

REPORT OF THE COUNCIL ON ETHICAL AND JUDICIAL AFFAIRS\*

CEJA Report 5-A-07

Subject: Radio Frequency ID Devices in Humans

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Referred to: Reference Committee on Amendments to Constitution and Bylaws  
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1 INTRODUCTION

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3 Radio frequency identification (RFID) tags are computer chips connected to miniature antennae  
4 that can be used to transmit information electronically via a proximate RFID reader. The use of  
5 these devices in health care represents another promising development in information technology,  
6 but also raises important ethical, legal and social issues. Specifically, the use of RFID labeling in  
7 humans for medical purposes may improve patient safety, but also may pose some physical risks,  
8 compromise patient privacy, or present other social hazards.

9  
10 This report responds to Resolution 6 (A-06), "RFID Labeling in Humans," which called for study  
11 of the medical and ethical implications of RFID chips in humans. This report focuses on ethical  
12 issues in the use of RFID chips, specifically in regard to their implantation for clinical purposes.

13  
14 BACKGROUND

15  
16 Radio frequency identification devices utilize wireless technology to communicate data via signals  
17 in the radio frequency range of the electromagnetic spectrum. Data are stored in a microchip  
18 attached to an antenna, and packaged so that they can be attached to or embedded in products,  
19 animals, or people.

20  
21 The two main types of RFID tags are passive and active. Passive tags contain no internal power  
22 supply. They convert the radio frequency energy emitted from a reader device into signals that  
23 transmit stored data for a distance of a few feet. These passive devices currently have restricted  
24 amounts of data storage and are of limited functionality, because the information they contain  
25 cannot be modified.

26  
27 In comparison, active RFID tags contain an internal battery, which provides increased reliability,  
28 longer transmission ranges, on-tag data processing and greater data storage.<sup>1</sup> While their capacity

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1 to process data internally allows for expanded capabilities in the future, their greater transmission  
2 range presents a more substantial threat to data confidentiality and patients' privacy.  
3 In October 2004, the US Food and Drug Administration (FDA) approved the first RFID tags  
4 specifically intended for human implantation.<sup>2</sup> Approved RFID devices are currently limited to  
5 passive units, intended for identifying patients. Active RFID chips may be approved in the future.

6  
7 Human-implanted passive RFID devices that identify patients may also contain essential biometric  
8 and medical information. The tags are primarily intended for patients with chronic diseases, such  
9 as coronary artery disease, chronic obstructive pulmonary disease, diabetes mellitus, stroke or  
10 seizure disorder, or are implanted into patients with medical devices such as pacemakers, stents, or  
11 joint replacements. These devices are approximately the size of a grain of rice, and are implanted  
12 under the skin via a hypodermic-type needle in less than one minute.<sup>3</sup>

#### 13 14 INFORMATION SYSTEMS

15  
16 RFID tags may promote the timely identification of patients and expedite access to their medical  
17 information. As a result, these devices can improve the continuity and coordination of care with  
18 resulting reduction in adverse drug events and other medical errors.<sup>4</sup>

19  
20 RFID tags also may improve efficiency within the health care system. In conjunction with  
21 improved medical record management, these devices may facilitate access to patient records,  
22 medication lists, and diagnostic tests.<sup>5</sup> To be maximally effective, however, the information in  
23 these devices must be adequately integrated into present clinical information and communications  
24 systems, laboratory databases, and pharmacy systems.<sup>1</sup>

25  
26 Appropriate processes also must be developed to inscribe, read and archive data stored on RFID  
27 tags. As new designs enter the marketplace, the emergence of competing standards may present  
28 problems for hospital staff if a patient's ID tag proves incompatible with the interrogation devices  
29 employed by the hospital.<sup>1</sup>

#### 30 31 PHYSICAL RISKS TO PATIENTS

32  
33 These devices may present physical risks to the patient. Though they are removable, their small  
34 size allows them to migrate under the skin, making them potentially difficult to extract. However,  
35 this tendency may be minimized by constructing RFID tags from materials that permit surrounding  
36 tissue to encase the device. In addition, RFID tags may cause electromagnetic interference, which  
37 may interfere with electrosurgical devices and defibrillators.<sup>1</sup> Finally, it has not been determined  
38 whether RFID tags might affect the efficacy of pharmaceuticals.<sup>1,6</sup>

#### 39 40 PATIENT PRIVACY AND SECURITY

41  
42 The primary concerns surrounding human RFID labeling pertain to their potential impact on patient  
43 privacy and security. Physicians must assure patients that their medical information will be held in

1 confidence (see Opinion E-5.05, “Confidentiality”). Moreover, maintenance of privacy is required  
2 to protect patients from embarrassment, potential social discrimination, loss of health care  
3 coverage, or other detrimental consequences (see Opinion E-5.059, “Privacy in the Context of  
4 Health Care”).

