

Summary of Linear Accelerator Questionnaire

Fall 2011

Executive Summary

The linear accelerator questionnaire was developed due to the lack of statewide information relating to how the providers used the equipment and maintained their business operations. The only information available was from national surveys. With the number of linear accelerator applications increasing and more contradicting information being reported, it was determined that a statewide survey of radiation therapy providers needed to be conducted.

The linear accelerator questionnaire was developed to capture the general business information that was lacking for our state along with some general information relating to the linear accelerator usage. The general business information collected ranged from normal business hours to how much down time a provider experienced during a normal day. The general usage information helped show what types of treatments (e.g. EBRT and IMRT) were being conducted and how long they took.

A list of questions was developed that highlighted the areas which had conflicting information along with clarifying information relating to the various types of treatments. This was also an opportunity for information about some new technologies to be shared. Once the questionnaire was developed and formatted, it was distributed to all providers who utilize linear accelerators via the contacts for the Medical Equipment Registry. These contacts were CEO's, strategic planners, or imaging directors of these health care providers. These contacts then relied on their cancer center directors or radiation oncologists to answer the questions. Within a few weeks, 42 out of 49 providers responded.

The responses were read and tabulated by HSDA staff. Follow-up calls and/or emails were made for clarification purposes. The highlights of the results are as follows:

- Most cancer treatment centers operate 42.5 hours a week (5 days a week) instead of the traditional 48 hour week; however, these same centers frequently open early or close later to accommodate additional or complex patients.
- The main types of treatments on linear accelerators are EBRT and IMRT.
- SRS and Rapid Arc/VMAT are done on specialized, multi-tasking units in smaller quantities compared to EBRT and IMRT.
- Statewide, EBRT constitutes about 62% of all treatments administered while IMRT is about 38%.
- EBRT has an average of about 14 minutes while IMRT has an average of about 21 minutes.
- Projections are that both EBRT and IMRT treatment times will decline over the next few years with the advancements in technology.

The pages that follow include more detailed results of the survey including definitions and the last page is a copy of the survey instrument (linear accelerator questionnaire).

Summary of Linear Accelerator Questionnaire

Based on Respondents Received by 10/3/2011

Received 42 out of 49 providers (85.71%)

Business Hours:

Earliest start time: 6:30am

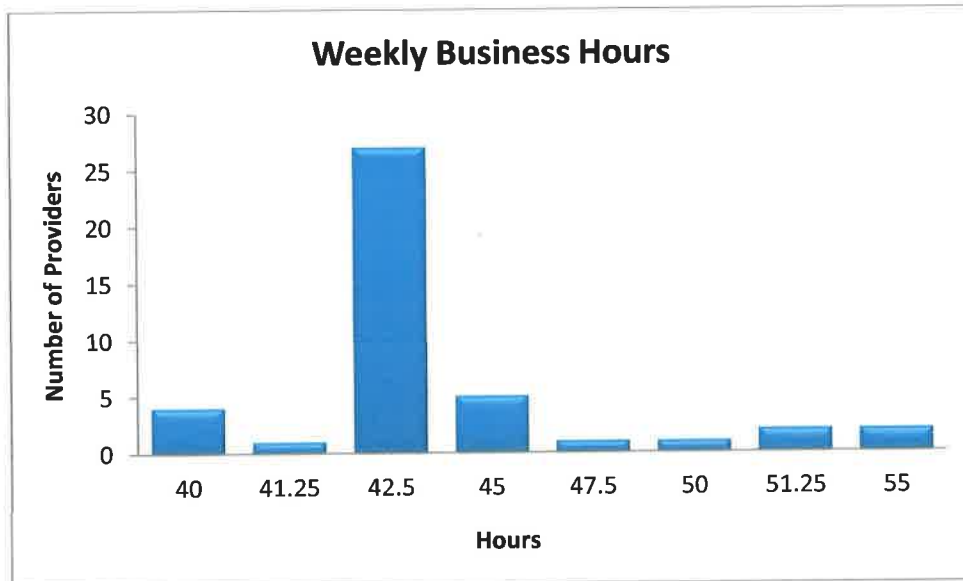
Latest Open: 6pm

Most Frequent Span: 8am – 4:30pm (48.8%)

