

Evolution of Knowledge Network in India migrating from ERNET to NKN



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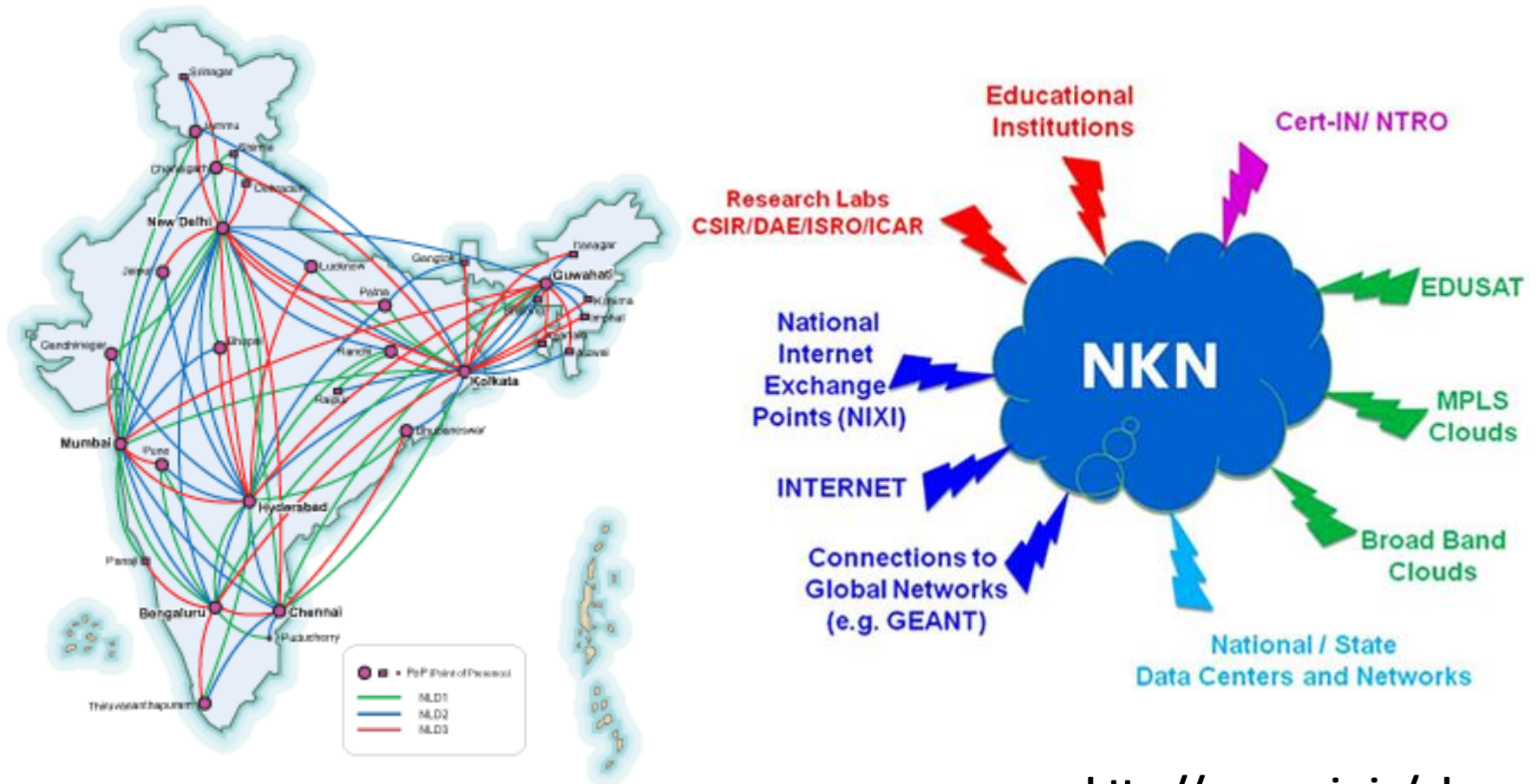
Sanjay Gandhi Postgraduate Institute of Medical Sciences,
Lucknow, India

Member, e-Health Technical Advisory Committee, WHO, Geneva

ERNET

- 1986 – Education Network in India started with Dial-up Network
- Department of Electronics (DoE), Govt. of India (GoI) with funding support from the GoI and United Nations Development Program (UNDP)
- 1988 – Education & Research Network; Scientific Society of MCIT, GoI
- 2010 - Migrated to NKN

