



CLINICALLY RELEVANT QUESTIONS

Will my joint replacement make the airport metal detectors go off?

Since the tragic events in New York on September 11th 2001, airport security worldwide has been heightened significantly. Patients have become increasingly concerned about whether their hip or knee replacements might set off metal detection systems causing additional travel times and anxiety.

Studies published on this topic before September 11th 2001 suggested that this was less likely^{1,2}. More recent studies^{3,4} in 2007 which examined metal detection commonly used in USA airports have shown that orthopaedic implants are now more likely to be detected.

- In recent studies 90% of total knee replacements and 100% of total hip replacements activated the security screening machine.
- Patients with total hip and total knee replacements can expect to be routinely detected by airport security metal detectors.
- In the past, a note from an Orthopaedic Surgeon, or a credit card sized identification card may have been accepted by airport security. This type of documentation may no longer be enough to get you out of having additional security checks. An identification card may however assist to confirm the results of the screening with hand-held metal detectors and manual pat-downs by airport security officers.
- Patients who have joint replacement surgery will need to expect to be taken to a secondary screening checkpoint when passing through airport security.
- Patients need to allow additional time to pass through security checkpoints when travelling.





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Detection

In recent studies 100% of total hip replacements and 90% of total knee replacements were detected when passing through airport security metal detectors. This was much higher than for other orthopaedic metal implant types such as plates (32% detected), screws (18% detected).

The American Academy of Orthopaedic Surgeons recommended in 2001⁵ that Surgeons 'consider writing notes' for patients with metal implants that they could show to security staff. It is routine in my practice to provide patients with hip and knee replacements with an 'airport card' that they can produce from their wallet to show to airport security. This still may not be enough to preclude secondary security screening but may assist to confirm the amount of metal involved.



Factors influencing detection:

- Implant – joints more than plates
- Material – cobalt/chrome replacements more than stainless steel
- Location – lower limb more than upper limb



1. Pearson WG, Matthews LS. Airport detection of modern orthopaedic implant metals. Clin Orthop Relat Res. 1992;280:261-2.
2. Van Rhijin LW, Veraart, BE. [Metal detectors for security checks mostly insensitive for metal implants]. Ned Tijdschr Geneesk. 1994;138:825-7. Dutch.
3. Ramirez, MA, Rodrigues, EK, Zurakowski, D, Richardson, L. Detection of orthopaedic implants in vivo enhanced-sensitivity, walk-through metal detectors. J Bone Joint Surg Am. 2007;89:742-6.
4. Obrensky, WT; Austin, T; Crosby, C; Driver, R; Kurtz, W; Shuler, F; Kregor, P. Detection of orthopaedic implants by Airport Metal Detectors. J. Orthop. Trauma. 2007;21:129-32.
5. American Academy of Orthopaedic Surgeons. Travellers with implants face increased scrutiny from airport security. 2004 March 10. http://www6.asos.org/news/pemr/archive_year.cfm?archiveyear=2004. Accessed 2006 Mar 25.