Weekly Hours Open:

Range: 40 hours to 55 hours

Most Frequent: 42.5 hours (62.8%)



Down Time per Day:

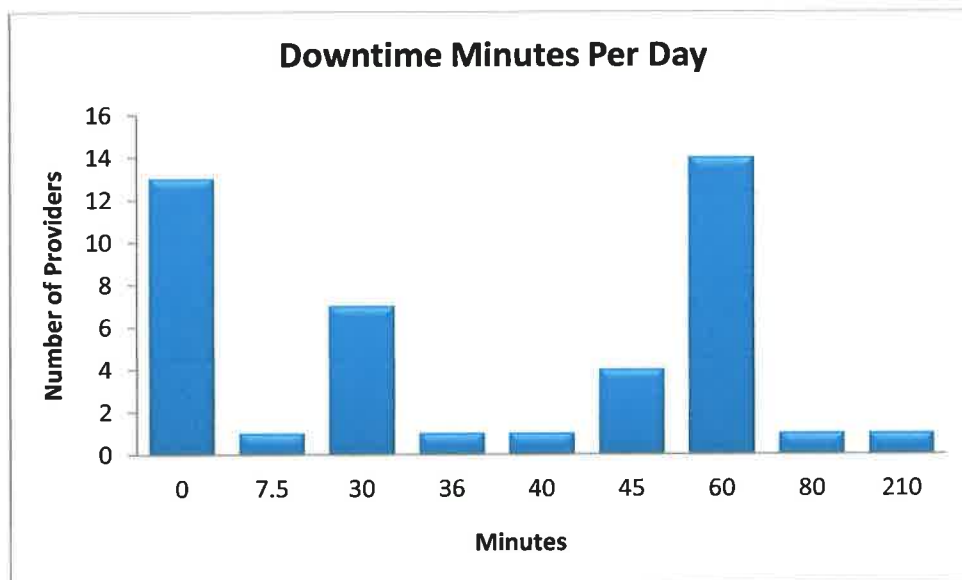
(The time during normal business hours in which patients are not receiving treatments due to quality assurance checks, warm up time, maintenance, or other non-treatment procedures.)

Other than No Down Time, the Range of Time per Day: (2 hours/quarter) to 3.5 Hours

Never Having Down Time: 27.9%

Most Frequent: 1 Hour (32.6%)

In some cases, the hour was the time set aside for lunch.



External Beam Radiation Therapy (EBRT):

Scheduled Time:

(Definition: The standard allocated time assigned to a patient to receive radiation treatment. The allocated time may differ for each type of treatment.)

Range: 10 minutes to 20 minutes

Most Frequent: 15 minutes (83.3%)

