

NATIONAL QUALITY FORUM

Measure Evaluation 4.1 January 2010

This form contains the measure information submitted by stewards. Blank fields indicate no information was provided. Attachments also may have been submitted and are provided to reviewers. The sub-criteria and most of the footnotes from the [evaluation criteria](#) are provided in Word comments and will appear if your cursor is over the highlighted area (or in the margin if your Word program is set to show revisions in balloons). Hyperlinks to the evaluation criteria and ratings are provided in each section.

TAP/Workgroup (if utilized): Complete all **yellow highlighted** areas of the form. Evaluate the extent to which each sub-criterion is met. Based on your evaluation, summarize the strengths and weaknesses in each section.

Note: *If there is no TAP or workgroup, the SC also evaluates the sub-criteria (yellow highlighted areas).*

Steering Committee: Complete all **pink** highlighted areas of the form. Review the workgroup/TAP assessment of the sub-criterion, noting any areas of disagreement; then evaluate the extent to which each major criterion is met; and finally, indicate your recommendation for the endorsement. Provide the rationale for your ratings.

Evaluation ratings of the extent to which the criteria are met

C = Completely (unquestionably demonstrated to meet the criterion)

P = Partially (demonstrated to partially meet the criterion)

M = Minimally (addressed BUT demonstrated to only minimally meet the criterion)

N = Not at all (NOT addressed; OR incorrectly addressed; OR demonstrated to NOT meet the criterion)

NA = Not applicable (only an option for a few sub-criteria as indicated)

(for NQF staff use) NQF Review #: PSM-043-10	NQF Project: Patient Safety Measures
MEASURE DESCRIPTIVE INFORMATION	
De.1 Measure Title: Participation in a Systematic National Dose Index Registry	
De.2 Brief description of measure: Participation in a multi-center, standardized data collection and feedback program that will establish national dose index benchmarks for designated examinations. The registry will eventually provide a comparison of practice or facility dose indices such as CTDIvol and DLP for specified examinations relative to national and regional benchmarks. Data is captured electronically from the images of CT examinations using Digital Imaging and Communications in Medicine (DICOM) standards and the Integrating the Healthcare Enterprise (IHE) Radiation Exposure Monitoring (REM) profile.	
1.1-2 Type of Measure: structure/management	
De.3 If included in a composite or paired with another measure, please identify composite or paired measure	
De.4 National Priority Partners Priority Area: population health, safety	
De.5 IOM Quality Domain: safety, efficiency	
De.6 Consumer Care Need: Staying Healthy	

CONDITIONS FOR CONSIDERATION BY NQF	
Four conditions must be met before proposed measures may be considered and evaluated for suitability as voluntary consensus standards:	NQF Staff
A. The measure is in the public domain or an intellectual property (measure steward agreement) is signed. <i>Public domain only applies to governmental organizations. All non-government organizations must sign a measure steward agreement even if measures are made publicly and freely available.</i>	A Y <input type="checkbox"/> N <input type="checkbox"/>
A.1 Do you attest that the measure steward holds intellectual property rights to the measure and the right to use aspects of the measure owned by another entity (e.g., risk model, code set)? Yes	
A.2 Indicate if Proprietary Measure (as defined in measure steward agreement):	

A.3 Measure Steward Agreement: agreement signed and submitted	
A.4 Measure Steward Agreement attached: Measure Steward Agreement_ACR.pdf	
B. The measure owner/steward verifies there is an identified responsible entity and process to maintain and update the measure on a schedule that is commensurate with the rate of clinical innovation, but at least every 3 years. Yes, information provided in contact section	B Y <input type="checkbox"/> N <input type="checkbox"/>
C. The intended use of the measure includes <u>both</u> public reporting <u>and</u> quality improvement. ► Purpose: public reporting, quality improvement Payment Incentive, Accountability	C Y <input type="checkbox"/> N <input type="checkbox"/>
D. The requested measure submission information is complete. Generally, measures should be fully developed and tested so that all the evaluation criteria have been addressed and information needed to evaluate the measure is provided. Measures that have not been tested are only potentially eligible for a time-limited endorsement and in that case, measure owners must verify that testing will be completed within 12 months of endorsement. D.1 Testing: No, testing will be completed within 12 months D.2 Have NQF-endorsed measures been reviewed to identify if there are similar or related measures? Yes	D Y <input type="checkbox"/> N <input type="checkbox"/>
(for NQF staff use) Have all conditions for consideration been met? Staff Notes to Steward (<i>if submission returned</i>):	Met Y <input type="checkbox"/> N <input type="checkbox"/>
Staff Notes to Reviewers (<i>issues or questions regarding any criteria</i>):	
Staff Reviewer Name(s):	