NKN



Multiple 10G Connecting all the State Capitals
Gigabit Connectivity to all the 640 Districts

<http://www.nic.in/nkn>

Best example of NKN usage is virtual participation

- Faculty dropout avoided
- Local commitments honored
- Cost and misery of travel avoided
- Carbon footprint reduced
- No compromise in Interactive content delivery
- However, positive mindset needed for to adopt and adapt virtual presence
- Infrastructure logistics to be in place

Collaborative Environment for Group Learning Sharing Departmental Academic programme

- Case based / problem based learning
- On-line journal Club / Seminar / slide seminar
- No extra effort
- Larger faculty input
- Group benefits
- Starting point of clinical research collaboration
- Minor re-adjustment needed

Department of Endocrine Surgery, SGPGI with peers at CMC Vellore & SCB Medical College Cuttack once a month case discussion

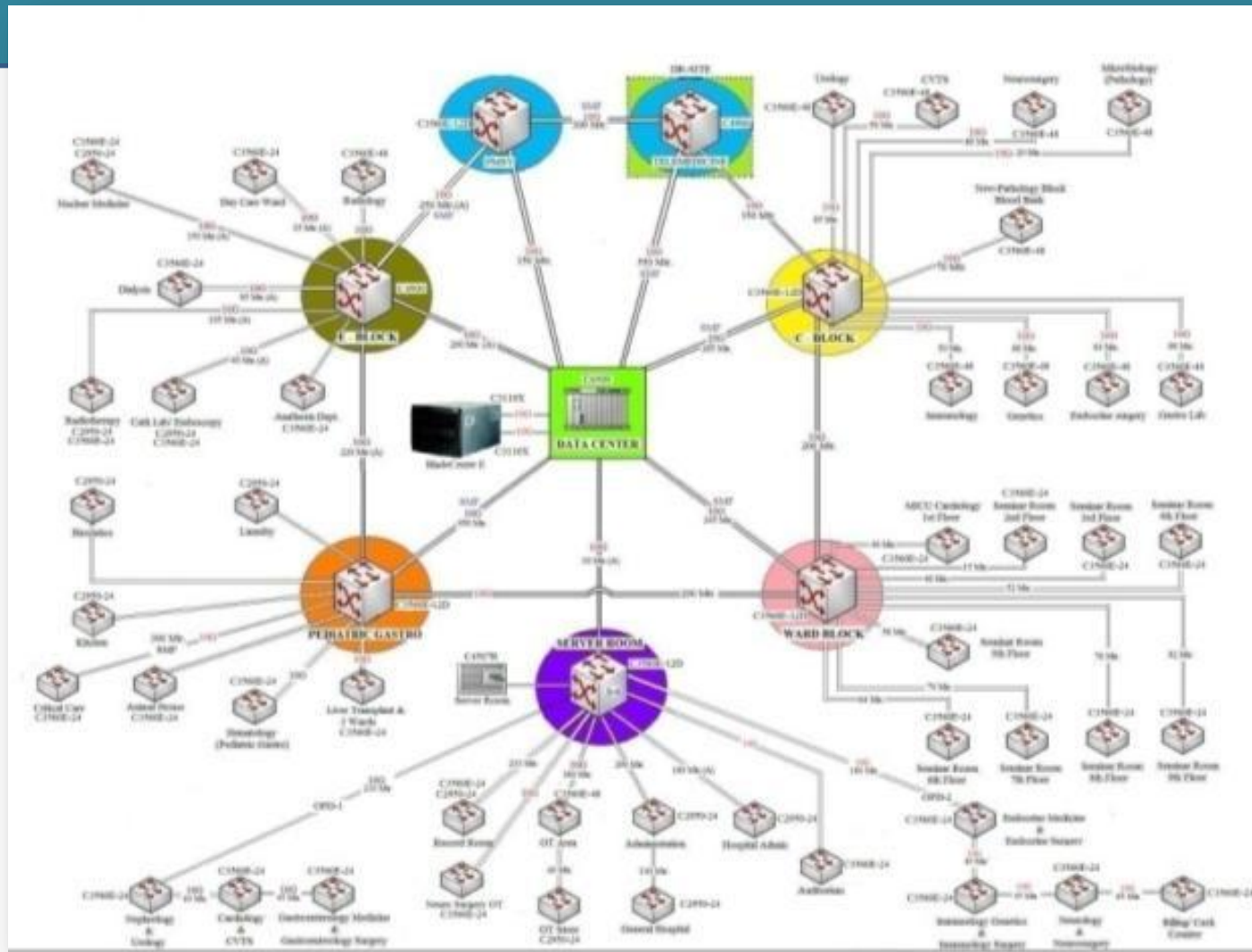


First virtual meeting of the Global Science Community (GSC) on e-Health; 04th October 2016

