|  |
| --- |
| **Therac-25 for Treating Cancer**  ***Therac-25: A computer controlled medical linear accelerator for treating cancer***  Normally, when a patient is scheduled to have radiation therapy for cancer, he or she is scheduled for several sessions over a few weeks and told to expect some minor skin discomfort from the treatment. The discomfort is described as being like a mild sunburn over the treated area.  Therac-25 was a new generation machine that incorporated the most recent computer control equipment. The machine targeted electron or[X-ray beams](http://computingcases.org/case_materials/therac/teaching/therac/supporting_docs/Therac%20Glossary.html#tr19) on cancerous tissue to destroy it. Electron beams were used to treat shallow tissue, while X-ray beams could penetrate with minimal damage to treat deep tissue.  When a doctor decides that a patient needs radiation therapy, that patient is given a prescription that indicates to the medical linear accelerator operator how many rads (radiation absorbed dose) the patient should receive over how many total treatments. In addition, the prescription indicates the location where the radiation should be applied. The patient schedules a time (or times) to receive treatment.  Standard procedures then determine whether, on any particular appointment, the[operator](http://computingcases.org/case_materials/therac/teaching/therac/supporting_docs/Therac%20Glossary.html#tr14)is to set up the equipment for electron or X-ray beam treatment. The patient is asked to lie in the appropriate position on the treatment table and the table is rotated to place the diseased part of the patients' body in the path of, and at the appropriate distance from, the radiation beam. The operator then does whatever mechanical setup is required and leaves the room to program the treatment data into the machine. After doing this, the operator presses the button that actuates the treatment routine. The patient is then helped off the treatment table and ushered out. After the appropriate forms have been filled out, the next patient is admitted.  Therac-25’s computerization made this laborious process much easier for operators, and allowed them to spend minimal time in setting up the equipment. Operators were thus freed to spend more time talking with and helping the patient.  In addition to making setup easier, the computer also monitored the machine for safety. Previous machines had safety devices as a part of the hardware of the machine. Among other things, these safety devices kept the machine from delivering doses of radiation that were too high. So, with the advent of computer control, these hardware based safety mechanisms were transferred to the software. Hospitals were told that the Therac-25 medical linear accelerator had "so many safety mechanisms" that it was "virtually impossible" to overdose a patient. |
|  |