TAP/Workgroup Reviewer Name:	
Steering Committee Reviewer Name:	
1. IMPORTANCE TO MEASURE AND REPORT	
Extent to which the specific measure focus is important to making significant gains in health care quality (safety, timeliness, effectiveness, efficiency, equity, patient-centeredness) and improving health outcomes for a specific high impact aspect of healthcare where there is variation in or overall poor performance. <i>Measures must be judged to be important to measure and report in order to be evaluated against the remaining criteria. (evaluation criteria)</i> 1a. High Impact	Eval Rating
(for NQF staff use) Specific NPP goal :	
1a.1 Demonstrated High Impact Aspect of Healthcare: frequently performed procedure, high resource use, patient/societal consequences of poor quality 1a.2 1a.3 Summary of Evidence of High Impact: Ionizing radiation has been used for diagnostic purposes in medicine for more than a century. The benefits are immense and certainly exceed the risks. The more recent development of equipment such as multi-detector row computed tomography and the increased utilization of x-ray and nuclear medicine imaging studies have improved the lives of our patients and, along with other new modalities, revolutionized the practice of medicine. However, this dramatic evolution of imaging has also resulted in a significant increase in the population's cumulative exposure to ionizing radiation. Over the past quarter century, there has been a rapid growth in both the number of diagnostic x-ray examinations and the introduction of newer, very valuable, but also relatively high-dose technologies. Use of Computed Tomography (CT) has risen considerably over the past several decades; in the past 10 years use of CT has increased nearly 700% (3,4). The total number of CT examinations performed annually in the United States has risen from approximately 3 million in 1980 to nearly 70 million in 2007. (1, 2) Additionally, radiation exposure from CT examinations has also increased, in part due to the increased speed of image acquisition allowing vascular, cardiac and multiphase examination, all associated with	1a C <input type="checkbox"/> P <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/>

higher doses. Thus, greater use of CT has resulted in a concurrent increase in the medical exposure to ionizing radiation. (5)

This dramatic evolution of imaging has also resulted in a significant increase in the population's cumulative exposure to ionizing radiation. (1) Although there is current debate that this will cause an increased incidence of cancer years down the line, the presumption is that it will.

It is worth noting that many (CT) scans and nuclear medicine studies have effective dose estimates in the range of 10 to 25 mSv for a single study, and some patients have multiple studies; thus, it would not be uncommon for a patient's estimated exposure to exceed 50 mSv. In further validation of this concern, the International Commission on Radiological Protection has reported that CT doses can indeed approach or exceed levels that have been shown to result in an increase in cancer (1). CT exams account for about 5-15% of imaging exams using ionizing radiation but estimated to contribute 70% of effective radiation dose from all medical imaging [6].

1a.4 Citations for Evidence of High Impact: Citations for Evidence of High Impact

1. Amis Es Jr, Butler PF, Applegate KE, et al; American College of Radiology. American College of Radiology white paper on radiation dose in medicine J AM Coll Radiol. 2007;4(5):272-284.
2. IMV Medical Information Division. CT Census Database and Market Summary Report. Greenbelt, MD: IMV;2008.
3. Medicare payment Advisory Commission. A Data Book: Healthcare Spending and the Medicare Program. June 2007. http://www.medpac.gov/documents/Jun08DataBook_Entire_report.pdf. Accessed January 29, 2010.
4. Radiation Risks and Pediatric Computed Tomography (CT): A Guide for Health Care Providers - from NCI and SPR. www.nci.nih.gov/cancertopics/causes/radiation-risks-pediatric-CT.
5. Bindman-Smith R, Lipson J, Marcus R, et al. Radiation Dose Associated with Common Computed Tomography Examinations and the Associated Lifetime Attributable Risk of Cancer. Arch Intern Med 2009; 169 (22)2078-2085.
6. Brody AS, Frush DP, Huda W, et al. Radiation risk to children from computed tomography. Pediatrics 2007; 120:677-682.

1b. Opportunity for Improvement

1b.1 Benefits (improvements in quality) envisioned by use of this measure: Dose Absorption

The determination of ionizing radiation dose to a living human is very complex and poses many challenges for referring physicians, radiologists, radiologic technologists, medical physicists, equipment vendors, regulators, and patients. To determine the absorbed radiation dose, the initial x-ray beam exposure and the absorption in each organ must be known. It is the latter quantity that complicates this determination. This absorption is dependent on the amount and properties of each tissue encountered by the x-ray beam, and these parameters vary widely among patients. The situation is further complicated because it is not practical to insert radiation detectors into each organ of every patient. It is important to understand that the reported numerical values for individual radiation doses may vary by factors of 5 to 10 depending on individual patients and the manner of image acquisition.