Bedside Teaching Collaboration

- It is said “Medicine is learnt at bedside”
- Clinical Case material shared
- Needs Telemedicine enterprise network
- At SGPGI – HIS network upgraded to 10g to piggy back Telemedicine
- Support simultaneous video traffic in addition to load of PACS
- Future hospital IT network – Single backbone with multiple applications
- SGPGI designed Telemedicine Kiosk- Model Tool Kit

Intra Hospital Telemedicine Network



SGPGIMS Knowledge Network Enterprise



Mobile Telemedicine Kiosk (Operational in Hospital LAN)



Mobile kiosk @ Patient's bedside



Doctor's Duty Room



Department's Seminar Room



Tele-Clinic in Out Patient Department

Remote access of skill by the Residents : mLearning Scenario

- Ward Duty Room, OPD Clinic
- Streaming on Hand held Devices, Smartphones, Tablets/Phablets etc. even when the resident on leave at home



- Surveillance,
saving time,
Multi-tasking,
mentoring
residents while in
/ out of campus



SGPGIMS – National Knowledge Network Partners



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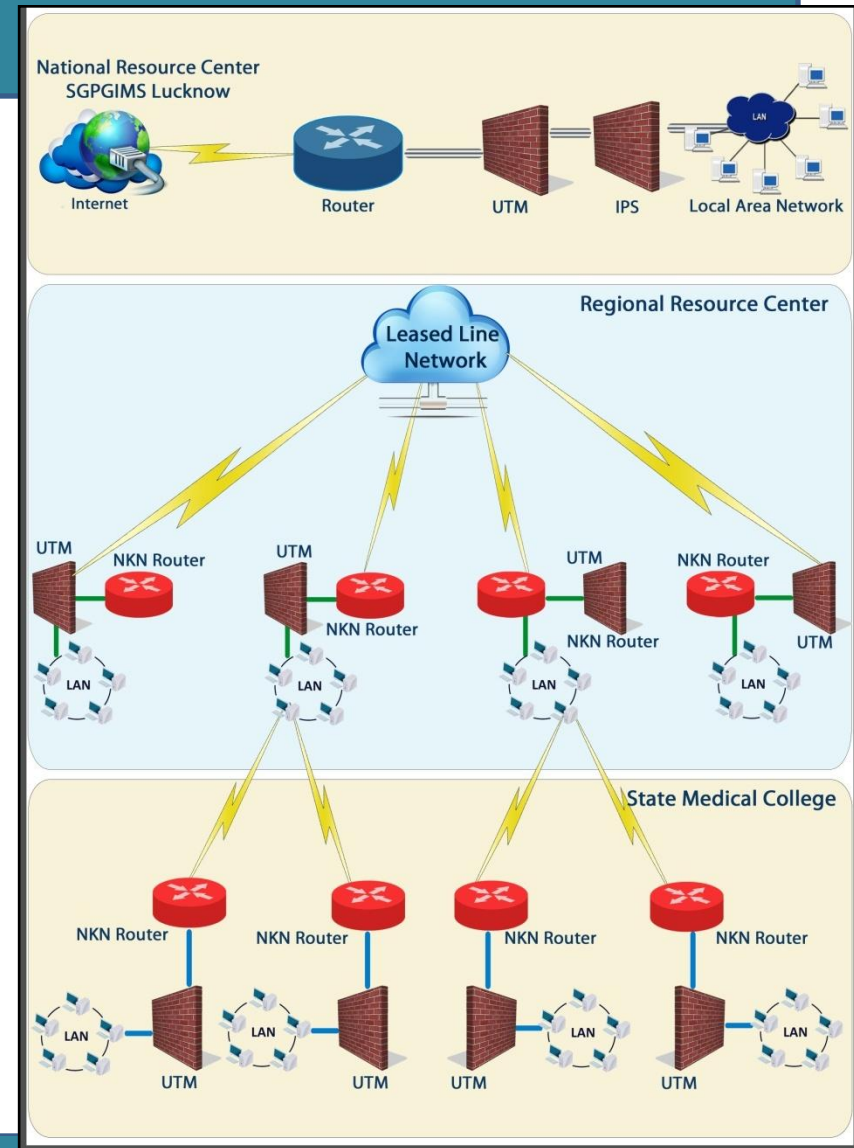
International Partners

