information (clinical information) available to the 'right' people (patients, care providers, family and friends) at the 'right' time (on-demand, during and after the treatment process).In short, telemedicine is a high-tech solution to the universal problem of access to healthcare irrespective of physical location of the various stakeholders of the clinical care process.

TELEMEDICINE DEFINED

Telemedicine is the use of medical information exchanged from one site to another via electronic communications to improve a patient's clinical health status. Telemedicine includes a growing variety of applications and services using two-way video, email, smart phones, wireless tools and other forms of telecommunications technology.

According to World Health Organisation, telemedicine is defined as, "The delivery of healthcare services, where distance is a critical factor, by all healthcare professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for continuing education of healthcare providers, all in the interests of advancing the health of individuals and their communities".

MEDICAL TOURISM

Medical tourism is a term applied to the process where people from all around the world travel to foreign countries to obtain medical, dental and surgical care. At the same time, it is a tour, a vacation and an experience of visiting them.Medical tourism companies organizepatient's treatment, travel arrangements and tours at a fraction of cost incurred in the patient's own country. This is a great value addition to all concerned. The patient gets relief quickly without compromising on the quality and quantity of care. The healthcare industry earns valuable revenues. The healthcare industry gets

invaluable business. The countries where medical tourism is being actively promoted include Greece, South Africa, Jordan, India, Malaysia, Philippines and Singapore. Medical tourism definitely adds itself to the top-line of the various healthcare institutions. Even though the revenue model is volume-dependent, the capacity and quality of care is enough to ensure healthy profit margins at reduced rates.

MEDICAL TOURISM PROCESS

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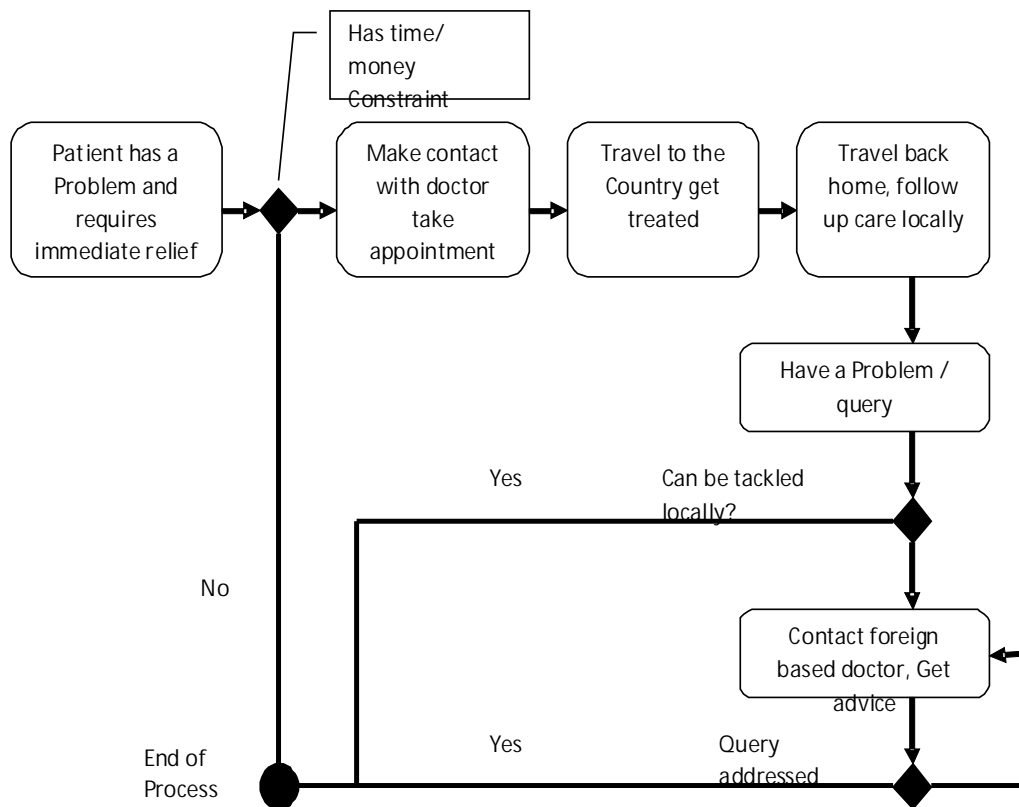
In Medical Tourism, the basic business process is as follows:

1) A patient residing in an area where he is unable to get relief from his problems due to high treatment costs, long delays in getting the treatment or both, looks for ways and means to get relief as soon as possible at equal or lower cost

2) Patient decides to travel to India where the cost of comparable quality and quantity treatment is same or less and is readily available

3) A competent care provider at an institution of patient's choice located in
India reviews patient's case records and gives an appointment.