Effective Dose

Although there is little doubt that the absorbed radiation dose for an abdominal CT examination is larger than that for a radiograph of the ankle, the precise numeric quantity (particularly for an individual) is quite problematic. (1) The American College of Radiology has adopted a policy of expressing quantitative values

1b
 C
 P
 M
 N

regarding radiation dose as “dose estimates.” Effective dose is an estimate of radiation dose to the “whole body” that allows different sources of ionizing radiation and different regions of the body to be compared. To date, relatively few data describe how much radiation is received through the most common types of CT examinations when applied in clinical practice, as most published studies focused on phantom studies. (2)

However, with the growing applications of digital imaging, such data can now more easily be acquired. Digital x-ray imaging systems, such as computed radiography (CR), digital radiography (DR), and CT provide an index related to the amount of radiation that was generated to form an image. Currently, these quantities are either displayed at the scanner operator’s console or embedded with the image itself.

A central database established for collecting dose indices as a function of patient qualities (i.e., gender, age, size, etc.) and exam type (i.e., lateral lumbar spine, pelvis CT, etc.), would allow the relative range of radiation doses to be analyzed. Such a database would be valuable in its ability to demonstrate changes in dose indices due to technological advances and practice modifications and would be useful to advisory radiation safety bodies as well as to individual practices wishing to compare their own doses against established benchmarks. The ACR’s dose index registry has been implemented to serve this purpose.

1. Amis Es Jr, Butler PF, Applegate KE, et al; American College of Radiology. American College of Radiology white paper on radiation dose in medicine J AM Coll Radiol. 2007;4(5):272-284.

2. Bindman-Smith R, Lipson J, Marcus R, et al. Radiation Dose Associated with Common Computed Tomography Examinations and the Associated Lifetime Attributable Risk of Cancer. Arch Intern Med 2009; 169 (22)2078-2085.

1b.2 Summary of data demonstrating performance gap (variation or overall poor performance) across providers:

The recent safety investigation by the FDA (1) of “radiation overexposures during perfusion computed tomography (CT) imaging to aid in the diagnosis and treatment of stroke” highlights the importance of carefully evaluating protocols for all CT procedures relative to both radiation dose and image quality.

The process of establishing a set of scan acquisition parameters (generally referred to as a scan ‘protocol’) has become much more demanding in recent years because the available options have greatly expanded, and various CT scanner manufacturers have adopted slightly different implementations. Ideally, each CT scan protocol would be designed to just meet the image quality need for the examination to be conducted on each patient, using the appropriate dose level. The lead radiologist, lead CT technologist, and qualified medical physicist should optimally converge to design and review all new or modified protocol settings, with the goal to ensure that both image quality and radiation dose aspects are appropriate. Additionally, a regular review process should be implemented to consider all protocols on a recurring basis to be sure that no unintended changes have been inadvertently applied that may degrade image quality or unreasonably increase dose.

Due to the complexity of modern CT scanners, there is a plethora of parameter setting combinations possible on each scanner model. The specific set to be used for any single exam is up to the supervising physician to determine. As a general guideline, the ACR has established dose reference levels (2) for three common CT exams:

Adult brain or head:	CTDIvol 75 mGy
Adult abdomen:	CTDIvol 25 mGy
Pediatric abdomen (5yo):	CTDIvol 20 mGy

The ACR CT Accreditation program has gathered credible data on the range of radiation exposure factors associated with various CT examinations and therefore is able to define good practice regarding radiation exposure [3]. The ACR recently implemented maximum radiation dose estimate pass/fail criteria for its CT Accreditation Program, based on data from 2002 to 2004 that showed average Accreditation Program doses by sites applying for ACR CT accreditation decreased by 12.1, 3.2, and 1.7 mGy (20.1, 12.8, and 4.9% of the reference values) for head, pediatric, and body exams, respectively. (4) Since the inception of the ACR

Accreditation program, a consistent lowering of average U.S. CT doses for head, body, and pediatric body exams has been observed.

Phantom vs Clinical Image Reference Levels

However, the reference levels used in the CT Accreditation program and identified in the ACR Practice Guideline for Diagnostic Reference Levels in Medical X-Ray Imaging (2) are based on dose indices obtained using standard phantom images rather than clinical images. The existing reference levels are not based on dose estimates from actual patients. The ACR Dose Index Registry will enable development of patient-based reference levels which can be used for benchmarks. Such guidelines will be very helpful for all CT facilities and would also result in less variability among CT scan results obtained across the nation.

