

on misadministration information and that his office is taking steps to find a workable denominator for the total number of administrations.

Critics of the report have also expressed concern about its harsh stance on the Agreement States. "It is also suggested that Agreement States are not performing adequately as they report fewer misadministration errors than those supervised by the NRC," Dr. McCartney said. "However, it is at least as likely that the Agreement States simply run their programs more effectively than the larger and more cumbersome NRC and, thus, may have fewer actual misadministrations to report."

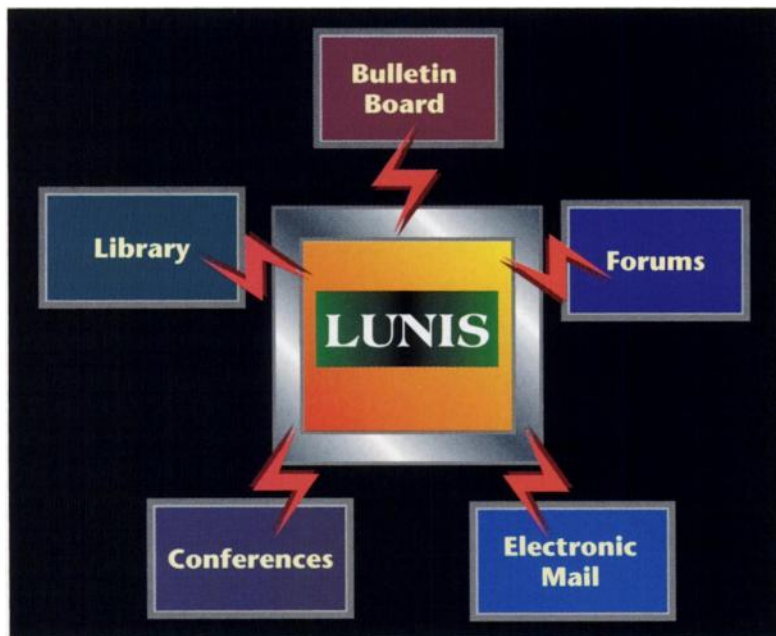
Instead of dealing with problems of misadministration information by creating more regulations, critics say, the NRC should seek simpler solutions. "In view of the infrequency of misadministration errors in radiopharmaceutical therapy

and the lack of proven negative patient outcomes related to such errors, it would appear that the prior NRC NMSS approach of careful individual review of specific incidents of misadministration was quite adequate," Dr. McCartney said. He recommended that before proposing further regulatory changes, the Commission might await the National Academy of Sciences study that it commissioned on the NRC's regulation of its medical licensees. Rather than rush into new regulations on radiopharmaceutical misadministration, "It seems evident that NRC should allocate its limited resources to other matters which might truly affect public health and safety," Dr. McCartney said. According to Dr. Marcus, many in the nuclear medicine community have been hoping as much for years.

Lantz Miller

COMMENTARY

COMMUNICATIONS AMONG NUCLEAR MEDICINE PROFESSIONALS: ONE APPROACH TO SHARING INFORMATION



INFORMATION IS POWER; LACK OF IT RENDERS one powerless. The ability to quickly transmit information from one location to another—by fax or the “data highway”—has become the hallmark of the 1990’s.

Nuclear medicine computers have existed since the late 1960’s. It is hard to find a nuclear medicine department today without

a computer. Many computers are networked within hospitals to share administrative or clinical information. But few are connected to the outside world.

Beginning in the late 1980’s, Loyola University (Chicago, IL) began experimenting with linking the nuclear medicine computers across the country into one communications network. The initial venture undertaken, with Loyola forming the educational base for a commercial nuclear medicine network, was financially unsuccessful. But it received rave educational reviews from the small portion of the nuclear medicine community that assessed it. When financial distress forced the nascent network to close, users asked if a replacement could be developed.

A project was quickly evolved and was presented to the administration of the medical school at Loyola University. We received approval to develop a pilot program to link nuclear medicine computers—both image processing and administrative—around the country into a single communications

network. Under the conceptual direction of myself and operational direction of James R. Halama, PhD, assistant professor of radiology and physicist in Nuclear Medicine at Loyola, the Loyola University Nuclear Information System (LUNIS) came online in a limited fashion within two months of the approval.

Unlike commercially based systems, LUNIS was designed

especially for nuclear medicine use. No commercial programming is used in LUNIS. All software was written at Loyola. LUNIS operates out of the VAX cluster in the nuclear medicine section of the medical center. It runs on exactly the same hardware that does the clinical and research image processing for most of the nuclear medicine section.

