

# **Y2K BEACON: An Intelligent Web-based Crisis Center for Disseminating Year 2000 Biomedical Equipment Compliance Information**

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## **ABSTRACT**

The goal of our Y2K BEACON project is to provide information and support services for organizations to help them determine what corrective actions, if any, are necessary to ensure the proper functioning of medical equipment throughout the set of computer date problems commonly known as the Year 2000 (or Y2K) problem. The web site is for hospitals, clinics, medical laboratories, nursing homes and other facilities that rely on medical equipment. This site is not just a database-backed web site; quite the contrary, it uses intelligent web crawlers, automatic filters and automatic composition and emailing systems to provide a comprehensive, technically-driven crisis center. While there are similar web sites available, our site is unique because it: (1) allows the organization to present a list of equipment for batch processing; (2) provides automatically compiled essays to answer posed questions; and, (3) email compliance updates back to the organizations where updates are specific to their equipment.

No one knows for sure how widespread the full problem will be. However, the Gartner Group says that more than 90% of physician practices are not aware of their Year 2000 problems. It is estimated that more than half the hospitals and clinics are not aware of their Year 2000 problems. The Senate Committee on the Year 2000 Technology Problem estimates about 6,000 hospitals, 800,000 doctors and 50,000 nursing homes are not yet prepared. At this late date, there is still work to do with respect to healthcare organizations. Last year on 1/21/98, the Deputy Secretary of the Department of Health and Human Services sent a letter to 4687 manufacturers of medical devices and scientific laboratory equipment requesting a report on the status and impact on product performance with respect to the "Year 2000" problem. At this time, 3865 of the 4687 (82%) manufacturers contacted have not yet responded.

While the problem also effects medical information systems, we are not nearly as worried

about them because methodologies for testing compliance are readily available. For example, they can simply advance the date on the computer system to December 1999 and let it advance into January 2000. Running all reports and programs and assessing the validity of the results is one way to measure compliance. While fixing such systems is costly and time-consuming, methodologies do exist.

What concerns us more are the microcontrollers embedded into equipment. In daily life, for example, such microcontrollers run elevators, security systems, air purification systems and a host of medical equipment. In these cases, recalling which items have microcontrollers and advancing their dates may not be possible at all. Identifying such systems and contacting the manufacturers may be the best course of action, but even for a small clinic this can involve hundreds of pieces of equipment over many manufacturers. During this era of cost concern in healthcare, hospitals and clinics lack the financial resources to hire people and conduct independent follow-ups. Yet, patients' lives may have to rely on this equipment.

There are a series of problems associated with the Year 2000 problem in medical equipment; these include: live rollover to Year 2000, retention of Year 2000 on power down, power-off rollover to Year 2000, ability to change Year 2000 date, day of week calculation, leap year problem, and roll-over to Year 2001. Our database contains compliance information for more than 12,000 models and 348 different types of equipment including pace makers and other equipment one would not assume would rely on a microcontroller. While no one knows for sure what the total impact of the problem will be with respect to health care, there is no doubt that strategically gathering and disseminating specific and applicable knowledge can save lives. Further, the technology used in our web site provides a good model of how technology can be used to construct effective crisis centers.