Default settings and vendor-supplied protocols for computed tomography may be designed to provide optimal imaging quality. However, it is often the case that sufficient image quality for the examination may be maintained by using alternative protocols that also significantly reduce radiation exposure. The Committee on CT Accreditation currently provides recommended scanning protocols as part of the accreditation program. (4)

It is impossible to estimate the total radiation dose absorbed by a patient from an xray examination without detailed information of the patient habitus and the many technical factors that go into the production of the image. Current imaging systems cannot automatically provide all the required information so that a reasonable dose estimate can be provided for the patient record. However, modern CT systems can and do calculate dose indices (e.g. CTDIvol). Although they do not represent the dose absorbed by the patient, they can be compared with benchmarks and used for quality improvement.

Beyond the dilemma of variation in protocols is also the issue of availability of dose index information in a patient record. Whereas all other medications or treatments given to a patient in a hospital or clinic are routinely accessible in the patient's medical record, radiation dose indices stand in stark contrast as missing. Current radiology information systems in hospitals generally do not collect or report dose indices; the medical imaging devices that communicate with radiology information systems for the most part do not currently forward this data, despite recommendations to the contrary from the ACR [2,5].

The ACR Dose Index Registry (DIR) will be capable of data collection and analysis required to develop national benchmarks and best practices. The ACR DIR is launching Phase II in March 2010, during which the Integrating the Healthcare Enterprise (IHE) Radiation Exposure Monitoring (REM) Profile will be implemented and using the DICOM Structured Report Supplement 127 on CT reporting. Scanners will collect dose indices in a standard format and automatically transfer that information to the DIR. Although Phase II is limited to a single scanner vendor (Siemens), Phase III will include multiple vendors and institutions and is expected to launch in early 2011.

1b.3 Citations for data on performance gap:

1. FDA Safety Investigation of CT Brain Perfusion Scans: Update 12/8/2009 Date Issued: December 8, 2009 <http://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm185898.htm>. Accessed January 29, 2010.

2. ACR PRACTICE GUIDELINE FOR DIAGNOSTIC REFERENCE LEVELS IN MEDICAL X-RAY IMAGING http://www.acr.org/SecondaryMainMenuCategories/quality_safety/RadSafety/RadiationSafety/guideline-diagnostic-reference.aspx

3. Amis Es Jr, Butler PF, Applegate KE, et al; American College of Radiology. American College of Radiology white paper on radiation dose in medicine J AM Coll Radiol. 2007;4(5):272-284.

4. McCollough C, Branham T, Herlihy V, et al. Radiation doses from the ACR CT Accreditation Program: review of data since program inception and proposals for new reference values and pass/fail limits. Presented at: RSNA 92nd Scientific Assembly and Annual Meeting; 2006.

5. Neumann RD, Bluemke DA. Tracking Radiation Exposure From Diagnostic Imaging Devices at the NIH. J Am Coll Radiol 2010;2:87-89.

1b.4 Summary of Data on disparities by population group:
 There is no data on disparities by population group available.

1b.5 Citations for data on Disparities:
 There is no data on disparities by population group available.

1c. Outcome or Evidence to Support Measure Focus

1c.1 Relationship to Outcomes (*For non-outcome measures, briefly describe the relationship to desired outcome. For outcomes, describe why it is relevant to the target population*): [Reference levels in the practice of medical X-ray imaging should be established and implemented.](#) Diagnostic reference levels are used to manage the radiation dose to the patient. The medical radiation exposure must be controlled, avoiding unnecessary radiation that does not contribute to the clinical objective of the procedure. By the same token, a dose significantly lower than the reference level may also be cause for concern, since it may indicate that adequate image quality is not being achieved. The specific purpose of the reference level is to provide a benchmark for comparison, not to define a maximum or minimum exposure limit. (1)

1c.2-3. Type of Evidence: [evidence based guideline, expert opinion](#)

1c.4 Summary of Evidence (*as described in the criteria; for outcomes, summarize any evidence that healthcare services/care processes influence the outcome*):

[ACR PRACTICE GUIDELINE FOR DIAGNOSTIC REFERENCE LEVELS IN MEDICAL X-RAY IMAGING \(2008\)](#)
[American College of Radiology White Paper on Radiation Dose in Medicine](#)

1c.5 Rating of strength/quality of evidence (*also provide narrative description of the rating and by whom*):

[Not ranked](#)

1c.6 Method for rating evidence:

1c.7 Summary of Controversy/Contradictory Evidence:

1c.8 Citations for Evidence (*other than guidelines*): [1. Amis Es Jr, Butler PF, Applegate KE, et al; American College of Radiology. American College of Radiology white paper on radiation dose in medicine J AM Coll Radiol. 2007;4\(5\):272-284.](#)

1c.9 Quote the Specific guideline recommendation (*including guideline number and/or page number*):

[This guideline recommends reference levels and suggests the methods of measurement for comparison for procedures in radiography, fluoroscopy, and CT. \(pg 1\)](#)

