

B. Case Study

Read the following case study and answer the questions at the end.

Therac -25 Accident

After undergoing a lumpectomy to remove a malignant breast tumour, a 61-year-old woman was receiving follow-up radiation treatment to nearby lymph nodes on a Therac-25 at the Kennestone Regional Oncology Centre in Marietta.

On June 3, 1985, the patient was set up for a 10-MeV electron treatment to the clavicle area. When the machine turned on, she felt a “tremendous force of heat..... This red-hot sensation.” When the technician came in, the patient said, “You burned me. Although there were no marks on the patient at the time, the treatment area felt “warm to the touch”.

The patient went home, but shortly afterward she developed a reddening and swelling in the center of the treatment area. Her pain had increased to the point that her shoulder “froze” and she experienced spasms. She was admitted to West Paces Ferry Hospital in Atlanta, but her oncologists continued to send her to Kennestone for Therac-25 treatments.

About two weeks later, the physicist at Kennestone notices that the patient had a matching reddening on her back as though a burn had gone through her body, and the swollen area had begun to slough off layers of skin. Her shoulder was immobile, and she was apparently in great pain.

In March of 1986, AECL received a lawsuit from the patient listing the hospital, manufacturer, and service organization responsible for the machine. Investigators

pointed to the lack of a mechanism in AECL to follow up reports of suspected accidents.

The Kennestone physicist later estimated that she received one or two doses of radiation in the 15,000 to 20,000 rad (radiation absorbed dose) range. Typical single therapeutic doses are in the 200 rad range. Doses of 1,000 rads can be fatal if delivered to the whole body.

Eventually, the patient's breast had to be removed because of the radiation burns. She completely lost the use of her shoulder and her arm, and was in constant pain.

But the manufacturer and operators of the machine refused to believe that it could have been caused by the Therac -25. The treatment prescription printout feature was disabled at the time of the accident, so there was no hard copy of treatment data. The lawsuit was eventually settled out of court.

Questions:

- a) Who do you think are responsible for the accident?
Discuss.
- b) Knowing that the Therac-25 has software more responsible than the hardware in emitting the radiation; would you confirm that software is riskier than hardware? Give reasons.
- c) Are you satisfied with the way the case was settled out of court? Why?
- d) What learning can be learnt from the case study? Do you have any suggestions to minimize such accidents?