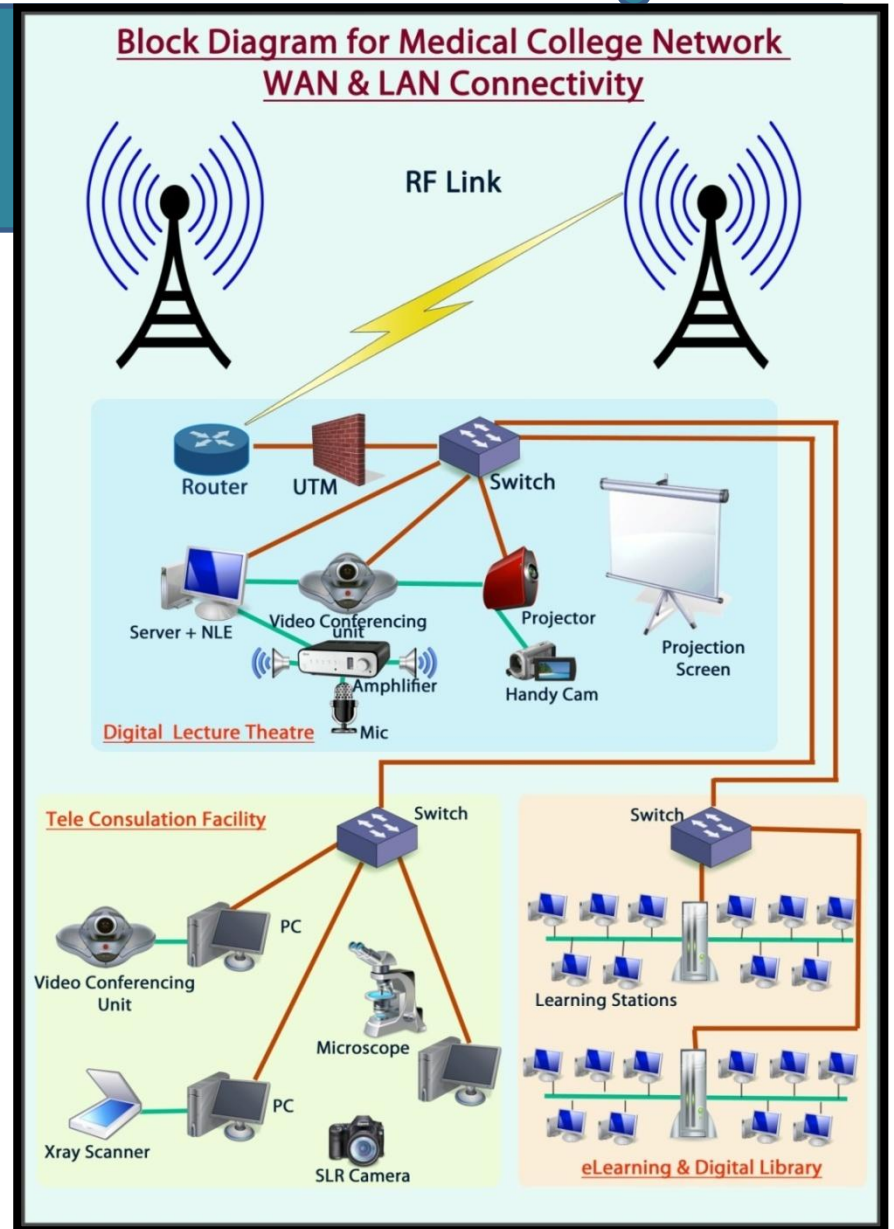
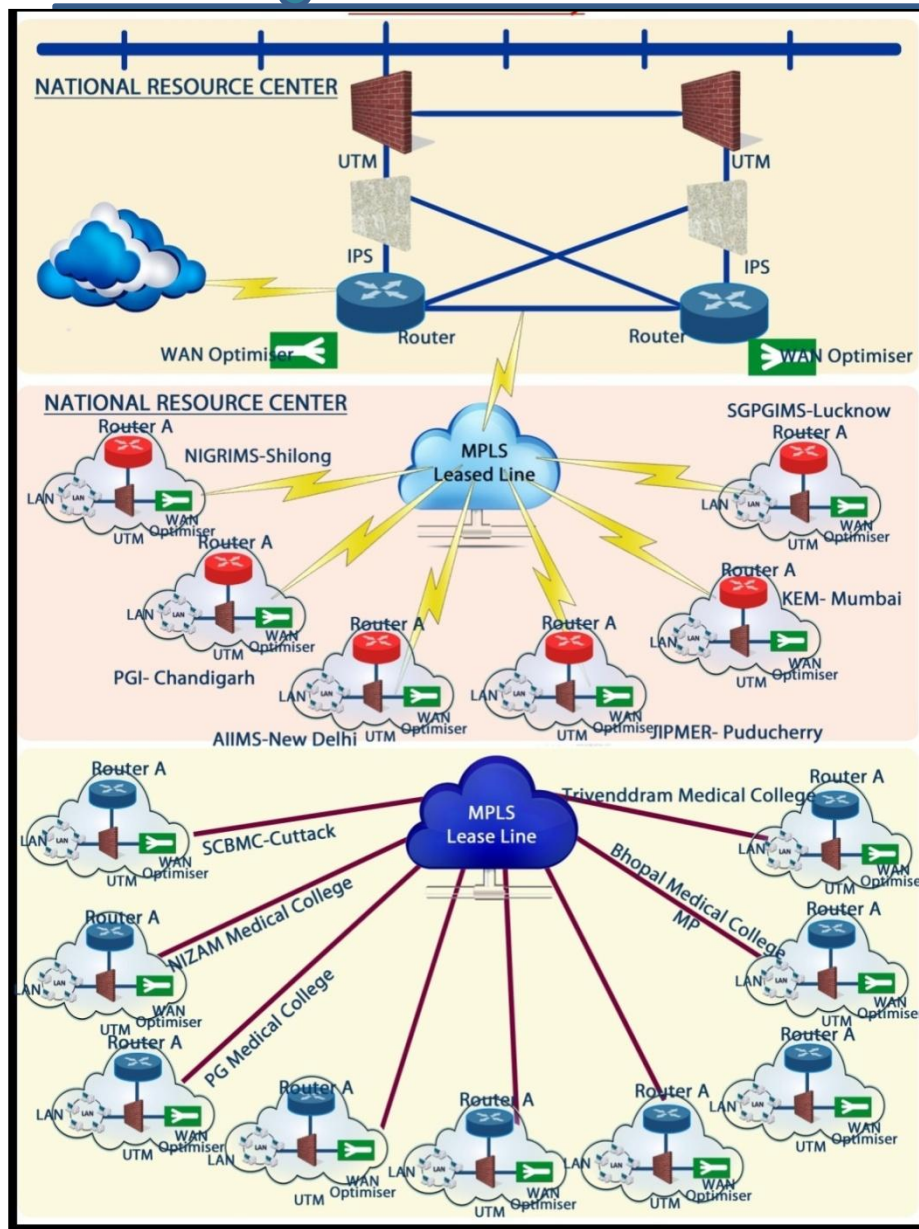


