

Pathologists scan for options beyond autopsies

LONDON—Despite its value to clinical practice and medical research, use of the autopsy is in decline worldwide, in part as a result of changing attitudes and cost cutting. Researchers met in London last month to discuss how body scans can enhance and possibly one day replace some forms of one of the oldest medical practices.

The issue is of particular interest in the UK, which has one of the highest rates of autopsy in the Western world but where public confidence was severely damaged by a scandal at the Alder Hey Children's Hospital in Liverpool, when it emerged a decade ago that organs from children had been removed and stockpiled after autopsies. There is also reluctance among members of some religious groups to consent to the procedure, although consent is not required for autopsies ordered by a coroner.

A number of groups worldwide have been working on post-mortem imaging—or 'virtual autopsy'—which may offer an acceptable alternative to traditional autopsy in cases where there are family objections.

The primary driver, however, for the adoption of radiological scans is to enhance standard autopsies.

To date, there has been only limited evidence comparing such techniques directly to traditional autopsy. Early work from Ian Roberts, a pathologist at the John Radcliffe Hospital in Oxford, showed that magnetic resonance imaging (MRI) could identify some abnormalities in people with sudden death, but the scans could not detect, for example, coronary artery lesions (*Histopathology* 42, 424–430, 2003). Other research has shown the utility of scans in identifying conditions such as hemorrhage (*Korean J. Radiol.* 11, 395–406, 2010).

Now the UK Department of Health is sponsoring further research directly comparing the results of post-mortem scans using computed tomography (CT) and MRI against conventional autopsy in 200 adults to plug the knowledge gap. On 21 October, at the Royal Society of Medicine in London, the preliminary results were presented.

Speaking before the meeting, as *Nature Medicine* went to press, Giles Maskell of the Royal College of Radiologists in London says that noninvasive autopsies still have a way to go. "What we've heard so far is it shows promise, but it has significant deficiencies," says Maskell, who organized the meeting last month. "Particularly cardiac causes of death and some lung problems are very difficult to detect with scans."

As such, he adds, "the wholesale replacement [of traditional autopsy] is still a long way away."

One stumbling block to wider use of post-mortem imaging has been access to scanners. Although this has been a problem for forensic pathologists—who sometimes have to scan at night—the newly opened Maryland Forensic Medical Center in Baltimore has a dedicated whole-body CT scanner earmarked exclusively for forensic use.

"What we're just beginning to see here in the States is the situation where some of the larger and more progressive systems are beginning to get CT scanners and site them at the major forensic medicine centers," notes Barry Daly, a

radiologist at the University of Maryland School of Medicine in Baltimore.

As the field grows, post-mortem imaging may even feed back useful information to more basic medical researchers. Maskell notes that for some conditions—such as a variant Creutzfeldt-Jakob disease—post-mortems were vital in the understanding of the disease.

"There's a long history of conventional autopsy being externally valuable," he says. "Whether imaging will help in the same way is not yet clear."

Daniel Cressey

Basic animal research on the rise while pharma looks to new options

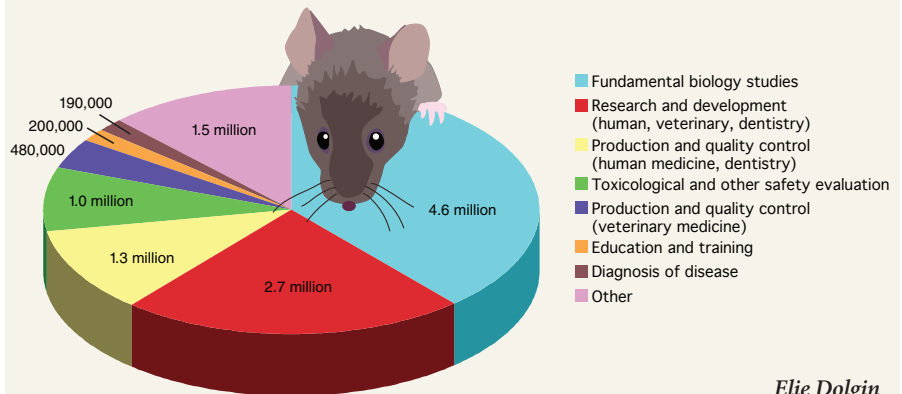
Drug companies in the EU are increasingly turning to nonanimal strategies to test medicines, but the number of animals used for basic research is on the rise, according to statistics published 30 September by the European Commission.

Although the total number of animals used for scientific purposes in the EU's 27 member states has held steady at around 12 million per year, this overall figure masks shifting trends in animal experimentation. The European Commission report, which documents data submitted for 2008, shows that studies investigating basic biological principles used approximately 4.5 million research animals—up by more than half a million from 2005. In contrast, the number of animals used in the drug discovery pipeline for human and veterinary medicines dropped by more than a million to 2.7 million animals over the same period. Toxicology testing remained constant at about 1 million animals.

"What we're seeing at the moment is a steady increase in the number of animals that are genetically modified" for basic investigations, says Simon Festing, chief executive of Understanding Animal Research, a proresearch advocacy group in London. But he adds that at the same time "there is continued pressure, particularly in safety testing, to reduce the number of animals used. This can be achieved by new technologies, from computer simulations to stem cells."

Thomas Hartung, director of the Center for Alternatives to Animal Testing at Johns Hopkins University in Baltimore and former director of the European Centre for the Validation of Alternative Methods in Ispra, Italy, notes that pharma's move to alternative testing strategies has proven to be a boon for the industry. "This has helped the drug industry enormously to bring down their attrition rates" for investigational compounds put into clinical trials, he says.

Here's where Europe's 12 million animals are being used:



Elie Dolgin