



Contents lists available at BioMedSciDirect Publications

## International Journal of Biological & Medical Research

Journal homepage: [www.biomedscidirect.com](http://www.biomedscidirect.com)



### Short Report

## Could India become the digital pathology hub of the future? A consideration of the prospects of telepathology outsourcing.

Anil Malleshi Betigeri <sup>a\*</sup>, Parameswaran Aparna <sup>b</sup>, Palanisamy Pasupathi <sup>b</sup>

<sup>a\*</sup>Department of Pathology & <sup>b</sup>Department of Clinical Biochemistry, K.G. Hospital and Post Graduate Medical Institute, Coimbatore-641 018, Tamil Nadu, India

#### ARTICLE INFO

##### Keywords:

Telepathology  
Digital pathology  
Medical outsourcing  
PPR- Physician-patient relationship  
Medico legal.

#### ABSTRACT

Low cost, time zone differences and telecommunication advances have contributed immensely to the progress of telemedicine there by changing the fundamental physicality of medicine. While much progress has been accomplished in the developed world, telepathology (TP) in India stagnates in its primitive stages owing to multiple factors. There is a general lack of agreement on preferred technology and standards of acceptable skill among the pathology community. There is a need for governmental institutions & other professional organizations to take the initiative in implementing residential programs towards creating the next generation of pathologists capable of interpreting the newly emerging "virtual" world. Most pathologists are not averse to applying modern technology, but a comprehensive charter with well-defined legal boundaries is necessary to serve as a road map for the future. Both the cost & quality of care needs to be gauged against a backdrop of privacy, billing, licensing, and liability concerns.

© Copyright 2010 BioMedSciDirect Publications IJBMR -ISSN: 0976:6685. All rights reserved.

### 1. Introduction

Healthcare is now going digital, permitting the outsourcing of a range of medical services including clinical and diagnostic services. However, a complex regulatory & legal environment governs the implementation of healthcare. The stimulus act (American Recovery and Reinvestment Act of 2009) contains a Title IV entitled (The Health Information Technology for Economic and Clinical Health Act) HITECH Act [1]. It is anticipated that more healthcare reforms and digitization efforts will follow both in the general budget and in specific healthcare bills in the near future. A 2004 federal report had estimated a \$380 million telemedicine market with projected annual growth rate of 15-20% & a particularly robust growth in the fields of radiology, dermatology, mental health consultation, and home care [2]. Beyond the well-acknowledged foreign market for teleimaging, outsourcing of

telepathology is being increasingly reported. Recent commentaries suggest that India alone has already captured 2% of the U.S. health care market [3].

It was at the 50th Annual Conference of the Indian Association of Pathologists & Microbiologist in Mumbai in 2001 that most Indian pathologists were formally introduced to telepathology [4]. The experience of Desai et al [5], in using static telepathology consultation between a tertiary referral cancer center & a rural cancer hospital in Barshi, was an eye opener. Since then, the use of "telepathology quizzes" with images of interesting cases hosted at [www.telepathology.org.in](http://www.telepathology.org.in) & [www.pathoindia.com](http://www.pathoindia.com) have caught the imagination of many pathologists. These sites also attempted to provide free consultancy service by expert pathologists. Preliminary reports are published based on experience of tele-education & tele-consultation sessions among medical colleges in India [6,7].

### 2. Pathology Practice in India

The reasons for relative delay in acceptance of telepathology in India are multifactorial. There has been some resistance from senior histopathologists possibly because of a negative perception

\* Corresponding Author : Dr. Anil Malleshi Betigeri M.D.,  
Head-Department of Pathology  
Institute of Laboratory Medicine, K.G. Hospital and Post Graduate Medical Institute  
Coimbatore-641 018, Tamil Nadu, India  
Tel: +91 422 2201201, Fax: +91 422 2211212  
E-mail: [pathneel@gmail.com](mailto:pathneel@gmail.com)

© Copyright 2010 BioMedSciDirect Publications. All rights reserved.

regarding the practical applicability of new technology as well as an innate reluctance to abandoning time tested techniques. Reassurance of potential users is necessary because these perceived problems are human, rather than technological [4].

Till now, there have not been any concerted efforts to cultivate a new crop of pathology residents in India, modernized like in the west. The government & other professional organizations must take note of the changing global trend. We are past the tipping point in the transition from light microscopy to virtual microscopy in medical student education. Perseverance, cooperation between the different agencies and the willingness to promote telepathology must be the order of the day [8]. Also, the difficulties faced by the practicing pathologist in India are manifold [4].