4) The patient then travels to India where the institution is located and receives the treatment

5) Pre- or post-treatment, patient conducts some sightseeing according to his choice (and budget), and then at the termination of his visit travels back to his country with all his treatment records and post-treatment advice to his primary care physician

6) For follow-ups required at his place of residence, patient is provided with instructions regarding how these actions need to be undertaken

The most important decision point being both the quality and quantity of care ensure patient safety while providing the best of care available anywhere.

TELEMEDICINE BUSINESS PROCESS
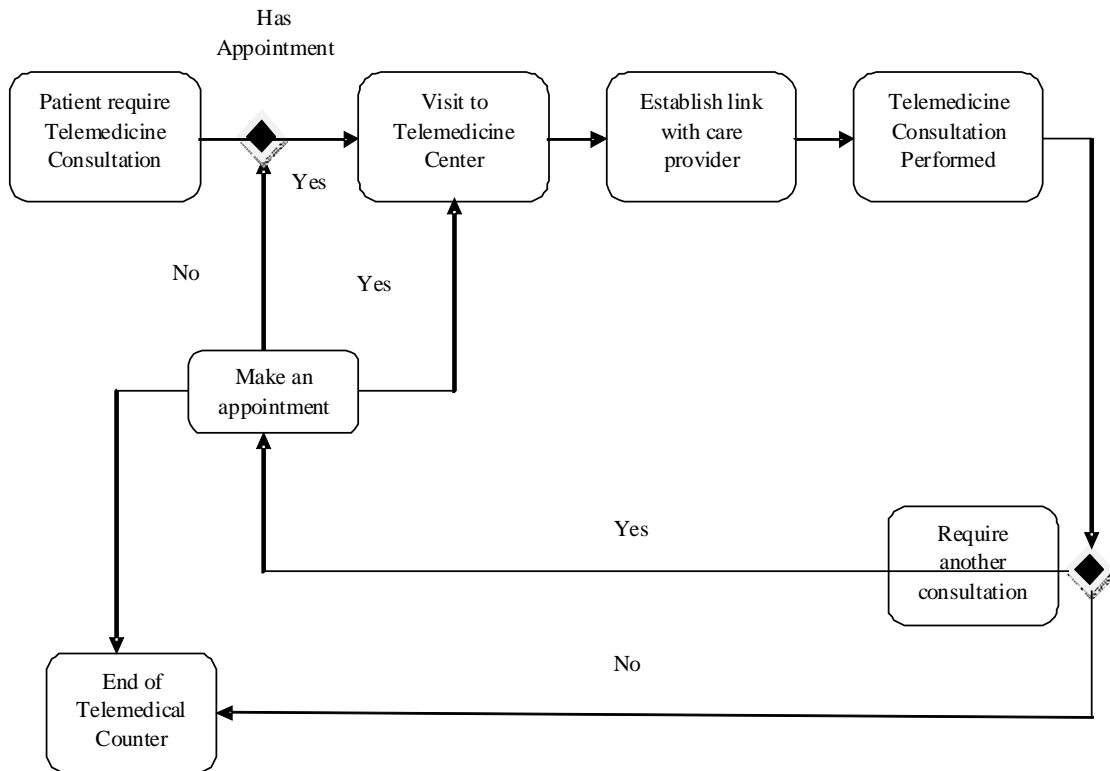
In Telemedicine, basic business process is as follows

1)If patient has problem and require relief, but medical facilities are not available, in that case patient visits telemedicine center by taking prior appointment

2)Link will be established with care provider

3)Telemedicine consultation will be given by expert

4)If the patient gets relief then there is no need of consultation but if patent will not get relief again appointment will be taken by patient for further telemedical consultation.

