Telemedicine Experience at Tata Memorial Centre, Mumbai

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Tata Memorial Centre
Need for Telemedicine

• Tertiary cancer center

• 39,271 new cases in the year 2015 (In addition 5488 cases of Preventive Oncology, 22439 Referral cards)

• More than 50% – 60% are from other states (Majority NE) ......India is diverse......

• Many come without prior investigations

• 10 – 20 % Palliative treatment only
Telepathology

606 cases from 2002 to 2007

Barshi, Osmanabad: January 2000
Karamsad, Gujarat: March 2002

500 km

TMH
Olympus Research Microscope
Model BX51

Digital Camera Olympus
Model C5060

Image Grabbing Software
(Analysis Software)

Computer with CD
Writer etc

Camera Olympus
Camera Model C5060
Telepathology Experience

1. Concordant / clinically useful diagnosis was rendered in 96.1% (surg path) and 90.6% (cyto) cases respectively.

2. Major diagnostic discrepancy was observed in 3.8% and 9.3% cases respectively.

3. The diagnosis was deferred in 30 and 5 cases respectively.

4. Images were of good and diagnosable quality in 87% and 94% cases respectively.

5. Turnaround time: 8 hrs in 48% of cases
   < 3 days in 91% of cases (week-ends)
Reasons for discrepancies

1. Potentially problematic cases

2. Selection of areas - Pathologist, Grabbing of images - Technician & not by pathologist himself in most cases.

3. Suboptimal quality of sections (35%)

4. Familiarity ............learning curve
Potential advantages
Telepathology

High speed of consultation
Low costs for access to additional data
Reduced time for initiation of adequate treatment
No losses of mailed specimens
Reduced isolation for pathologist
Reduced travel for patients
Potential advantages

Telemedicine

• Rural institutions get fast and direct access to accumulated advanced medical knowledge from modern medical centers.

• Reduced waiting time for the results and associated length of hospitalization.
CANCER TELEMEDICINE PROGRAMME

Tata Memorial Hospital
"CANTELMED"

Supported by:
Department of Atomic Energy & ISRO

2004-2007
Components

- Long distance consultations
- Second opinions
- Follow-up
- Tele-pathology / Tele-radiology
- Training Tool
- Distance education and Training
- Tele-health – Village Resource Centres
Objectives

- Improve access to cancer care to underserved.
- Export clinical expertise.
- Increase the availability of cutting edge cancer protocols.
- Standardize and ensure practice of Evidence Based Medicine across all the RCCs.
- Improve Quality of Care.
- Reduce costs of cancer care delivery.
- Reduce isolation in far remote areas.
Tele-consultation services provided

- Oncology
- Second opinion
- Follow-up cases
Opinion/Feedback from Doctors & Patients

Remote Site
- We feel secure about offering a treatment discussed during VC
- Patients feel encouraged after talking to their doctor at TMH.

Tata Memorial Hospital
- A better understanding of the pattern of diseases in other parts of the country.
- It feels good to be able to interact with colleagues and contribute.
Education

NKN Cloud

ACTREC

TMH NKN Room
Joint Clinic / Teleconsultation

TMH Local Area Network

Live Surgeries from OT

Live Events from Auditorium

Academic activities
The National Cancer Grid currently stands at 93 cancer centres, research institutes, patient advocacy groups and charitable organizations.
National Cancer Grid

Three main aspects –
1. Development of a cooperative cancer management network with data sharing, infrastructural, technology and expertise transfer
2. Facilitating uniform standards for education, training and human resource development in cancer care.
3. Creation of cooperative oncology research networks to perform research studies of national importance across the network and thereby improve the quality of cancer research in India
Virtual Tumor Boards involve discussions on how to best care for patients with cancer.

Case discussions may include:
• Patient’s medical history
• Treatment options
• Pathology review
• Clinical trial eligibility
• Psychological or social support issues
• Genetic counseling component
• Impact of previous treatment(s)
• The need for additional studies
• Staging
Virtual Tumor boards allow oncologists to:

- Draw on experiences from their own patients
- Tap specific or unique expertise of care team members
- Explore various options for clinical therapies, and
- Continuously expand and refine their knowledge base and refine their expertise to advance care.
Tata Memorial Centre & National Cancer Grid & Navya bring you evidence based expert treatment decisions in 3 steps

- Submission of medical reports
- Review by experts
- Collect expert opinion reports
Online Expert Opinion

To review patient’s medical reports and evidence based options to provide an opinion on what is the best treatment option specifically for the patient.

The expert opinion takes into account patient’s personal constraints and preferences.

Patient level meta-analysis of data....Empowering patient.
Research
Goals of Cancer Genome Research at ACTREC, TMC

- Identify changes in the genomes of tumors that drive cancer progression
- Identify new targets for therapy
- Select drugs based on the genomics of the tumor
“Using whole transcriptome analysis (next generation sequencing) to unravel the effect of pre-operative progesterone in operable breast cancer”
Bioinformatics in Genomics to deal with data deluge

• “the development and application of techniques from computer science, mathematics and statistics to address biological problems”

• How to store the data?

• How to analyze the data?

• How to extract information and knowledge from the data?
Bioinformatics in Genomics

NGS data

Database

Algorithm

Visualisation & interpretation of analyzed data

Bioinformatics applications are made up of many combinations...
Key deliverables from this project

• Discovery of targets that could be favorably modulated by the use of treatments similar to progesterone.

• Creation of bioinformatics capacity in high throughput datasets at collaborating institutions.
  – Development of new algorithms for analyzing RNA-Seq using parallel computing (Ref: IIT Group)
Current and future connectivity Infrastructure need

- Currently Progesterome Server is located at TMH Parel and being accessed via NKN connectivity from ACTREC, Kharghar.
- It will also be accessed by other research organizations like NIBMG(Kalyani, West Bengal), CDAC(Pune), IIT(Bombay) in near future.
- Amount of total Data Transfer required for analysis: ~200GB per week.
- Internet Bandwidth Required: at least 100 MBytes/second.
Staff Supporting NKN/Telemedicine

- Dr. Sangeeta Desai, Pathologist
- Dr. Devendra Chaukar, Surgeon
- Mr. Manoj Chavan - IT Officer ‘C’
- Mr. P. Karane - IT Officer ‘B’
- Mr. Amol Parbale - Technician
Thank You!