Average Scheduled Time: 15.24 minutes

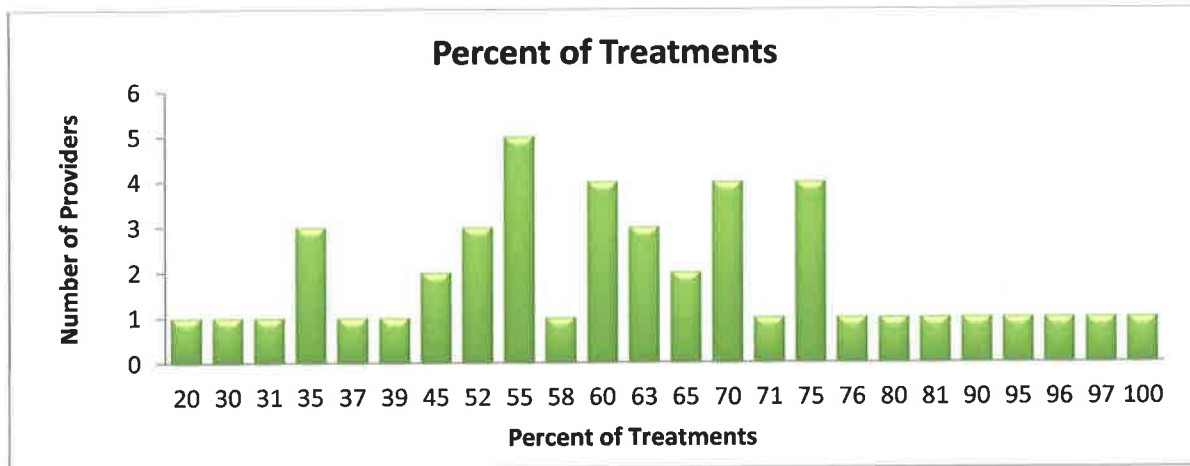


Percent of Total Treatments (of all Types)

Range: 20% to 97%

Average: 61.93%

Most Frequent Percent: 55%



Turnaround Time:

(Definition: The actual time from which the patient enters the linear accelerator vault for a treatment to when the patient leaves the vault after a treatment. This does include the treatment time itself.)

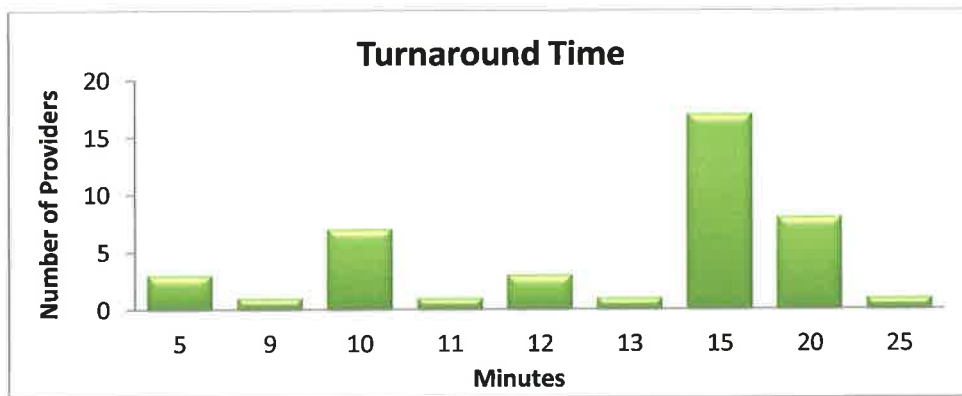
(If a range was given, the maximum is what's used in calculations.)

Range: 5 minutes to 25 minutes

Most Frequent: 15 minutes (40.5%)

Average Turnaround Time (using higher frequency of reported times): 15.16 minutes

Average Turnaround Time (all reported times): 14.14 minutes



Projecting Turnaround Time in Five Years

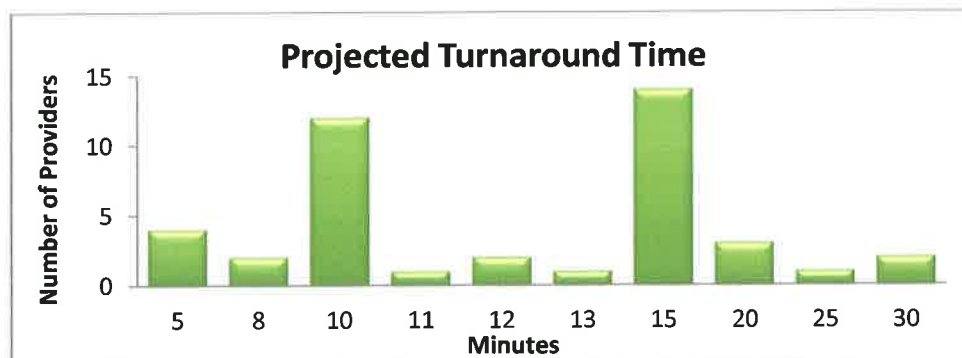
(If a range was given, the maximum is what's used in calculations.)