APPLICATION OF TELEMEDICINE
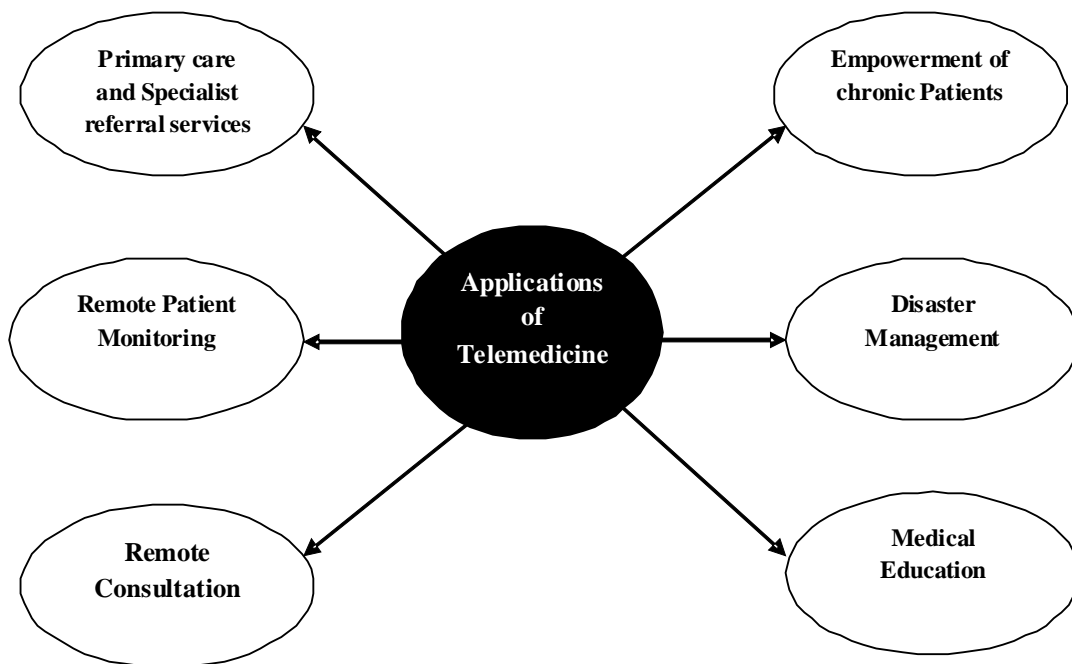
Primary care and Specialist referral Services:

Primary care and specialist referral services may involve a primary care or allied health professional providing a consultation with a patient or a specialist assisting the primary care physician in rendering a diagnosis. This may involve the use of live interactive video or the use of store and forward transmission of diagnostic images, vital signs and/or video clips along with patient data for later review.

Remote Patient Monitoring,:

Remote patient monitoring, including home Telehealth, uses devices to remotely collect and send data to a home health agency or a remote diagnostic testing facility (RDTF) for interpretation. Such applications might include a specific vital sign, such as blood glucose or Heart ECG or a variety of indicators for homebound patients. Such services can be used to supplement the use of visiting nurses.

Consumer Medical and Health Information:

Consumer medical and health information includes the use of the Internet and wireless devices for consumers to obtain specialized health information and on-line discussion groups to provide peer-to-peer support.

Telemedicine Empowers Chronic Patents who are less Mobile :

The telemedicine intervention in chronic disease management promises to involve patients in their own care, provides continuous monitoring by their healthcare providers, identifies early symptoms, and responds promptly to exacerbations in their illnesses.

Telemedicine Disaster Management::

Telemedicine can play an important role to provide healthcare facilities to the victims of natural disasters such as earthquake, tsunami, tornado, etc and man-made disaster such as war, riots, etc. During disaster, most of the terrestrial communication links either do not work properly or get damaged so a mobile and portable telemedicine system with satellite connectivity and customized telemedicine software is ideal for disaster relief.

Telemedicine Empowers Medical Education:

Medical education provides continuing medical education credits for health professionals and special medical education seminars for targeted groups in remote locations.

TELEMEDICINE: FACTS AND FIGURES
Global Telemedicine Market

The Global remote healthcare delivery market is a $12Bn market growing at 18.6% and dominated by the services segment. The Global Telemedicine market grew from $9.8 billion in 2010 to $11.6 billion in 2011 and will almost triple to $27.3 billion in 2016, growing at a CAGR of 18.6%

The telemedicine market is segmented into tele hospital and tele home markets. The tele hospital market was worth $6.9 billion and tele home market was valued at nearly $2.9 billion, however the tele home segment is growing faster than the tele hospital segment at a projected CAGR of 22.5% vs. 16.8% .The tele medicine market is also segmented into technology & service segments. The technology portion is expected to grow from $3.9 billion in 2010 to reach $11.3 billion in 2016, with a CAGR of 19.8% and service market is expected to grow from $5.9 billion in 2010 to $16.0 billion in 2016 at a CAGR of 18.1%