Conceptually, LUNIS was designed to have several functions:

1. **Bulletin Board:** This function is by far the most commonly accessed on LUNIS. There are now nearly 10,000 messages on the bulletin board. This is a free and open forum; anything—except blatant commercialism or obscene language—can be asked by anybody, and anyone can reply. Lively discussions occur on the bulletin board concerning medical, economic, and technical issues; there are approximately 2,500 logons to LUNIS per month with over 250 different users voicing opinions.

2. **Library:** The library system is designed for storage and retrieval of information which is not online. It has computer programs—often utility programs not directly connected with nuclear medicine—for Macintosh and IBM users. The library also supports the storage for teaching cases. Periodically, different LUNIS users will post teaching cases for display in the Graphics Interchange Format (GIF) developed by the CompuServe Information System. LUNIS provides public domain software to display these images on Macintosh or PC systems. Users are asked to download the image and post their answers on a special bulletin board in the library system.

From time to time, different users will post cases of a clinical nature where assistance is required. Rapid, free consultation is obtained from a broad spectrum of nuclear medicine practitioners. Any case posted typically has 50 to 100 people accessing and reviewing it.

3. **Conferences:** The least used but one of the most powerful of the LUNIS functions is the conferencing system. This electronic conference room permits a theoretically unlimited number of users to hold an online discussion simultaneously. LUNIS provides a moderator for the discussion. Users may schedule time in the conference room and log in from their PC systems at the scheduled time. Conference topics include key items in nuclear medicine, discussions of radiopharmaceutical applications, technical issues, and government relations—but because of federal regulations, not pricing issues.

During the conference, each user types in comments at the moderator's request. Comments appear on the screens of all users who are logged into the session. The system produces a conference transcript which can be downloaded later for review.

An alternative conferencing method allows an open conference room where people can wander in, look at what other people have said, and add comments to the conference transcript. This is a somewhat less restrictive environment as no moderator is required and one can review at leisure the existing transcript and note one's agreements or disagreements.

4. **Electronic Mail:** There are other system utilities of interest, including the ability to have an online chat with different users or send short messages. A sophisticated electronic mail system permits direct private communication between users.

Electronic mail may consist of information typed in on LUNIS or files containing text or images uploaded and sent directly to another user. Thus, a clinical case can be transmitted from one site to another without conversion to the GIF format as long as both sites have the ability to read the data format. This transmission is completely private, and only the sender and recipient have knowledge of the mail.

5. **Forums:** There are subsections of LUNIS for individuals with special interests. For example, health physicists have their own separate subsystem that contains a bulletin board that allows them to discuss items of special interest to the health physics community. The SNM Commission on Health Care Policy has a similar subsystem on LUNIS that permits them to communicate in their special area of interest without having to review all the general messages on the LUNIS bulletin board.

LUNIS Access

Access to LUNIS simply requires a password and ID. These are obtained by calling the nuclear medicine section at Loyola, (708) 216-3779, and requesting a LUNIS sign-up. The sign up is done by telephone, rather than online, for security reasons. Generally, the user is online within an hour of the time he or she requests a sign-up.

There is a myth that LUNIS access is difficult. Any computer with communication software can access LUNIS with either a modem or INTERNET connection for LUNIS access. For those individuals without access to the INTERNET system, an 800 telephone number for LUNIS exists. With telephone modems for computers at considerably less than \$100 and software equally inexpensive, for \$150 any existing PC can be converted to communicate with LUNIS. Systems such as VAX computers or other such systems can also communicate with LUNIS depending upon availability of appropriate communications software for those systems.

INTERNET users enjoy a special advantage: rapid LUNIS access from anywhere in the world. Approximately a quarter of LUNIS accesses are now through the INTERNET.

LUNIS was designed so that even the novice computer user can easily interact with the system: it is menu-driven, and has help screens clarify the different functions. If one judges a product by market response, LUNIS is in excellent shape. It has quickly grown from an obscure system used only by a few computer people to a generalized system used by 10% of the SNM membership. LUNIS remains grateful for the foresight of those commercial companies that have donated to maintain the 800 number telephone system.

The only constraints are in the minds of the users. LUNIS is an evolving system, responding to the users' needs by changes in software and interface. The solo physician or technologist no longer needs to be isolated. He or she is part of a large community, and both the social and professional benefits of interaction are readily available.

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