Range: 5 minutes to 30 minutes

Most Frequent: 15 minutes (33.33%)

Average Turnaround Time (using higher frequency of reported times): 12.69 minutes

Average Turnaround Time (all reported times): 13.31 minutes



Intensity Modulated Radiation Therapy (IMRT):

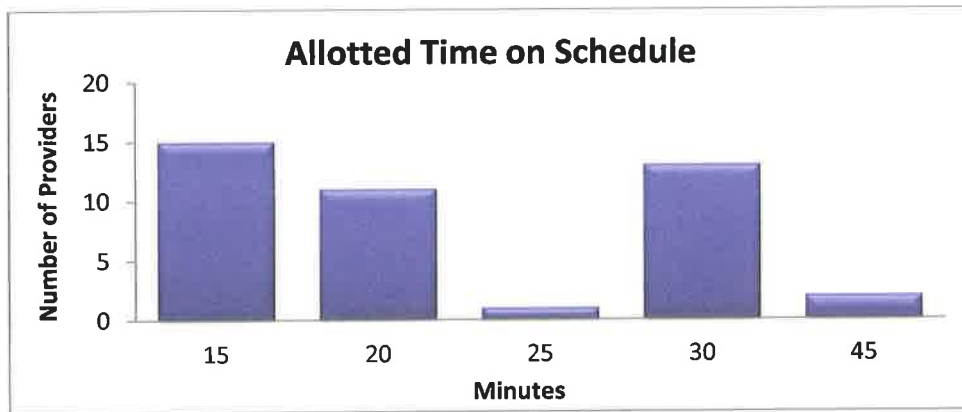
Scheduled Time:

(Definition: The standard allocated time assigned to a patient to receive radiation treatment. The allocated time may differ for each type of treatment.)

Range: 15 minutes to 45 minutes

Most Frequent: 15, 20, and 30 minutes (35.7%, 26.2%, and 30.9% respectively)

Average Scheduled Time: 21.19 minutes

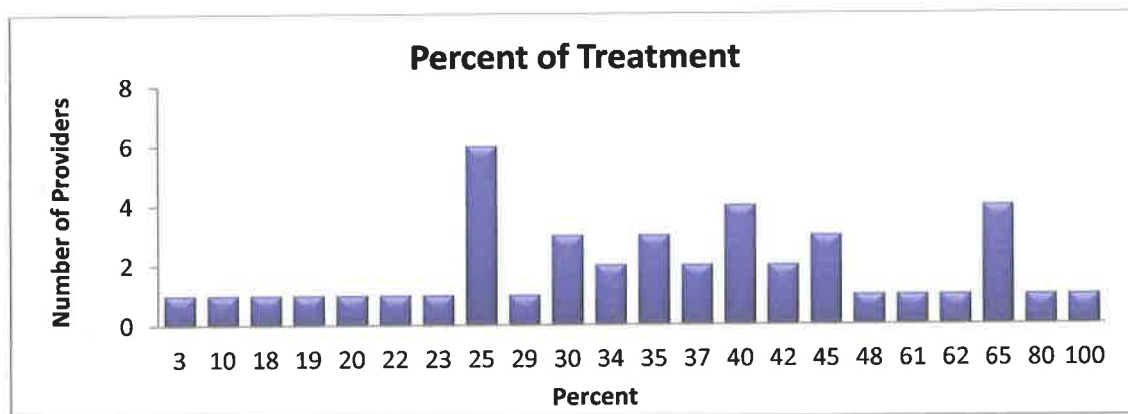


Percent of Total Treatments (of all Types)

Range: 3% to 80%

Average: 38.60%

Most Frequent Percent: 25%



Turnaround Time:

(Definition: The actual time from which the patient enters the linear accelerator vault for a treatment to when the patient leaves the vault after a treatment. This does include the treatment time itself.)