GLOBAL TELEMEDICINE DELIVERY MARKET

	2010	2016
■ Technology	5.9	11.3
■ Services	3.9	16
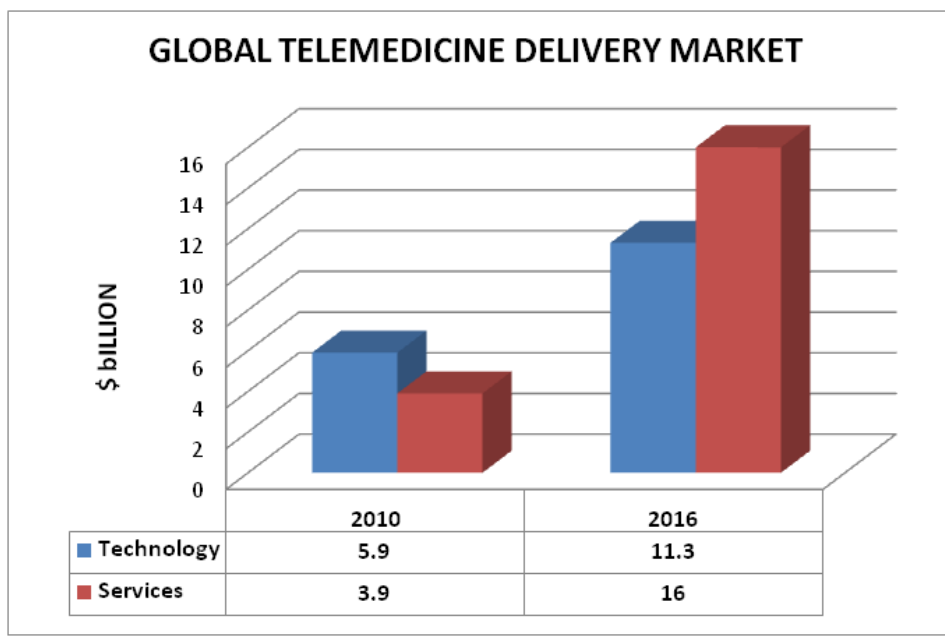
INDIAN TELEMEDICINE MARKET

Indian remote healthcare delivery market is expected to grow at a CAGR of 20%. Indian private sector tele medicine market was estimated to be $7.5 million in 2011 and is expected to grow at a CAGR of around 20% over the next 5 years to $18.9 million in 2016. However, including government, PPP and

other initiatives, the market is expected to grow to $500Mn by 2016. The market is witnessing increased acceptability; however estimates vary because of the nascent stage of the industry

TELEMEDICINE IN INDIA

- 11th Five-Year plan allocates priority for providing accessible health care to rural population using existing fibre optic and satellite infrastructure
- With the help of IT, satellite and fibre optic network, Telemedicine provides specialized healthcare to remote corners of country
- Telemedicine as a practice has been adopted by both – private and public sector healthcare providers
- Public healthcare network using Telemedicine consists of 42 super-specialty hospitals with 8 mobile vans and 200 rural and remote hospitals
- 300,000 people have benefitted from the Telemedicine network

KEY GROWTH DRIVERS OF TELEMEDICINE IN INDIA

- Low cost and wide reach over satellite or fiber optic bandwidth
- Lack of disease management framework
- Lack of healthcare facilities in far-off regions
- Reduced technology cost and availability of qualified technical personnel
- Shortage of qualified medical professionals
- Increased governmental focus on healthcare for all
- Urban-Rural divides causing disparity in medical facilities
- Dedicated satellite for health communications from ISRO
- Growth of Information and Communications Technology (ICT) as a sector
- National Telemedicine Grid to connect practitioners and institutions
- PPP model for development of healthcare infrastructure

KEY PLAYERS IN TELEMEDICINE INDUSTRY IN INDIA

- Ministry of Health, Government of India
- Department of Information Technology,
- State Government, which manages hospitals in district and remote places
- Satellite bandwidth provider – ISRO
- Medical Education provider – AIIMS, SGPGI, Medical Colleges across India
- Healthcare providers - Apollo Hospitals, AIIMS, Asian Heart Foundation, NarayanaHrudalya, Amrita Institute of Medical Sciences, District hospitals
- Telemedicine software provider – C-DAC, Televital, Apollo Telemedicine Networking Foundation
- Medical equipment providers – Wipro GE Healthcare, Siemens, Philips
- Telecommunications equipment providers – VTEL, Cisco, Ericson
- Videoconferencing equipment provider – Polycom, SONY

TYPES OF TELEMEDICINE

There are three main types of telemedicine, which include store-and-forward, remote monitoring and real-time interactive services. Each of these has a beneficial role to play in overall health care and, when utilized properly, can offer tangible benefits for both healthcare workers and patients.

