



## Telepathology – A New Diagnostic Tool in Pathology

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### Introduction

Telepathology like its counterpart, telemedicine and many other developments in science have their origin from science fiction. It was first of all conceptualized in 1924 in the magazine titled 'Radio News'. Forty years later, the concept of using video microscopy to provide diagnostic services to remote locations was first described in USA in 1968. In the early eighties the first working telepathology system was demonstrated and subsequently in 1992, the first European symposium on telepathology was held in Heidelberg, Germany. Since 1994, due to the fast growing information technology, all the necessary hardware to produce a telepathology system has been available in the international market and in fact telepathology is now in use in many of the institutions all over the world (1).

In its simplest form, the telepathology can be defined as interpretation of transmitted digital histological and cytological images while being physically separated from the microscopic slides they were derived from (2). A basic telepathology system consists of conventional microscope with digital camera, computer optimized for graphics, telecommunication link between the sending and receiving station which also requires a high quality monitor to view the images, rather than seeing them through the microscope oculars.

### Types of Telepathology

The telepathology system has been developed into two main basic types (3).

- (a) Static Telepathology/Store and forward/Passive Telepathology.
- (b) Dynamic Telepathology/Robotic Interactive Telepathology (RITPATH).

### Static Telepathology

It is simple and cheap, requires only an internet connection and a telephone. But the recipient has no control over the images and only a limited number of images can be seen and moreover the images are static also. Any pathologist who is trained to see the cases in their entirety, this approach is troublesome. Also the referring pathologist shall always select the images which suit his own diagnosis and may intentionally or unintentionally ignore the less diagnostic areas. Thus, there is some room for error in static telepathology.

In spite of all these drawbacks, the concordance of many studies conducted by static telepathology has been found to be between 80-100% (4).

### Dynamic Telepathology (Ritpath System)

It has also been labelled as the "virtual microscope" (5). This system enables the receiving pathologist to control the movement of slide on stage of the microscope and see the real time images on the video monitor. This method is also capable of functioning as a bi-directional telepathology system. It has been found useful in studying frozen sections also. By this method an internet user can become a consultant for telepathology thus forming a network of teleconsultation (6).

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### Uses of Telepathology

It can be used for diagnosis, consultation, continued medical education and quality assurance as well.. It helps to remove the spatial constraints of physical proximity. It can also provide urgent services at places without a pathologist or for those pathologists who require a backup. Most of the times it is used to generate second opinion.

### Telepathology Services in India

As far as our country is concerned, telepathology is still a toddler here. But a very good beginning has been made by IAPM by bringing all pathologists on one platform. It has also issued a mailing list which is available at the website [www.pathoindia.com](http://www.pathoindia.com) (7). In this website apart from the availability of recent advances, diagnostic problems and job opportunities, telepathology is also an important component. It is being practised in the form of a "Quiz", where the relevant clinical history and static images of the histopathological/cytological/hematological slides are provided. The receiving pathologists send their opinions through the internet and there is an open e-mail discussion at the end of the week.

By using this telepathology circuit, an effort has been made to create a telepathology consultation services in

India. It will also allow any body to seek services of selected pathologists/cytologists/hematologists for diagnosis of difficult cases. Going by the responses available on [www.pathoindia.com](http://www.pathoindia.com), telepathology appears to be rapidly catching up the Indian minds.

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