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Initial Post

by [Yousif Ali Karam Yousif Almaazmi](#) - Friday, 8 August 2025, 6:12 PM

The ACM case study on Medical Implant Risk Analysis focuses on a fictional medical technology Company called Corazon, which manufactures implantable heart-health monitoring devices with an accompanying smartphone application. The firm ensured secure practices, such as standard cryptography processes, encrypted and local data storage, and an open bug-bounty plan to identify weak points (Tallapaneni et al., 2022). When a security researcher showed a proof-of-concept attack with hard-coded initialization values that could be used to manipulate commands to devices, the Corazon engineers decided that the threat was insignificant. To this end, the reaction of the company was done based on being transparent, teamwork with the security community, and upholding principles set out in the ACM Code of Ethics, like contribution to society, harm avoidance, respect for privacy, and conducting thorough analysis of the risks (ACM, n.d.).

Legislative systems like the U.S. Food and Drug Administration's medical device regulations and the European Union's Medical Device Regulation control implantable medical devices. Adherence to the product and data safety standards is vital, yet morality is more than a set of laws. Addressing any vulnerability, including low-risk, is crucial, and failing to do so may result in a loss of reputation, lawsuits, or penalties (Vallet-Regí et al., 2024). Socially, trust in medical technology is based on computing professionals' competence, integrity, and proactive security practices. The involvement of external researchers and continued security policies at Corazoon represented social responsibility and increased trust between patients and caregivers.

The British Computer Society (BCS) Code of Conduct supports the idea of ACM codes. Still, it stresses the enforceable duties of protecting public interest, working with competence, and reporting violations. On the one hand, ACM provides general guidelines; on the other, BCS combines these ideals with specific responsibility and punitive systems. The two frameworks emphasize preserving public health and privacy, professional competence, and transparency (Cano-Martínez et al., 2022). How Corazon managed the vulnerability explains how civil codes inform decision-making processes, as the technical actions are taken about professional principles and a sense of social welfare.



## References

Association for Computing Machinery. (n.d.). *Medical implant risk analysis*. ACM. Available at: <https://www.acm.org/code-of-ethics/case-studies/medical-implant-risk-analysis> (Accessed: 7 August 2025).

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Tallapaneni, V., Bhaskaran, M., Karri, V. V. S. R., & Parvathaneni, M. (2022). The Role of Computers and Ethics in Pharmaceutical Research. *NEUROQUANTOLOGY*, 20(11), 7987-8001. Available at: [https://www.researchgate.net/profile/Vyshnavi-Tallapaneni-2/publication/366672830\\_The\\_Role\\_of\\_Computers\\_and\\_Ethics\\_in\\_Pharmaceutical\\_Research/links/65ef5dccaaf8d548dcc33809/The-Role-of-Computers-and-Ethics-in-Pharmaceutical-Research.pdf](https://www.researchgate.net/profile/Vyshnavi-Tallapaneni-2/publication/366672830_The_Role_of_Computers_and_Ethics_in_Pharmaceutical_Research/links/65ef5dccaaf8d548dcc33809/The-Role-of-Computers-and-Ethics-in-Pharmaceutical-Research.pdf) (Accessed: 7 August 2025).

Vallet-Regí, M., Alarcón, A. D., Barrena, E. G., Planell, J. A., Silva, J., & Bouza, E. (2024). New materials and complications of prostheses in humans: Situation in Spain. *Revista Española de Quimioterapia*, 37(5), 369. Available at: <https://doi.org/10.37201/req/039.2024> (Accessed: 7 August 2025).

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## Peer Response

by [Julius Cloos](#) - Saturday, 9 August 2025, 9:35 AM

Hi Yosif,

Thank you for this detailed analysis of the ACM case study on Medical Implants. I found it very insightful, especially the way you elaborated on the fact that abiding by the current standards like the ones set by the United States Food and Drug Administration and the European Union's Medical Device Regulation can be insufficient as issues with the medical devices (such as the one presented in the case study regarding the initialization vector) can still lead to reputation loss. This is important, as reputation losses can lead to financial losses. This is known as Reputational Risk (Kenton, 2022).

To elaborate on your analysis, I would like to specifically point out some of the Principles of the ACM code that were fulfilled. For starters, Principle 1.1 was fulfilled as Corazón is developing medical implants beneficial to humans (ACM, 2025). Working with the regulatory organizations satisfies Principle 2.3 (ACM, 2025). Using strong, standard cryptographic protocols and a working vulnerability disclosure system satisfies Principles 2.6 and 2.9 (ACM, 2025). Considering the independent security researcher's results show adherence to Principle 2.5 (ACM, 2025).

Overall, this is a very insightful and relevant case study.

Thank you,

Julius Cloos

### References

ACM (2025) *Case Study: Medical Implant Risk Analysis*. Available at: <https://www.acm.org/code-of-ethics/case-studies/medical-implant-risk-analysis> (Accessed: 9 August 2025)

Kenton (2022) *Reputational Risk: Definition, Dangers, Causes, and Example*. Available at: <https://www.investopedia.com/terms/r/reputational-risk.asp> (Accessed: 9 August 2025)

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## Peer Response

by [Dalbir Singh](#) - Monday, 11 August 2025, 2:04 PM

Thank you for providing a thorough breakdown of the Medical Implant Risk Analysis case study, and I agree that Corazon's approach shows how technical diligence and professional ethics can work together to protect both patients and organisational reputation. I particularly appreciate your point that compliance with regulations like the FDA's medical device rules or the EU MDR is necessary but not sufficient, ethical responsibility often demands going beyond legal minimums.

Your mention of the company's transparency and engagement with the security community stood out. These actions align not only with ACM Principle 1.1 (contributing to society and human well-being) but also Principle 2.5 (giving thorough and fair evaluations of systems) and Principle 2.9 (designing secure systems) (ACM, n.d.). They also fit well with the BCS Code's emphasis on public interest and professional competence (BCS, 2022).

One dimension worth exploring further is **risk prioritisation**. While Corazon judged the vulnerability as "low risk," in medical contexts even low-probability threats can have severe consequences for patient safety. This raises a question: Should all identified vulnerabilities in life-critical systems be addressed immediately, regardless of assessed likelihood, or is a risk-based triage approach ethically acceptable if resources are limited?

Your post makes clear that public trust in medical devices depends on not only meeting regulatory standards but also demonstrating proactive, values-driven decision-making. In that respect, Corazon's continued bug bounty and openness to external scrutiny are important models for the industry.

### References

- ACM (n.d.) *Case Study: Medical Implant Risk Analysis*. Available at: <https://www.acm.org/code-of-ethics/case-studies/medical-implant-risk-analysis> (Accessed: 11 August 2025).
- BCS (2022) *BCS Code of Conduct*. Available at: <https://www.bcs.org/media/2211/bcs-code-of-conduct.pdf> (Accessed: 11 August 2025).

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