Store-and-Forward

Store-and-forward telemedicine surpasses the need for the medical practitioner to meet in person with a patient. Instead, data such as medical images or biosignals can be sent to the specialist as needed when it has been acquired from the patient. This practice is common in the medical fields of dermatology, radiology and pathology.

With proper structure and care, this technique can save time and allow medical practitioners to serve the public with their services more fully. However, it relies on a history report and documented information or images, rather than a physical examination, which has the potential to cause complications such as misdiagnosis.

Remote Monitoring

Also known as self-monitoring or self-testing, remote monitoring uses a range of technological devices to monitor health and clinical signs of a patient remotely. This is extensively used in the management of chronic diseases such as cardiovascular disease, diabetes mellitus and asthma.

Benefits of remote monitoring include cost effectiveness, more frequent monitoring and greater patient satisfaction. There is some risk that tests conducted by the patients themselves may be inaccurate, but the outcomes are generally thought to be similar to professional-patient tests.

Real-Time Interactive Services

Interactive services can provide immediate advice to patients who require medical attention. There are several different mediums utilized for this purpose, including phone, online and home visits. A medical history and consultation about presenting symptoms can be undertaken, followed by assessment similar to those usually conducted in face-to-face appointments.

•Teleneuropsychology is an example of this type of telemedicine that includes neuropsychological consultation and assessment over the phone with patients that have, or are suspected to have, a cognitive disorder. Standard evaluation techniques are implemented to assess the patient via video technology.

•Telenursing refers to the utilization of communicative technology to provide remote nursing services. Consultations can be made over the phone to reach a diagnosis and monitor health conditions and symptoms. This is growing in favor due to the low cost and high accessibility of the services to patients, particularly for those in rural regions. It also has the potential to lessen the burden of patients in hospitals because it is possible to address minor ailments earlier and patients can receive advice about whether hospital admission is required.

•Telepharmacy allows pharmaceutical advice to patients when direct contact with a pharmacist is not possible. This allows medications to be monitored and patients can be offered advice over the phone. Depending on regulations, refill authorization may be given to allow patients to receive regularly medications when required.

•Telerehabilitation utilizes technology to communicate and perform clinical assessment and therapy for rehabilitation patients. This usually has a strong visual element with video conferences and webcams commonly used to assist in communicating symptoms and clinical progress.

These services are a great step forward in improving accessibility of healthcare to all patients, particularly those living in areas with limited local health professionals. Additionally, they offer a significant benefit of reduced cost in comparison to traditional in-person appointments.

ADVANTAGES OF TELEMEDICINE

+ Many patients feel uncomfortable to go to hospital or doctor-chamber. This system creates communication among patients & healthcare professionals maintaining convenience & commitment. Moreover, through Telemedicine medical information and images are kept confidential and safely transferred from one place to another. So, people can believe this system and feel comfort to seek help from it.

+ It saves lives in the emergency situations, while there is no time to take the patient at a hospital.

+ In many rural communities or remote places or post-disaster situations, consistent healthcare is unavailable. Telemedicine can be applied in such places or situations to provide emergency healthcare.

+ This system is useful for the patients residing in inaccessible areas or isolated regions. Patients can receive clinical healthcare from their home without arduous travel to the hospital.

+ Modern innovations of information technology such as, mobile collaboration has enabled easy information sharing and discussion about critical medical cases among healthcare professionals from multiple locations.

+ Telemedicine has facilitated patient monitoring through computer or tablet or phone technology that has reduced outpatient visits. Now doctors can verify prescription or supervise drug oversight. Furthermore, the home-bound patients can seek medical-help without moving to clinic through ambulance. Thus, cost of health care has been reduced.

+ This system also facilitates health education, as the primary level healthcare professionals can observe the working procedure of healthcare-experts in their respective fields and the experts can supervise the works of the novice.

+ Telemedicine eliminates the possibility of transmitting infectious diseases between patients and healthcare professionals.

