Archive - Potential NGI Applications

High-Resolution ImagingTelemedicine:
sponsored by The National Institutes of Health

Categories

Medicine, Collaboration

Vision

Provide a means of remote medical consultations through the transmission of static high resolution images, such as x-rays, that must be comparable to photographic film.

Why NGI?

In order to transmit the large number of high resolution images often associated with a single patient's record (often about 500 Mbits of data), transmission speeds near 10 Mbits/sec would be necessary to send the images within the 1 minute considered acceptable.

Description

Medical diagnosis is often based on the observation and analysis of static high resolution images. These situations tend to be in the realm of different medical specialists which are not conveniently available in many communities. Telemedicine consultations would be very useful and practical in these circumstances. Such situations might include consultations with a radiologist, pathologist, dermatologist or ophthalmologist.

Rationale

The mission of the National Institutes of Health is to provide for advances in medical care. Many of these advances will be dependent on the presence of a high speed, low latency, secure digital information infrastructure as represented in the NGI program.

Medical advances discovered by the NIH have traditionally been transitioned to the private sector for further development.

Requirements

Bandwidth:
This category of medical diagnosis usually requires image quality which rivals that of large format photographic film. Although each individual picture could be transmitted in reasonable time with current technology, most of the specialties which would use this mode of telemedicine require the transmission of cases which may contain up to a hundred images or about 500 Mbits per examination. It would be preferred if an entire data set for a particular patient examination could be sent in under 1 minute (about 10 Mbits/second).

Latency:
Latency is not a factor in these applications as the images will be examined after the entire data set is received. The limiting factor for these applications is a total end to end transmission time of less than 1 minute.

Security:
These applications involves the transmission of real patient data which the patient may consider sensitive. It requires a high level of transmission security to be sure that it cannot be viewed or altered during transmission.

Reliability:
Except for very specific applications, the network should be highly reliable but absolute reliability is not a requirement as lack of network reliability will not result in life threatening situations. If there is a network problem, although it is inconvenient for all concerned, the consultation can be rescheduled.. However, in the case of a consultation resulting from a life threatening injury to a trauma victim, as close to 100% network reliability as possible is required.

Scalability:
This group of applications tend to be point to point applications and so will initially not require scalability. However, if viewed as a successful telemedicine applications, the bandwidth available on the network should be scalable so that the capacity can be increased in the future in response to potential increases in demand. Likewise, in the future additional interactive monitoring sites may be added so that such telemedicine consultations can also serve a useful teaching function which will require a degree of network scalability.

Partners and Potential Partners

Academic and private sector medicine.

URLs

http://www.nlm.nih.gov/research/telfront.html