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Proposed System and Network Architecture of NMCN

- Funded by Ministry of Health & Family Welfare (MoH&FW)
- 363 Medical Colleges, 05 Regional Resource Centers (RRC) & 01 National Resource Center (NRC)
- NMCN would ride over High speed optic fiber backbone NKN





Surgical Telepresence for Skill sharing Surgiplex[®]



- SGPGI re-engineered surgical telepresence suite at 20% cost of commercial solution.

Integrated Operation Theatre for Tele-Surgery



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- Subject wise knowledge & skill repository

The screenshot displays the SGPGI Knowledge Park website. The header features the institution's name and address: Sanjay Gandhi Postgraduate Institute of Medical Sciences, Raibareli Road Lucknow, India. A breadcrumb trail indicates the user is in the 'Video' section. The 'VIDEO LIBRARY' section is active, showing a list of categories on the left and a grid of video thumbnails on the right. The categories include ISBMR Event, Course 01-02, Bioinformatics, Breast Surgery, Diabetes Workshop, Garuda Workshop, MHealth, Nucleoplasty, PhonoSurgery, Public Health & Awareness, SGPGIMS Tour, and Transplantation Immunology. The video thumbnails are organized into a grid, with the 'Communication' category highlighted. The first video in the grid is titled 'First Video on Course 01-02' by Dr. Anil Mandhani, Additional Professor, Urology, SGPGIMS Lucknow. Other visible video titles include 'Needle Prick Injuries and', 'Introduction to Medical Ethics', and 'Radiation safety and isotope'.

