

## Correspondence

# Will G.E. Replace the M.E.?

In August, 1997, General Electric (G.E.) Medical Systems engaged in a mass mailing to medical examiners to promote their computerized tomography (CT) Synergy systems to supplement or even replace autopsies. According to their advertising brochure, one medical examiner prompted this technological endeavor to enhance the capabilities of his office in three ways: (1) increase department productivity by eliminating the need for autopsy in some cases; (2) increase productivity by helping to plan the autopsy to decrease total procedure time; and (3) provide an alternative to an autopsy when consent is not given.

As one might expect with a commercial advertising campaign, G.E. presented the advantage of a CT-scanner which would create detailed cross-sectional images of the human body by providing high-spatial and both low- and high-contrast resolution. Their CT-scanner is capable of distinguishing between normal liver tissue and lesions and resolve bone or metal fragments less than 1-mm in size. Image data can also be used to create 3D models of bones; perform volumetric analysis of organs or cavities; display sagittal, coronal, oblique, and 2D cut-planes, and simulate endoluminal views of hollow cavities. According to a New York sales representative (1), a 4-7-year-old pre-owned system would cost between \$225,000-525,000. The cost of a new machine, including installation, on-site training, and one-year warranty ranges from \$400,000-900,000. Maintenance costs depend on usage and the estimate for non-consumable items (everything excluding the X-ray tube) runs between \$30,000-60,000 per year. A new X-ray tube costs about \$50,000. Other hidden costs cover special building, room, and generator power requirements, as well as air-conditioning to keep the equipment cool. A trained, licensed radiology technologist is needed to operate the equipment and, depending on the geographic locale and level of experience, his/her salary can range from \$40,000-80,000 per year.

In 1996, we published an editorial against the use of endoscopy as a substitute for autopsy (2,3). The same opinions hold true for technological surrogates for the autopsy. Medical examiners have developed ways to satisfy the needs of ethnoreligious groups, the justice system, and medical examiners regarding consent for autopsy to avoid partial endoscopic procedures (4,5). Since some ethnoreligious groups opposed to autopsy reside in certain areas of the United States, these jurisdictions might be compelled to raise taxes of the United States, these jurisdictions might be compelled to raise taxes to defray the cost of such sophisticated equipment. Predictably, local political debates would ensue over the need for a costly CT-scanner.

The most dangerous aspect of this new technology is that it poses a direct threat to the livelihood of forensic pathologists. If this technology is adopted by medical examiners, it will certainly have a ripple effect on the staffing of offices throughout the country. Trained forensic pathologists will be replaced by technicians and radiologists to interpret post-mortem findings. Budgets will

be slashed and monies previously allocated to pathology personnel will instead be used for the installation and maintenance of computerized tomography. If this technology takes hold, profound economic ramifications can be expected.

The selection of cases of computerized tomography would also be at issue. We see no advantage over current radiological procedures in localizing bullets or tips of cutting instruments in deaths due to gunshot and cutting injuries, respectively. Once the radioopaque object is localized in the body, the autopsy surgeon is still compelled to retrieve the evidence and map out wound tracks. In cases of apparent drug overdoses, the body cavities would still have to be invaded in order to obtain samples of fluids and tissues for toxicology. In cases of natural death due to lung disease or cancer, tissue samples will still be needed to establish a causative microbiological organism or a histological type. Although standard X-rays are certainly adequate in deaths due to blunt force trauma (e.g., motor vehicle-pedestrian accidents and child abuse), computerized tomography may be of use in understanding anatomical structures which are not clearly viewed during the typical autopsy. There will be no appreciable value to CT-imagery in deaths due to asphyxia or drowning. Obviously, trace evidence would have to be carefully collected from corpses prior to CT examination. A list of cons can be argued ad infinitum.

We are in favor of any technique that will advance scientific knowledge. We feel that a well-performed autopsy is still the ultimate diagnostic tool which has successfully passed the test of time. Medical examiners should not jump on the band wagon of untested technology, especially when machines might be used to replace people. The autopsy can still bring good things to life.

## References

1. Personal communication. March 19, 1998.
2. Avrahami R, Watenberg S, Daniels-Philips E, Kahana T, Hiss J. Endoscopic autopsy. *Am J Forensic Med Pathol* 1995;16:147-150.
3. Taff ML, Boglioli LR: Endoscopy is not autopsy (Letter). *Am J Forensic Med Pathol* 1996;17:86-88.
4. Boglioli LR, Taff ML: Religious objection to autopsy: an ethical dilemma for medical examiners. *Am J Forensic Med Pathol* 1990; 11:1-8.
5. Mittleman RE, Davis JH, Kasztl W, Graves Jr., WM: Practical approach to investigative ethics and religious objections to autopsy. *J Forensic Sci* 1992;37:824-829.

Mark L. Taff, M.D.  
Associate Clinical Professor  
Department of Pathology  
Mt. Sinai School of Medicine  
New York, NY

Lauren R. Boglioli, M.D.  
Fellow  
Section of Cardiology  
Lenox Hill Hospital  
New York, NY