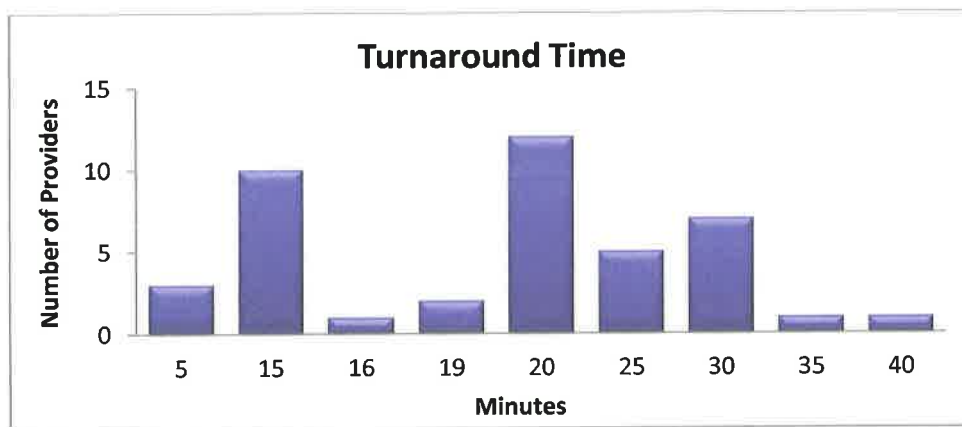
(If a range was given, the maximum is what's used in calculations.)

Range: 5 minutes to 40 minutes

Most Frequent: 15 and 20 minutes (23.8% and 28.6% respectively)

Average Turnaround Time (using higher frequency of reported times): 17.73 minutes

Average Turnaround Time (all reported times): 20.69 minutes



Projected Turnaround Time in Five Years

(If a range was given, the maximum is what's used in calculations.)

Range: 5 minutes to 45 minutes

Most Frequent: 15 minutes (50%)

Average Turnaround Time (all reported times): 17.62 minutes

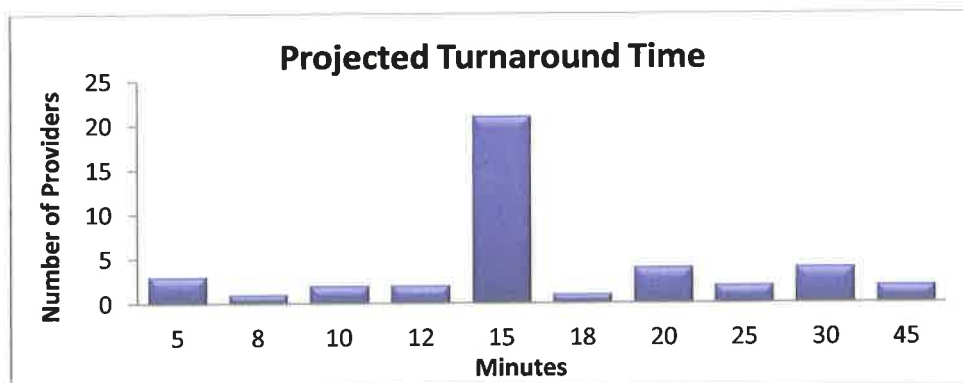


Image-Guided Radiation Therapy (IGRT)

It has been noted by many providers that this type of treatment is done in conjunction with all the other treatments. If it is done separately, it is done prior to the actual treatment.

Rapid Arc/Volumetric Modulated Arc Therapy (VMAT):

It has been determined that these are similar treatments depending on the equipment's maker (e.g. Varian or Elekta).

Scheduled Time:

(Definition: The standard allocated time assigned to a patient to receive radiation treatment. The allocated time may differ for each type of treatment.)

Range: 15 minutes

Percent of Total Treatments (of all Types)

Range: 2% to 5%

Average: 3.75%

Most Frequent Percent: 5%

Turnaround Time:

(Definition: The actual time from which the patient enters the linear accelerator vault for a treatment to when the patient leaves the vault after a treatment. This does include the treatment time itself.)