SGPGI Knowledge Park
Sanjay Gandhi Postgraduate Institute of Medical Sciences
Raibareli Road Lucknow, India

YOU ARE HERE: Video

VIDEO LIBRARY

CATEGORIES

- ISBMR Event
- Course 01-02
- Bioinformatics
- Breast Surgery
- Diabetes Workshop
- Garuda Workshop
- MHealth
- Nucleoplasty
- PhonoSurgery
- Public Health & Awareness
- SGPGIMS Tour
- Transplantation Immunology

ISBMR Event

Communication

Dr. Anil Mandhani, Additional Professor, Urology, SGPGI

First Video on Course 01-02
Dr. Anil Mandhani, Additional Professor, Urology, SGPGIMS Lucknow.

Needle Prick Injuries and
Dr. Anshu Srivastava, Dept. of Pediatric Gastroenterology, SGPGIMS Lucknow.

Introduction to Medical Ethics
Dr. Banani Poddar, Additional Professor, Dept. Of Critical Care Medicine, SGPGIMS Lucknow.

Radiation safety and isotope
Dr. S. Gambhir, Dept. of Nuclear Medicine, SGPGIMS

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Hi-Tech Lecture Theatre



Broadcast Quality Studio Camera



Network Monitoring Hub



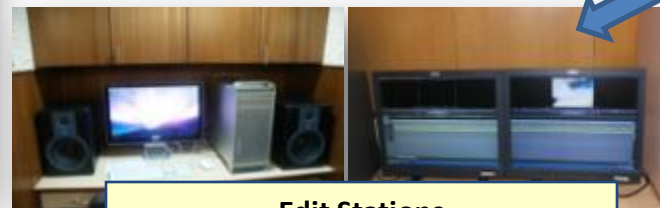
Integrated Operation Theatre



Production Control Unit (PCR)



Video Conferencing Suite



Edit Stations



Data Server

Integrated Networked Lecture Theatre/ Auditorium



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Production Control Room & Master control Room



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Knowledge Engineering, technology and Management Infrastructure Processing : Editing/Voice Over



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U.P. CPMT Counseling



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Data Center (National Resource Center)



Hospital Backup Servers

Web Servers, Mail Servers

Proxy Servers

Application Servers

Data & Video Storage

Video Bridge RMX 2000

Streaming Server RSS 2000

Video Scheduler

Wide Area Application Server (WAAS)

- **UP Medical College Network**
- **National Medical College Network**
- **National Knowledge Network**
- **SAARC Telemedicine & PAN Africa e-Network**
- **SGPGI Knowledge Network**

NKN for public health (Portable Tools)

Models Developed at SGPGI



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Telemedicine on Wheel



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National Optical Fiber Network (NOFN)

- NOFN to connect 2,50,000 Gram Panchayats (GPs) through Optical Fiber Connectivity
- Assured Bandwidth of 100Mbps at each GPs
- Approved by GoI on 25.10.2011
- NOFN Project will bridge connectivity gap between GPs and Blocks
- e-health, e-education, e-governance & e-commerce applications & Video conferencing facilities

http://www.itu.int/ITU-D/asp/CMS/Events/2012/ITP2012/K_Kminocha_Broadband.pdf

Conclusion

- SGPGI models are designed keeping in mind the stakeholder's requirement
- NKN resources should be utilized to its maximum potential.
- We need to share our experiments with the world what we can do with such national resources.
- We are the drivers, hence developing application modules is our responsibility.
- Technological skill should not be handicap. Can be learnt in collaboration with NKN group.
- If we can engineer the human health, engineering knowledge should not be a problem.
- Needs of convergence of minds between engineering and medicine

Thank You



Contact us at telemedicine@sgpgi.ac.in

www.sgpgi-telemedicine.org | www.stbmi.ac.in | www.nrct.in