DISADVANTAGES OF TELEMEDICINE

+ The overall cost of telecommunication system, especially data management apparatus and practical training of medical professionals is great.

+ Virtual clinical treatment decreases human interaction among the healthcare professionals and patients that increases the risk of error in clinical services, if the service is delivered by inexperienced professional. Moreover, confidential medical information can be leaked through faulty electronic system.

+ Telemedicine might take longer time for the difficulties in connecting virtual communication due to low internet speed or server problem. Moreover, this system cannot provide immediate treatment, such as, antibiotics.

+ Low quality of health informatics records, like, X-ray or other images, clinical progress reports, etc. run the risk of faulty clinical treatment.

+ Telemedicine system requires tough legal regulation to prevent unauthorized and illegal service providers in this sector.

SWOT ANALYSIS OF TELEMEDICINE MARKET IN INDIA

STRENGTHS

- Growing enthusiasm for research & development by academic institutions, government , individual researchers, technology firms
- National level organizations & government funded companies established to develop & promote telemedicine
- Increased Doctor acceptance for remote healthcare delivery if clinical effectiveness proven
- Growing awareness of the potential of remote healthcare delivery as an alternate to bridge the skewed doctor population ratio between urban and rural

WEAKNESS

- Lack of national level standardizations in telemedicine in terms of technical standards, business models, payments, etc.
- Absence of a legal framework governing remote healthcare delivery, making way for potential legal liabilities
- Unevenly distributed telecom networks that may become an obstacle for telemedicine development
- Infrastructure challenges in remote areas
- Lack of commitment since most often remote healthcare delivery is setup as an add-on practice and not a dedicated cell

OPPORTUNITIES

- Vast and diverse geography with dominant rural population
- Disparity in healthcare infrastructure
- Low cost, locally developed technical solutions & ICT expertise
- Fast adoption of Mobile technology
- Policy on adoption of ICT in service delivery in 12th Plan
- Budget Allocation under National Rural Health Mission
- National Optic Fiber Network being laid

THREATS

- Human resource constraints in terms of computer literacy amongst medical practitioners & rural paramedics / ground staff
- Absence of legal framework might detract comprehensive usage of remote healthcare delivery
- Large scale private sector implementation might not happen if clear revenue streams and physician compensation models are not designed

TELEMEDICINE MODEL

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                    ┌──────────────┐        • Patient under Treatment
                    │   NODEL      │        • Physician treating the Patient
                    │  HOSPITAL    │        • A remote telemedicine Console
                    └──────────────┘          having audio visual and data
                                               conferencing facilities

                                        ┌──────────────────────┐
                                        │  ISDN /LEASED        │
                                        │  LINE/POTS/VSAT      │
                                        └──────────────────────┘