Firstly, there are professional issues like i) lack of uniform training & guidelines for undergraduates as well as post graduates ii) lack of adequately trained staff, requisite facilities & sub-specialists for organ pathology iii) many pathologists work in isolation with little opportunity for consultation or peer review iv) there is no compulsion to undergo continuous medical education. Secondly, there are personal concerns, such as i) Low professional status ii) Lack of support from hospital management & clinical colleagues iii) Inadequate salaries, not commensurate with nature of the job iv) No compulsion for laboratory accreditation at many places resulting in poor lab techniques & practices.

### 3. Potential benefits of Telepathology in India

Each geographical region has its own definition for telepathology. In general, it is electronic, multimedia communication between pathologists for the purpose of primary diagnosis or second opinion. It may also be extended to include similar diagnostic communication between other physicians (non-pathologists) and lab staff by qualified laboratory personnel- trained technicians, technologists, or a pathologist's assistant- and a remote pathologist and when laboratory personnel are under the supervision of a pathologist [9].

Education might be considered the first so-called killer application of telepathology. This will be of particular value to medical college faculty members at the "have not" medical colleges in India. It is relevant therefore that the more resourceful institutions be persuaded to take up the initiative in promoting technology adaptation & diffusion among the pathology community [10]. Telepathology can also be effective in many other ways (a) It allows for consultation as well as interactive case discussion. (b) Implementation of uniform protocols including terminologies & reporting format will help in standardization of reports. (c) Creating a pool of teaching material for mutual use. (d) It will promote the need for a policy on audits for internal & external quality control program. (e) It will create a positive environment for active participation of the local pathologist in training activities.

### 4. Prospects of telepathology outsourcing

Telepathology outsourcing from developed nations may come as boon to developing nations like India. It does however increase the responsibilities and the role of local pathologist who is expected to achieve the standards to meet the expectations of the developed world. It is very important to understand the technology and also the legalities involved. Traditionally, the pathologist is viewed as having acted in good faith and in the interest of the patient. Nonetheless, inconsistencies have been reported in opinions offered by different pathologists on the same

histopathological material as well as in diagnoses by an individual pathologist reading the same slides at different times [11]. Evidently, pathologists are not infallible and capable of making mistakes. It may also serve as a helpful reminder that there are also many disparities in the availability, level, and quality of health care services within the developed world as well [8]. The best way to detect and minimize these errors would be an audit process. Even though currently most audits are institution based and suffer from bias, this can be easily remedied with inclusion of the third party to make it more transparent.

A relative reason for the failure of telepathology consultation is not sub-optimal images; but inability to suitably adapt to the demands of modern technology [4]. At times there is a clear lack of understanding and rapport between the sending pathologist & the consultant pathologist resulting in disagreement over the final diagnosis. Also, some academic pathologists are prone to obsess over the risks of using new technologies and hesitate to offer a diagnosis based on images sent by a third party. Pathologists have failed to determine a fine liability and acceptable error [12,13]. But what is required, is simply judicious use of this technology and awareness of the possible pitfalls.

Implementing uniform standardized protocols for reporting and strict quality control measures will improve the standards of reporting and will certainly enhance the prospects of telepathology outsourcing. Heads of pathology residency programs must make sincere efforts to be role models in their departments (with respect to expertise, quality of reports, professionalism, and so on) so that lifelong professional skills, habits, and attitudes become ingrained, during the "minting" of the future practitioners of pathology [10]. The government can also make laboratory accreditation compulsory leading to better lab techniques & practices.

### 5. Medico-Legal aspects

In order to practice in any country, a pathologist is required to obtain a license there. Even for those countries that do not address telepathology, it is generally assumed that any act of diagnosis or recommendation of treatment is the practice of medicine & one is bounded to law of country where patient is located. Information privacy remains the greatest source of concern about medical outsourcing. A 2006 report disclosed that 40% of federal health insurance contractors & state health agencies, both engaged primarily in domestic outsourcing, had reported recent breaches in personal health information privacy [2].

According to Centers for Medicare & Medicaid Services (CMS), if a U.S. hospital uses a U.S. credentialed radiologist operating in India to provide final reading of radiograph, it can not properly seek reimbursement (from CMS at least). However, if same hospital uses a radiologist in India to provide preliminary reading that are then reviewed for a final reading by a U.S.-based and U.S.-licensed radiologist, the final reading is probably reimbursable [8]. A similar principle can be utilized for outsourcing telepathology. It seems that the more independent judgment a physician makes in accepting or rejecting advice from consultant pathologist, the less likely the consultant will form a (PPR) physician-patient relationship [11]. As a general rule in medical malpractice, a physician does not owe a duty to the patient unless a PPR exists. But courts have used the following types of guidelines for determining if such a relationship does exist.

