



## Improving Research in Forensic Radiology and Imaging



Forensic radiology and imaging is a relatively new field within the realm of forensic science and medicine. It's important to establish a rigorous base of scientific evidence that will make forensic radiology a reliable, precise, and valuable source of information in medicolegal death investigations, according to a paper published in *Journal of Forensic Radiology and Imaging*.

**See Also:** ['Poor Quality' of Radiology-Related Information Online](#)

The report presents the outcome of the first international forensic radiology and imaging research summit held last year. During this meeting, an international and multidisciplinary panel of forensic scientists drafted a research agenda to further advance the field. Four areas for further research focus were identified: big data and statistics, identification and biological profiling, multimodal imaging, and visualisation and presentation.

### **Big Data & Statistics**

There has been a rapid increase in the number of publications within the field of post mortem imaging, mostly published in journals devoted to forensic sciences and fewer in radiology journals. The existing scientific literature is, however, mostly based on case reports and relatively small case series with a marked variability in quality and methodology used. Larger and better-designed studies are therefore needed.

Priority must be given to an international agreement on diagnosis coding. This would facilitate international cooperation on research projects and also facilitate meta-analyses and comparisons of scientific studies. Establishment of national and international research groups should be encouraged. The international cooperation regarding post mortem angiography is an example of such international cooperation.

### **Identification and Biological Profiling**

The use of radiological imaging techniques is quickly gaining momentum in the identification and/or biological profiling of living and deceased individuals. Especially in forensic investigation, the biological profile of an individual generally consists of four components: sex, age, stature, and ancestry. The assessment of age is an often encountered problem in forensic cases. In living individuals (e.g., refugees), radiological analysis may provide an objective method of age estimation, which can be used to corroborate testimonies or questionable identity documents. Despite some early work, further research is needed to evaluate the validity of current scoring techniques, to develop non-ionising techniques (i.e., MRI), and the application of multiple measurement

sites.

For any forensic radiological investigation related to identification, thought has to be given on how to present the virtual anthropological data and how to fit them into international protocols, such as the Interpol Disaster Victim Identification forms.

### **Multimodal Imaging**

CT and MRI, which are standard tools of clinical medicine, are now increasingly being studied and applied in the context of medicolegal death investigation or forensic cases requiring evaluation of living subjects. There has recently been an tremendous increase in techniques related to image capture and processing that open new possibilities for merging image information obtained by one or more modalities over multiple length scales or at multiple points in time and visualising the information in new ways.

Potential topics of research in this area include new methods for merging images, 3D and 4D displays, including animation to display changes in time, length scale (i.e., zooming), or viewing angle, interactive images that link to additional images or non-imaging data, and virtual reality.

### **Visualisation & Presentation**

The visualisation and presentation of data differ depending on the user of the data. The users described specifically in this paper are the radiologist, pathologist, and courts. The caveat to using data is that the quality of the data is dependent on the quality of the image. The protocol for acquiring images affects image quality, and research is needed to determine the ideal acquisition protocols for both living and deceased individuals.

The presentation of evidence in court has developed according to legal precedent and custom. No study has determined what types of scientific evidence are most effective in providing reports or testimony for court. Research concerning the presentation of evidence can assess usefulness of autopsy images, radiology images, and 3D models.

Source: [Journal of Forensic Radiology and Imaging](#)

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