5  
6 At this time, the security of RFID devices has not been fully established. Physicians, therefore,  
7 cannot assure patients that the personal information contained on RFID tags will be appropriately  
8 protected. In light of these security concerns, the FDA currently requires RFID transponders to  
9 store only a unique electronic identification code to be read by the scanner.<sup>2</sup> This identification  
10 code can then be used to access patient identity and corresponding health information stored in a  
11 database.

12  
13 To protect confidentiality and privacy, the medical community should advocate for the adoption of  
14 other protections, such as computer encryption or digital signatures. Ultimately, the medical  
15 community should undertake appropriate efforts to prevent unauthorized access to patients’  
16 information contained on RFID tags (see also E-5.07, “Confidentiality: Computers,” AMA Policy  
17 Database).

#### 18 19 INFORMED CONSENT

20  
21 To properly respect patient autonomy, RFID tags should not be implanted or removed without the  
22 prior consent of patients or their surrogates (see E-8.08, “Informed Consent,” and E-8.081,  
23 “Surrogate Decision Making”). During the consent process, decision-makers should be informed  
24 of the potential risks and benefits associated with RFID tags, including the many uncertainties  
25 regarding their efficacy. Patients are also entitled to know who will be granted access to the data  
26 contained on RFID tags and the purposes for which this information will be used.<sup>7</sup>

#### 27 28 FURTHER CONSIDERATIONS

29  
30 It seems likely that utilization of RFID devices for medical purposes will expand.<sup>4</sup> The medical  
31 profession must continue to monitor the efficacy of these devices. If RFID tags are proven to  
32 benefit patient care significantly, the profession should advocate for widespread adoption of RFID  
33 technology, and for policies that make RFID tags available to all patients who would benefit (see  
34 Opinion E-2.095, “The Provision of Adequate Health Care”).

35  
36 However, if objective evidence demonstrates negative consequences that outweigh the benefits in  
37 relation to health care, the medical profession will bear an important responsibility to oppose the  
38 use of RFID labeling in humans.

39  
40 Finally, physicians should be aware of emerging non-medical applications of human-implantable  
41 RFID devices. For instance, active RFID technologies might be considered for the tracking or  
42 surveillance of individuals who pose a threat to others. Although this is only one of many possible  
43 uses of RFID technology in the future, it alerts the medical profession to the need for continuous

1 assessment of the appropriate role of physicians participating in RFID labeling of human beings.  
2 Indeed, certain uses could constitute an infringement upon patients' individual liberties, placing  
3 physicians in a position to act as patient advocates by promoting the use of other, less intrusive  
4 alternatives, when available.<sup>4</sup>

5

6 CONCLUSION

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8 RFID technology has the potential to improve patient care as well as patient safety. However, the  
9 safety and efficacy of human-implantable RFID devices has yet to be established. Therefore, the  
10 medical community should support further investigations to obtain the data necessary to make  
11 informed medical decisions regarding the use of these devices. The medical community should  
12 also be sensitive to potential social consequences of RFID devices, such as non-medical  
13 applications in law enforcement.

14

15 RECCOMENDATION

16

17 The Council on Ethical and Judicial Affairs recommends that the following be adopted and the  
18 remainder of the report be filed.

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20 Radio frequency identification (RFID) devices may help to identify patients, thereby improving  
21 the safety and efficiency of patient care, and may be used to enable secure access to patient  
22 clinical information. However, their efficacy and security have not been established.  
23 Therefore, physicians implanting such devices should take certain precautions:

24

25 (1) The informed consent process must include disclosure of medical uncertainties  
26 associated with these devices.

27

28 (2) Physicians should strive to protect patients' privacy by storing confidential  
29 information only on RFID devices with informational security similar to that required  
30 of medical records.

31

32 (3) Physicians should support research into the safety, efficacy, and potential non-medical  
33 uses of RFID devices in human beings.

34

35 (NEW HOD/CEJA Policy)

Fiscal Note: Staff cost estimated at less than \$500 to implement.

**REFERENCES**

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- <sup>4</sup> Wicks, AM; Visich, JK; Li, Suhong. Radio Frequency Identification Applications in Hospital Environments; *Hospital Topics*.2006; 84(3): 3-8.
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<http://www.rfidjournal.com/magazine/article/1739/1/173/>
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