Range: 15 minutes to 20 minutes

Most Frequent: 15 minutes (75%)

Average Turnaround Time (all reported times): 16.25 minutes

Stereotactic Radiosurgery (SRS)/Cyberknife

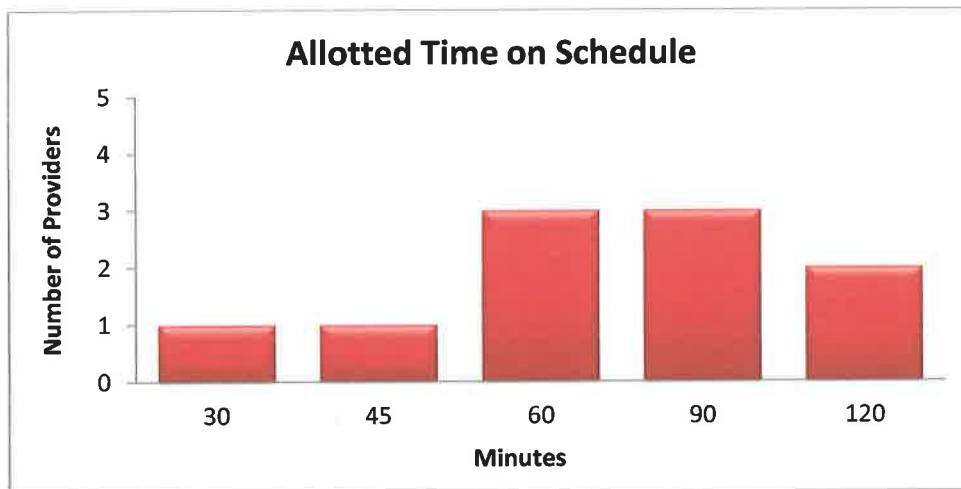
Scheduled Time:

(Definition: The standard allocated time assigned to a patient to receive radiation treatment. The allocated time may differ for each type of treatment.)

Range: 30 minutes to 120 minutes (2 hours)

Most Frequent: 60 and 90 minutes (30.% each)

Average Time: 76.5 minutes

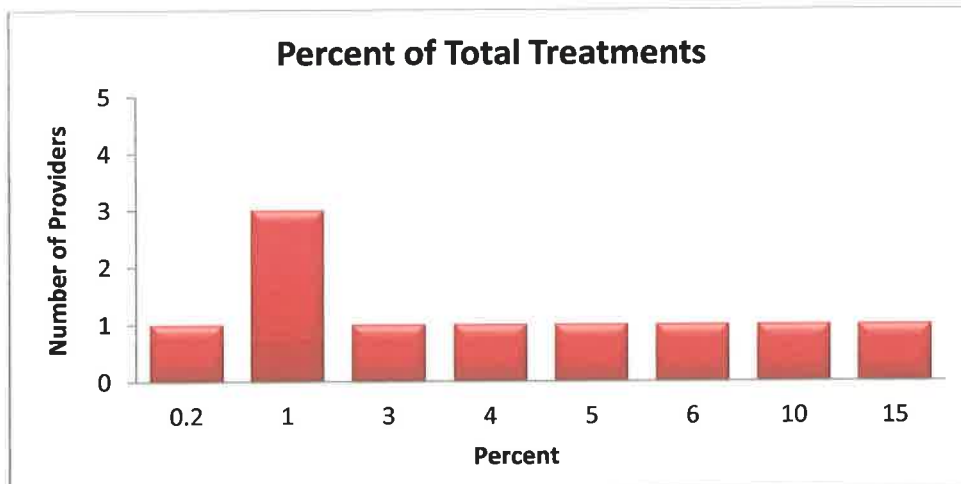


Percent of Total Treatments (of all Types)

Range: 0.2% to 15%

Average: 4.62%

Most Frequent Percent: 1%



Turnaround Time:

