12/2/99 EVENT RODS CODE
DCD (SP04)
CC: P Larkins, OSP
Brian Smith, NMSS
R Blanton, ASPO

STATE OF OHIO
Ohio Department of Health
Bureau of Radiation of Protection
Dr. J. Nick Baird, M.D., Director of Health

Date:	From: M LIGHT
To: JIM LYNCH	Agency/Company: ODH/BRP
Company: NRC REG III	Phone Number: 614 752-8878
Fax Number: 630-515-1096	No. of Pages (Including this Cover):
Phone Number:	3

COMMENTS: KETTERING MED CENTER
REPORT ON GAMMA KNIFE FAILURE 9/29/99

35 E. CHESTNUT ST. * 7TH FLOOR * COLUMBUS, OH 43266 * 614-644-2727 * FAX 614-466-0381

SP-E-9

84

Kettering Medical Center

October 4, 1999

Mr. Roger Suppes
Ohio Department of Health
Bureau of Radiation Protection
246 N. High St.
P.O. Box 118
Columbus, OH 43266-0118

Dear Mr. Suppes:

On September 29, 1999 Kettering Medical Center experienced an equipment failure involving a piece of regulated equipment (a Leksell Gamma Knife). In accordance with 10 CFR 21.21 (as adopted by the State of Ohio) we are providing you with a report of that failure, our actions to correct it, and our evaluation of excess exposure to the patient and staff involved in the incident. A full report is attached to this letter. The salient points are summarized here.

- The table of the Gamma Knife jammed in the middle of a treatment series while the shielding jaws of the Gamma Knife were opened.
- The patient was removed safely from the room by the Gamma Knife team.
- The team determined the cause of the problem and fixed it.
- The patient's treatment was resumed and completed normally.
- No member of the Gamma Knife team was exposed to excessive radiation.
- Elekta, the company which markets the Gamma Knife, has been notified of the problem.

If you have any further questions or require additional information please call me at 937-296-7818 or e-mail me at steve.cartwright@ketthealth.com.

Sincerely,

Steven Cartwright, PhD, DABR
Radiation Safety Officer

Attach.

cc: Tom Daskalakis, Vice-president, Kettering Medical Center
Gerry Szkotnicki, Director, Wallace-Kettering Neuroscience Institute, KMC
Gary Kraus, MD, Director, Gamma Knife, KMC

3535 Southern Blvd.
Kettering, Ohio
45429

937-298-4331
Internet: www.ketthealth.com
Fax: 937-296-4226

On September 29, 1999, the Gamma Knife at Kettering Medical Center failed around 9:30 PM during a patient treatment. The treatment consisted of 22 individual "shots" from the Gamma Knife. In between each shot the patient couch retracts from the Gamma Knife and the shielding jaws close to contain the sources. After the completion of the 8th shot the table began to retract as normal but stopped when only part way out with the shielding jaws still opened. The Gamma Knife team (a neurosurgeon, a radiation oncologist, a nurse, two physicists, and a radiation therapist) began the proper sequence of emergency procedures. All attempts to move the table failed, so the team entered the room. Attempts to move the table by hand also failed. The patient was released from the Gamma Knife and escorted from the room, followed by the Gamma Knife team. The team members were finally able to use the controls to get the table to retract fully, allowing the shielding jaws to close. The team estimates they were in the room with the jaws opened for less than two minutes.

Once the shielding jaws were closed the team reentered the room and examined the table. They discovered that a microphone jack had come loose and fallen in between the moving couch and its rail. Attempts to dislodge the jack failed, so the lead physicist stayed in the room in a shielded area while the couch was moved back into treatment position with the jaws opened. She was able to reach around the Gamma Knife and pull out the jack by hand. Once the jaws were closed again the team determined that the jack, though crushed, was still operational and could be reinserted. After several trial runs to ensure proper table motion the patient's treatment went forward and was completed without further incident.

The next morning the Radiation Safety Office staff and the lead physicist made dose rate measurements around the Gamma Knife so as to reconstruct the dose to all those involved in the incident. Their film badges were sent to Landauer, Inc. for immediate readings. The dose estimates and badge readings for the team members are shown below. The radiotherapist did not enter the room, so her badge reading is not presented here.

Person	Estimated dose	Badge reading
Patient	0.2 cGy (to the skull)	-
Neurosurgeon	0.002 cGy	M
Radiation Oncologist	0.0008 cGy	M
Nurse	0.002 cGy	M
Physicist	0.000046 (whole body)	M
Physicist	0.006 cGy (whole body)	M
	0.8 cGy (right hand)	3.8 mSv

"M" stands for minimal dose. The ring badge reading for the physicist is primarily from her activities with prostate seed implants. The patient's excess dose is only a small fraction of the total planned dose, so there was no misadministration.

Elekta, Inc., the distributor of the Gamma Knife, was informed of the mishap. They will send a replacement jack and possibly a service person to inspect the machine before the next treatment, scheduled for October 11, 1999. They acknowledged that this kind of accident can happen.