[Reference levels are based on actual patient doses for specific procedures measured at a number of representative clinical facilities. The levels are set at approximately the 75th percentile of these measured data, meaning that the procedures are performed at most institutions with doses at or below the reference level. Consequently, reference levels are suggested action levels at which a facility should review its methods and determine if acceptable image quality can be achieved at lower doses. \(pg 2\)](#)

1c.10 Clinical Practice Guideline Citation: [1.ACR PRACTICE GUIDELINE FOR DIAGNOSTIC REFERENCE LEVELS IN MEDICAL X-RAY IMAGING](#)

http://www.acr.org/SecondaryMainMenuCategories/quality_safety/RadSafety/RadiationSafety/guideline-diagnostic-reference.aspx

1c.11 National Guideline Clearinghouse or other URL:

1c.12 Rating of strength of recommendation (*also provide narrative description of the rating and by whom*):

[Not ranked](#)

1c
 C
 P
 M
 N

<p>1c.13 Method for rating strength of recommendation (If different from USPSTF system, also describe rating and how it relates to USPSTF):</p> <p>1c.14 Rationale for using this guideline over others:</p>	
<p>TAP/Workgroup: What are the strengths and weaknesses in relation to the sub-criteria for <i>Importance to Measure and Report</i>?</p>	1
<p>Steering Committee: Was the threshold criterion, <i>Importance to Measure and Report</i>, met? Rationale:</p>	<p>1 Y <input type="checkbox"/> N <input type="checkbox"/></p>
<p>2. SCIENTIFIC ACCEPTABILITY OF MEASURE PROPERTIES</p>	
<p>Extent to which the measure, <u>as specified</u>, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. (evaluation criteria)</p>	<p>Eval Rating</p>
<p>2a. MEASURE SPECIFICATIONS</p>	
<p>S.1 Do you have a web page where current detailed measure specifications can be obtained? S.2 If yes, provide web page URL:</p> <p>2a. Precisely Specified</p>	
<p>2a.1 Numerator Statement (Brief, text description of the numerator - what is being measured about the target population, e.g. target condition, event, or outcome): Participation in a systematic national dose index registry.</p> <p>2a.2 Numerator Time Window (The time period in which cases are eligible for inclusion in the numerator): Variable. Can be reported monthly, quarterly, annually. The measure would best be reported on an annual basis.</p> <p>2a.3 Numerator Details (All information required to collect/calculate the numerator, including all codes, logic, and definitions): Dose Index registry collects dose indices in a standardized format using DICOM Structured Report Supplement 127 for CT and the IHE Radiation Exposure Monitoring profile. Data fields include CTDIvol in milligray (mGy) by irradiation event for specified examinations, such as Adult Routine Head or Adult Routine Abdomen.</p>	
<p>2a.4 Denominator Statement (Brief, text description of the denominator - target population being measured): The measure does not have a numerator/denominator. It is strictly an attestation - Yes or No.</p> <p>2a.5 Target population gender: Female, Male 2a.6 Target population age range: All ages</p> <p>2a.7 Denominator Time Window (The time period in which cases are eligible for inclusion in the denominator):</p> <p>2a.8 Denominator Details (All information required to collect/calculate the denominator - the target population being measured - including all codes, logic, and definitions):</p>	<p>2a- specs C <input type="checkbox"/> P <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/></p>
<p>2a.9 Denominator Exclusions (Brief text description of exclusions from the target population):</p>	