  • An expert/specialized doctor
  • A    central telemedicine server     ┌──────────────┐
    having audio visual and data         │  REFERRAL    │
    conferencing facility                │  HOSPITAL    │
                                         └──────────────┘
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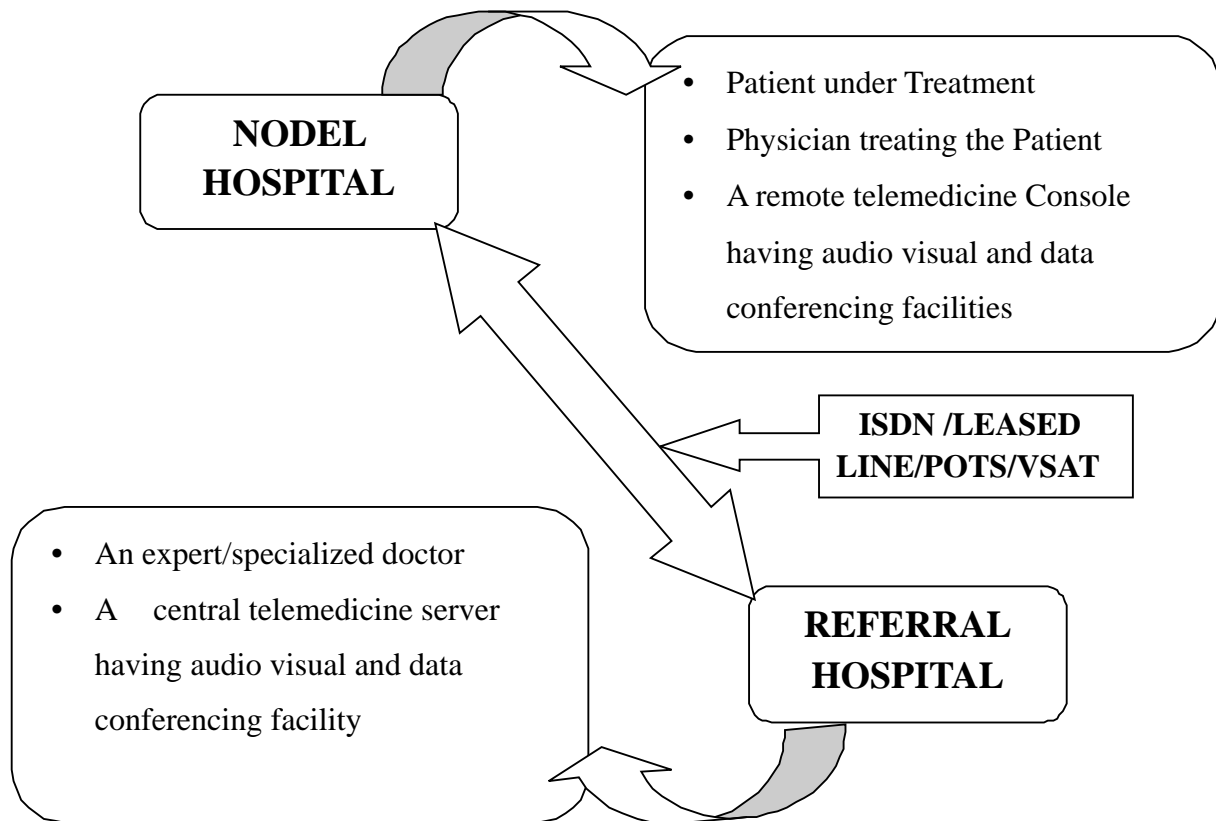
CONCLUSION

Telemedicine bridges gap between patients and available healthcare infrastructure Use of Telemedicine technology have expanded over the last five years and offer the potential to make a major impact on the improving quality, efficiency and customer service in medical tourism. Advancement in technology enables the remote provision of health care services at locations most convenient for the patient and minimizes travel for patients and family members. Telemedicine can lead to improvements quality and efficiency of pre- and postoperative care as well as continuity of care. Although there are several legal, regulatory, technical, and organizational barriers to Telemedicine, they are surmountable. Telemedicine will play a significant role in the continued expansion and improvement of medical tourism.

REFERENCES

1.Introduction to the practice of telemedicine by John Craig and Victor Patterson Published in "Journal of Telemedicine and Telecare" Volume 11 Number 1 2005 Page No. 4-9
2.Telemedicine: A New Horizon in Public Health in India ByAparajitaDasgupta, Soumya Deb Published in "Indian Journal of Community Medicine" Vol. 33, No. 1, January 2008
3.The Role of Telehealth in Medical Tourism Published in Medical Tourism Magazine , August 4, 2009
4.Current Scenario and the Future by SarojKanta Mishra and IndraPratap Singh Published in Telemedicine and E-Health July/August 2009
5.Emerging Trends of Telemedicine in India by G. Brindha Published in Indian Journal of Science and

Technology Vol 6 (5S), May 2013, Print ISSN: 0974-6846, Online ISSN: 0974-5645 Page No.

6.Karnataka State Telemedicine Project: Utilization Pattern, Current, and Future Challenges by BharathHolla, BijuViswanath, ShanthaveerannaNeelaveni, T. Harish, Channaveerachari Naveen Kumar, and Suresh Bada Math Published in Indian J Psychol Med. 2013 Jul-Sep; 35(3): 278–283.

7.Market Analysis India Perspective by Dr. Sanjay Sharma Published in Remote Healthcare

8.Solutions and Services

9.Telemedicine in India: Current Opportunities and barriers by Prof.Rekha Jain

10.A Brief Report on Healthcare, Telemedicine, & Medical Tourism in India by ASA & Associates LLP 2015 Page No. 1-19

11.A Brief History of Telemedicine by Peter Mangiola RN 2015

12.Telemedicine in India : Initiatives and Perspectives-B.S.Bedi

13.A Seminar presentation on Telemedicine by Pawan Saini

14.Types of Telemedicine by Yolanda Smith published in News Medical

15.www.google.com

16.www.telemedicineindia.com

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