SELF-REFERRAL SCREENING

2013 CT ANNUAL REPORT

Registrants approved by Minnesota Department of Health (MDH) to perform Computed Tomography (CT) Cardiac, Lung, and/or Colon self-referral screening annually provide the following data within this report. Individuals are encouraged to use this data for developing new self-referral screening programs or reviewing current screening practices relative to patient exposures and ALARA principles.
SELF-REFERRAL SCREENING PROGRAM

BACKGROUND INFORMATION

If an individual wishes to have an examination not ordered by a licensed practitioner of the healing arts, MDH regulates the program designed and equipment used to detect or evaluate specific health conditions. An application and approval from the Commissioner is required before these examinations can be performed. The regulations governing self-referral screening are contained in the Ionizing Radiation Rules, Chapter 4732.

When a patient chooses to be screened without consulting a licensed practitioner of the healing arts, it is particularly important to protect individuals from unnecessary radiation exposure resulting from CT self-referral screening examinations. The registrant must provide MDH with nationally recognized standards or copy of site specific guidelines and criteria the organization follows for each area performing CT self-referral screening. MDH reviews the determinants used for selection of patients to be screened.

Every reasonable effort should be made to maintain radiation exposures as low as is reasonably achievable (ALARA). The registrant should consider the ALARA philosophy in the development of work plans involving the procedure and protocol used for CT self-referral screening examinations.

Registrants must provide assurance that the operator, patient, and member of the public are not receiving unnecessary radiation exposure by testing equipment at regular intervals. Equipment Performance Evaluations (EPE) are required at intervals not to exceed 12 months because of the complexity and higher output of these units. The only individuals authorized to assess the performance measurements on CT scanners performing CT self-referral screening are diagnostic radiologic physicists.

The registrant must submit as part of the screening application, the calculation of each screening study using the CTDI-vol output value from each CT unit performing self-referral screening examinations. The CTDI-vol output values are based on the factors programmed within the scanner.

ANNUALLY REQUESTED DATA:

- Number of CT self-referred patients screened for each type of examination per calendar year
- Number of positive results for each type of screening examination
- Type of scanner used in performing these examinations by detector configuration (slice)
- Average total dose length product given to the patient in mGy-cm for each detector configuration (slice)
Registrants approved by MDH to perform CT self-referral screening receive an annual questionnaire in January to collect data regarding self-referral screenings performed the previous year. The major components of this questionnaire include the number of CT self-referred patients screened for each type of examination, number of positive results for each type of screening examination, type of scanner used in performing these examinations by detector configuration (slice), actual CTDI-vol in mGy calculated from factors programmed in CT scanner, and average total dose length product given to the patient in mGy-cm for each detector configuration (slice).

**Number of CT self-referred patients screened for each type of examination**

Minnesota had a total of 42 approved screening locations in 2013. Of the 42 self-referral screening locations; 33 were approved for Cardiac, 28 were approved for Lung, and 14 were approved for Colon. Data collected from all approved self-referred screening locations indicated a combined total of 1,856 examinations for all screening areas.

Cardiac CT self-referred screening was identified as the predominant examination in Minnesota. Total CT self-referral screening examinations performed in 2013 was 1,856; 1,824 of the exams were Cardiac, 23 of the exams were Lung, and 9 of the exams were Colon. The data is represented in the graph below.

![Graph showing the distribution of self-referral screenings in Minnesota.](image)

**Number of positive results for each type of screening examination**

The annual questionnaire requests the number of examinations that were interpreted with a positive finding for each area approved, i.e. Cardiac, Lung, and Colon. The registrant determines the extent to which an examination is considered positive.
Data analysis of the 1,824 Cardiac self-referral examinations indicated 985 with a positive finding. The chart to the right is a graphical representation of the data.

**Cardiac Self-Referral Screening**

- Positive results 54%
- Negative results 46%

Data analysis of the 23 Lung self-referral examinations indicated 9 with a positive finding. The chart to the left is a graphical representation of the data.

**Lung Self-Referral Screening**

- Positive results 39%
- Negative results 61%

Data analysis reported of the 9 Colon self-referral examinations indicated 4 with a positive finding. The chart to the right is a graphical representation of the data.

**Colon Self-Referral Screening**

- Positive results 44%
- Negative results 56%
Scanner, CTDI-vol (mGy), & Dose Length Product

The annual questionnaire requests the manufacturer of the primary unit performing CT self-referral screening by detector configuration (slice). The registrant will also indicate if the primary unit uses dose reduction software for the programmed self-referral screening protocol and/or gating capabilities.

The survey requests the average dose length product given to the patient in mGy-cm for each detector configuration (slice). As a part of the annual application, self-referral screening applicants are required to submit an actual CTDI-vol in mGy calculated from factors programmed in CT scanner. All data represented below are averaged.

CARDIAC

Of 42 approved screening locations, 30 scanners actively performing Cardiac self-referral screening.

- 12 Siemen scanners – 12 use dose reduction software
  - 2 Siemens 16 include gating
  - 2 Siemens 64 include gating
  - 4 Siemens 128 include gating
  - 1 Siemens 320 include gating

- 16 GE scanners – 11 use dose reduction software
  - 4 GE 16 include gating
  - 2 GE 64 include gating

- 1 Philip scanner – 1 use dose reduction software and gating

- 1 Toshiba scanner – 1 use dose reduction software and gating

### Cardiac Siemens CTDI-vol

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<th>Min CTDI-vol</th>
<th>Average CTDI-vol</th>
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### Cardiac Siemens DLP

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Of 42 approved screening locations, 16 scanners actively performing Lung self-referral screening.

- 5 Siemens scanners – 5 use dose reduction software
- 11 GE scanners – 7 use dose reduction software
Of 42 approved screening locations, 4 scanners actively performing Colon self-referral screening.

- 1 Siemens scanner – 1 use dose reduction software
- 3 GE scanners – 2 use dose reduction software

*The Colon DLP is reported combining both supine and prone imaging.*