<p>2a.10 Denominator Exclusion Details (<i>All information required to collect exclusions to the denominator, including all codes, logic, and definitions</i>):</p>		
<p>2a.11 Stratification Details/Variables (<i>All information required to stratify the measure including the stratification variables, all codes, logic, and definitions</i>): The measure is not stratified.</p>		
<p>2a.12-13 Risk Adjustment Type:</p>		
<p>2a.14 Risk Adjustment Methodology/Variables (<i>List risk adjustment variables and describe conceptual models, statistical models, or other aspects of model or method</i>):</p>		
<p>2a.15-17 Detailed risk model available Web page URL or attachment:</p>		
<p>2a.18-19 Type of Score: continuous variable</p>		
<p>2a.20 Interpretation of Score:</p>		
<p>2a.21 Calculation Algorithm (<i>Describe the calculation of the measure as a flowchart or series of steps</i>): The measure is an attestation that the site participates in the registry. Y or N.</p>		
<p>2a.22 Describe the method for discriminating performance (<i>e.g., significance testing</i>): N/A</p>		
<p>2a.23 Sampling (Survey) Methodology (<i>If measure is based on a sample (or survey), provide instructions for obtaining the sample, conducting the survey and guidance on minimum sample size (response rate)</i>): N/A</p>		
<p>2a.24 Data Source (<i>Check the source(s) for which the measure is specified and tested</i>) registry data, Documentation of original self-assessment</p> <p>2a.25 Data source/data collection instrument (<i>Identify the specific data source/data collection instrument, e.g. name of database, clinical registry, collection instrument, etc.</i>): The American College of Radiology Dose Index Registry</p> <p>2a.26-28 Data source/data collection instrument reference web page URL or attachment: URL http://nrdr.acr.org/</p> <p>2a.29-31 Data dictionary/code table web page URL or attachment: Attachment Dose Index Registry Data Elements_DICOM Tags.pdf</p> <p>2a.32-35 Level of Measurement/Analysis (<i>Check the level(s) for which the measure is specified and tested</i>) Clinicians: Group, Facility/Agency, Integrated delivery system, Multi-site/corporate chain, Population: national, Population: regional/network, Can be measured at all levels, Population: states, Population: counties or cities</p> <p>2a.36-37 Care Settings (<i>Check the setting(s) for which the measure is specified and tested</i>) Ambulatory Care: Ambulatory Surgery Center, Ambulatory Care: Office, Ambulatory Care: Clinic, Ambulatory Care: Emergency Dept, Ambulatory Care: Hospital Outpatient, Hospital, Other (specify) Imaging facility</p> <p>2a.38-41 Clinical Services (<i>Healthcare services being measured, check all that apply</i>) Clinicians: Physicians (MD/DO), Imaging</p>		
<p>TESTING/ANALYSIS</p>		
<p>2b. Reliability testing</p>		<p>2b C <input type="checkbox"/> P <input type="checkbox"/></p>
<p>2b.1 Data/sample (<i>description of data/sample and size</i>): Testing of the measure "Participation in a</p>		

<p>Systematic National Dose Index Registry” has not been conducted. Sites must register to participate in the registry. A list of registered sites will be maintained.</p> <p>2b.2 Analytic Method (<i>type of reliability & rationale, method for testing</i>):</p> <p>2b.3 Testing Results (<i>reliability statistics, assessment of adequacy in the context of norms for the test conducted</i>):</p>	<p>M <input type="checkbox"/></p> <p>N <input type="checkbox"/></p>
<p>2c. Validity testing</p> <p>2c.1 Data/sample (<i>description of data/sample and size</i>):</p> <p>2c.2 Analytic Method (<i>type of validity & rationale, method for testing</i>):</p> <p>2c.3 Testing Results (<i>statistical results, assessment of adequacy in the context of norms for the test conducted</i>):</p>	<p>2c</p> <p>C <input type="checkbox"/></p> <p>P <input type="checkbox"/></p> <p>M <input type="checkbox"/></p> <p>N <input type="checkbox"/></p>
<p>2d. Exclusions Justified</p> <p>2d.1 Summary of Evidence supporting exclusion(s): No exclusions.</p> <p>2d.2 Citations for Evidence:</p> <p>2d.3 Data/sample (<i>description of data/sample and size</i>):</p> <p>2d.4 Analytic Method (<i>type analysis & rationale</i>):</p> <p>2d.5 Testing Results (<i>e.g., frequency, variability, sensitivity analyses</i>):</p>	<p>2d</p> <p>C <input type="checkbox"/></p> <p>P <input type="checkbox"/></p> <p>M <input type="checkbox"/></p> <p>N <input type="checkbox"/></p> <p>NA <input type="checkbox"/></p>
<p>2e. Risk Adjustment for Outcomes/ Resource Use Measures</p> <p>2e.1 Data/sample (<i>description of data/sample and size</i>): Not required.</p> <p>2e.2 Analytic Method (<i>type of risk adjustment, analysis, & rationale</i>):</p> <p>2e.3 Testing Results (<i>risk model performance metrics</i>):</p> <p>2e.4 If outcome or resource use measure is not risk adjusted, provide rationale:</p>	<p>2e</p> <p>C <input type="checkbox"/></p> <p>P <input type="checkbox"/></p> <p>M <input type="checkbox"/></p> <p>N <input type="checkbox"/></p> <p>NA <input type="checkbox"/></p>
<p>2f. Identification of Meaningful Differences in Performance</p> <p>2f.1 Data/sample from Testing or Current Use (<i>description of data/sample and size</i>): In order to use the Dose Index Registry to establish meaningful differences in dose indices across facilities, it will be necessary to identify exams in a standard way. Based on the Dose Index Registry pilot of 1830 exams at 6 facilities, it is clear that there is no standard naming convention for a particular exam (e.g., Adult CT Head). Each facility has its own system (see example of variations in study name description below). The issue is complicated by the fact that a single exam might consist of multiple scans. For example, a ‘CT Head with contrast’ might consist of a single scan, whereas a ‘CT Head with and without contrast’ would consist of at least two scans. The ability to accurately categorize different exam types across facilities will be necessary before differences in dose indices can be compared.</p>	<p>2f</p> <p>C <input type="checkbox"/></p> <p>P <input type="checkbox"/></p> <p>M <input type="checkbox"/></p> <p>N <input type="checkbox"/></p>

