A migrating pacemaker
C P Gale, G P Mulley

A deceased 79 year old man with a permanent cardiac pacemaker was due to be cremated, but the pacemaker generator was not detectable by palpation. A hand held metal detector was used to locate the device so that it could be extracted before cremation.

DISCUSSION
Pacemakers may migrate in the subcutaneous tissue, making detection by palpation difficult. This may explain why some pacemakers remain in bodies that are cremated. Pacemakers may also be placed in the epigastric region at the time of cardiac surgery and will not be immediately apparent. It is important that doctors are aware of the implantation sites of pacemakers (fige 2) as well as their potential to migrate through the subcutaneous tissue. Pacemakers are the commonest active implantable medical device in the UK (over 17 000 pacemakers are implanted annually, giving a pacemaker prevalence of 250 000). Elderly patients now represent an increasing proportion of the paced population, so the prevalence of pacemakers in those who have died will increase. Doctors who sign cremation forms must provide accurate information because pacemaker explosions are potentially distressing and costly for the crematorium owner (and may lead to legal proceedings against funeral directors, physicians, and health authorities). This is important because at present, mortuary staff in the UK do not routinely use hand held metal detectors, and inconsistencies in the documentation have been noted.

The MD-3003 is a hand held metal detector, powered by a 9 volt battery and is designed for use in the security industry. It signals the presence of metal by means of a red and green light emitting diode and speaker that emits a high pitched tone. Hand held metal detectors are able to identify many types of metallic objects but are less dependable for objects that are as small as a needle. The device is easy to use, safe, and requires minimal training. We have found that false positive results are commonly generated when the body is placed on a standard metallic mortuary trolley, although our preliminary findings suggest that using metal detectors has a good negative predictive value.
The use of the hand held metal detector to locate metallic objects in humans is already established. They have been used to find metallic objects in wounds,\textsuperscript{10,11} to detect bullets after death,\textsuperscript{12} and to disclose concealed weapons at airports and hospitals.\textsuperscript{13} They have been used to detect orthopaedic implants\textsuperscript{6} and to screen for ingested metallic foreign bodies.\textsuperscript{14}

The use of hand held metal detectors to screen bodies for pacemakers before cremation may not be new. We understand they are used in some crematoriums in the USA to detect the presence of pacemakers, although there are no published reports. We suggest that the hand held metallic detector may be used to locate pacemakers that would otherwise be difficult to recover.

**CONCLUSION**

Some bodies contain multiple generators either for pacemakers or other implantable devices and some devices may migrate. The use of a commercially available hand held metal detector swept over the thorax of the deceased by mortuary staff and funeral directors may improve the detection of pacemakers and other implantable devices and could help prevent explosions in crematoriums.

**REFERENCES**


**AUTHORS’ CONTRIBUTIONS**

Dr C P Gale was responsible for the detection of the implanted pacemaker using a hand held metal detector and writing the article. Professor G P Mulley was responsible for reviewing the article before submission and overseeing the work.

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![Figure 2](http://pmj.bmj.com/content/159/7/199/F2.large.jpg)
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