- ♦ If third party has contracted with the physician on the patient's behalf, PRP may exist.
- ♦ If the relationship was contracted for or with the express or implied consent of the patient and are done for the patient or for the patient's benefit. Then a PPR exists.
- ♦ A PPR exists when health care services are rendered on behalf of the patient and are done for the patient's benefits.

In the same line of reasoning, a pathologist is held to a PPR even when the patient is not aware of the pathologist existence. In defining guidelines for second opinion telepathology, pathologist should borrow, whenever possible, from the workflows and responsibilities set up in the courier-based system [11]. A pathologist may be liable for the improper use & lack of training to use equipment properly. Moreover, as technology is bound to fail, distortion or deletion of information can occur. When the information is distorted without the knowledge of the pathologist, the equipment manufacturer may be held liable for faulty equipment. In attempt to avoid liability, pathologists & referring physicians some times enter into contract that expressly states that pathologist is serving as a consultant for then physician (doctor's doctor) and does not have a relationship with the patient [8].

## 6. Conclusion

Telepathology is an evolving area of telemedicine and telepathology outsourcing from developed countries will be extremely beneficial. The possible advantages of telepathology and telepathology outsourcing cannot be ignored. There is no doubt regarding the existence of potentially skilled pathologists in India and the only requirement is standardization, quality auditing & formulating a legal road map for the pathologist. The government, well resourced institutions & professional organizations must also play an active role in creating a pool of skilled professionals to read the future - "virtual world". We must wake up to the exciting possibilities and not let this valuable opportunity slip by.

## 6. References

- [1] Devid Blumenthal. Stimulating the adoption of health information technology. *N. Engl J Med.* 2009; 15:1477-1479.
- [2] Sanjiv NS, Robert MW. Perspectives on medical outsourcing and Telemedicine- Rough edges in a Flat world? *N Engl J Med.* 2008; 358:1622-1627.
- [3] McLean TR, Richard EP. Teleradiology: a case study of the economic and legal considerations in international trade in telemedicine. *Health Aff (Millwood)* 2006; 25:1378-1385.
- [4] Baruah MK. The Practice of Telepathology in India. *J Postgrad Med.* 2005; 4:316-318.
- [5] Desai S, Patil R, Chenoy R, Kothari A, Ghosh TK, Chavan M, Mohan A, Nene BM, Dinshaw KA. Experience with telepathology at a tertiary Cancer Center & a rural cancer Hospital. *Natl Med J India.* 2004; 17:17-19.
- [6] Pradeep PV, Mishra SK, Vaidyanathan S, Nair CG, Ramalingam K, Basnet R. Telementoring in endocrine surgery: preliminary Indian experience. *Telemed J E Health.* 2006; 12: 73-77.
- [7] Pradeep PV, Mishra A, Kapoor L, Basnet R, Agarwal G, Agarwal A, Verma AK, Mishra SK. Applications of tele-health technology in endocrine surgery: Indian experience. In: *Proceedings of the Telemedicine 2007 Conference, 31 May-1 June 2007, Montreal, Canada.*
- [8] Weinstein RS, Graham AR, Richter LC, Barker GP, Krupinski EA, Lopez AM, Erps KA, Bhattacharyya AK, Yagi Y, Gilbertson JR. Overview of telepathology, virtual microscopy, and whole slide imaging: prospects for future. *Hum Pathol.* 2009; 40:1057-1069.
- [9] Beng BO, LaiMeng L. Medico-legal aspects of histopathology practice. *Malaysian J Pathol.* 2001; 2:1-7.
- [10] Dee FR. Virtual microscopy in pathology education. *Hum Pathol.* 2009; 40:1112-1121.
- [11] Stanley TL, Kaplan KJ. Medicolegal aspects of telepathology. *Hum Pathol.* 2009; 40: 1137-1142.
- [12] Lesna M. Assessing diagnostic errors: when is suspension of a pathologist justified? *J Clin Pathol.* 1998; 51:649-651.
- [13] Ramsay AD. Errors in histopathology reporting: detection and avoidance. *Histopathology.* 1999; 34:481-490.