The ACR Dose Index Registry will standardize exam types across facilities by collaborating with Radlex developers to identify terms to which sites will map their exams. RadLex is a developing, comprehensive radiology lexicon. More information on RadLex can be found at this link: <http://www.rsna.org/RadLex/index.cfm>

Study_Description

- Head CT BRAIN W/ IVC
- CT BRAIN WITHOUT CONTRAST
- CT BRAIN WO CON
- CT BRAIN WO IVC
- Head^01_ROUTINE_PEDS_HEAD (Child)
- Head^01_Routine_Head (Adult)
- Head^05_0_Head_500FOV_Spiral_Routine (Adult)
- Head^05_0_Head_Routine_Spiral (Adult)
- Head^05_1_Head_500FOV_SEQ_Routine (Adult)
- Head^05_1_Head_Routine_SEQ (Adult)
- Head^05_2_Trauma_Head (Adult)
- Head^1HEAD_without (Adult)
- Head^1_BRAIN_WO (Adult)
- Head^1_HEAD (Adult)
- Head^1_HEADROUTINE_18MOS_TO_3YRS (Child)
- Head^1_HEADROUTINE_3YRS_TO_10YRS (Child)
- Head^1_HEAD_WITH (Adult)
- Head^1_HEAD_WO (Adult)
- Head^1_HEAD_WO_500FOV (Adult)
- Head^1_HEAD_WO_FAST (Adult)
- Head^1_Head_Trauma (Adult)
- Head^1_Head_Trauma_500FOV (Adult)
- Head^P_05_0_HEAD_ROUTINE_SPIRAL (Child)
- Head^P_05_1_HEAD_ROUTINE_SEQ (Child)
- Head^P_05_1_HEAD_SEQ_ROUTINE (Child)
- Head^P_05_4_Head_3D (Child)

2f.2 Methods to identify statistically significant and practically/meaningfully differences in performance (type of analysis & rationale):

2f.3 Provide Measure Scores from Testing or Current Use (description of scores, e.g., distribution by quartile, mean, median, SD, etc.; identification of statistically significant and meaningfully differences in performance):

2g. Comparability of Multiple Data Sources/Methods

2g.1 Data/sample (description of data/sample and size): Since the only method and data source for the measure is the Dose Index Registry, comparability is not at issue.

2g.2 Analytic Method (type of analysis & rationale):

2g.3 Testing Results (e.g., correlation statistics, comparison of rankings):

- 2g
- C
- P
- M
- N
- NA

2h. Disparities in Care

2h.1 If measure is stratified, provide stratified results (scores by stratified categories/cohorts):

- 2h
- C
- P
- M

<p>2h.2 If disparities have been reported/identified, but measure is not specified to detect disparities, provide follow-up plans:</p>	<p>N <input type="checkbox"/> NA <input type="checkbox"/></p>
<p>TAP/Workgroup: What are the strengths and weaknesses in relation to the sub-criteria for <i>Scientific Acceptability of Measure Properties</i>?</p>	<p>2</p>
<p>Steering Committee: Overall, to what extent was the criterion, <i>Scientific Acceptability of Measure Properties</i>, met? Rationale:</p>	<p>2 C <input type="checkbox"/> P <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/></p>
<p>3. USABILITY</p>	
<p>Extent to which intended audiences (e.g., consumers, purchasers, providers, policy makers) can understand the results of the measure and are likely to find them useful for decision making. (evaluation criteria)</p>	<p>Eval Rating</p>
<p>3a. Meaningful, Understandable, and Useful Information</p> <p>3a.1 Current Use: testing not yet completed</p> <p>3a.2 Use in a public reporting initiative (disclosure of performance results to the public at large) (If used in a public reporting initiative, provide name of initiative(s), locations, Web page URL(s). If not publicly reported, state the plans to achieve public reporting within 3 years): This measure is not in current use in a public reporting program.</p> <p>As the measure developer, it is not within the purview of the American College of Radiology to implement the measure in a public reporting program. However, the ACR may in the future publish a list of sites that participate in the Dose Index Registry. Additionally, the ACR will work with organizations that have developed publicly reported quality improvement initiatives to implement and educate on the use of the measure and registry. The ACR may submit the measure to CMS for potential inclusion in the HOP QDRP or RHODAPU programs. The ACR will also continue to collaborate with the FDA on the use of diagnostic reference levels for medical imaging.</p> <p>3a.3 If used in other programs/initiatives (If used in quality improvement or other programs/initiatives, name of initiative(s), locations, Web page URL(s). If not used for QI, state the plans to achieve use for QI within 3 years): Although the measure being submitted is not in current use, the ACR recently implemented maximum radiation dose estimate pass/fail criteria for its CT Accreditation Program adult head, adult abdomen and pediatric head exams. Accreditation status of sites is publicly available on the ACR website. See: http://www.acr.org/accreditation/AccreditedFacilitySearch.aspx</p> <p>Testing of Interpretability (Testing that demonstrates the results are understood by the potential users for public reporting and quality improvement)</p> <p>3a.4 Data/sample (description of data/sample and size):</p> <p>3a.5 Methods (e.g., focus group, survey, QI project):</p> <p>3a.6 Results (qualitative and/or quantitative results and conclusions):</p>	<p>3a C <input type="checkbox"/> P <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/></p>
<p>3b/3c. Relation to other NQF-endorsed measures</p> <p>3b.1 NQF # and Title of similar or related measures: NQF 0510 Exposure time reported for procedures using fluoroscopy AND NQF Safe Practices #34 Pediatric Imaging</p>	
<p>(for NQF staff use) Notes on similar/related endorsed or submitted measures:</p>	
<p>3b. Harmonization If this measure is related to measure(s) already endorsed by NQF (e.g., same topic, but different target</p>	<p>3b C <input type="checkbox"/></p>