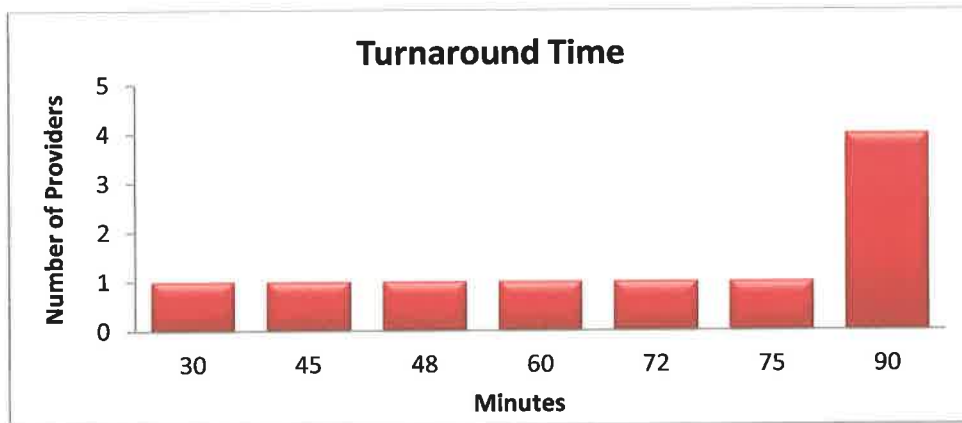
(Definition: The actual time from which the patient enters the linear accelerator vault for a treatment to when the patient leaves the vault after a treatment. This does include the treatment time itself.)

(If a range was given, the maximum is what's used in calculations.)

Range: 30 minutes to 90 minutes

Most Frequent: 90 minutes (40%)

Average Turnaround Time (all reported times): 69 minutes



Projected Turnaround Time in Five Years

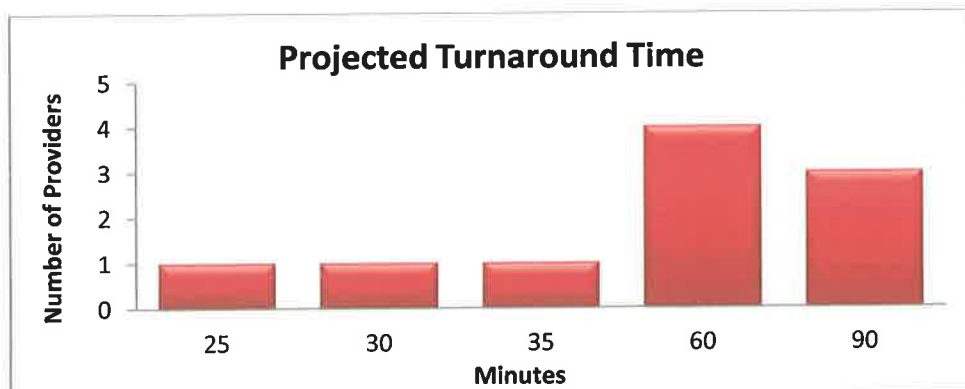
(If a range was given, the maximum is what's used in calculations.)

Range: 25 minutes to 90 minutes

Most Frequent: 60 minutes (40%)

Average Turnaround Time (using higher frequency of reported times): 72.86 minutes

Average Turnaround Time (all reported times): 60 minutes



Name of Facility: _____

What is the normal business hours for radiation treatments? (e. g. Monday-Friday 8am-4pm) _____

Have you opened early and/or stayed open late to meet the additional patients' needs? (Yes or No) _____

If yes, how many times has this occurred during the past 12 months? _____

How much time during the reported normal business hours is reserved for quality assurance checks, warm up time, maintenance, or other non-treatment procedures when patients are not being treated? _____

Treatment Types	Do one or all of your linear accelerators have this capability?		What is the length of scheduled time allotted for this type of treatment? (In Minutes)	Of the total treatments, what is the percent for this type of treatment? (Past 12 months)	*What is the current average turnaround time?	*What do you foresee the average turnaround time will be in 5 years?
	Yes/No	If Yes, how many?				
External Beam Therapy						
IMRT						
IGRT						
RapidArc						
VMAT						
SRS						
Other (Please Specify Below)						
Total				100%		

*Turnaround Time = The time from which the patient enters the linear accelerator vault for a treatment to when the patient leaves the vault after a treatment.
This does include the treatment time itself.

Comments (related to any above question): _____