<p>population/setting/data source <u>or</u> different topic but same target population): 3b.2 Are the measure specifications harmonized? If not, why? Population target of NQF 0150 is not for patients undergoing CT imaging as is the measure being proposed. Safe Practice #34 target population is children. The proposed measure is for all ages. Also Safe Practice #34 recommends practice improvements to use the lowest dose possible in pediatric CT imaging but does not focus on tracking and calculation of CT dose estimate over a period of time.</p>	P <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>
<p>3c. Distinctive or Additive Value 3c.1 Describe the distinctive, improved, or additive value this measure provides to existing NQF-endorsed measures: The only related NQF measure is "Exposure Time Reported for Procedures Using Fluoroscopy". Currently, the Dose Index Registry does not collect data on fluoroscopy procedures, so the "Participation in a Systematic National Dose Index Registry" measure is distinct from the Fluoro Time measure. Although distinct, it goes beyond what the fluoro measure looks for, because the registry measure will give sites feedback on their radiation dose levels in comparison with national and regional benchmarks.</p> <p>5.1 Competing Measures If this measure is similar to measure(s) already endorsed by NQF (i.e., on the same topic and the same target population), describe why it is a more valid or efficient way to measure quality:</p>	3c C <input type="checkbox"/> P <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/>
<p>TAP/Workgroup: What are the strengths and weaknesses in relation to the sub-criteria for <i>Usability</i>?</p>	3
<p>Steering Committee: Overall, to what extent was the criterion, <i>Usability</i>, met? Rationale:</p>	3 C <input type="checkbox"/> P <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/>
<p>4. FEASIBILITY</p>	
<p>Extent to which the required data are readily available, retrievable without undue burden, and can be implemented for performance measurement. (evaluation criteria)</p>	<p>Eval Rating</p>
<p>4a. Data Generated as a Byproduct of Care Processes 4a.1-2 How are the data elements that are needed to compute measure scores generated? data generated as byproduct of care processes during delivery,</p>	4a C <input type="checkbox"/> P <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/>
<p>4b. Electronic Sources 4b.1 Are all the data elements available electronically? (<i>elements that are needed to compute measure scores are in defined, computer-readable fields, e.g., electronic health record, electronic claims</i>) Yes</p> <p>4b.2 If not, specify the near-term path to achieve electronic capture by most providers.</p>	4b C <input type="checkbox"/> P <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/>
<p>4c. Exclusions 4c.1 Do the specified exclusions require additional data sources beyond what is required for the numerator and denominator specifications? No</p> <p>4c.2 If yes, provide justification.</p>	4c C <input type="checkbox"/> P <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/> NA <input type="checkbox"/>
<p>4d. Susceptibility to Inaccuracies, Errors, or Unintended Consequences 4d.1 Identify susceptibility to inaccuracies, errors, or unintended consequences of the measure and describe how these potential problems could be audited. If audited, provide results.</p>	4d C <input type="checkbox"/> P <input type="checkbox"/> M <input type="checkbox"/>

<p>Sites must register to participate in the registry. A list of registered sites will be maintained.</p>	<p>N <input type="checkbox"/></p>
<p>4e. Data Collection Strategy/Implementation</p> <p>4e.1 Describe what you have learned/modified as a result of testing and/or operational use of the measure regarding data collection, availability of data/missing data, timing/frequency of data collection, patient confidentiality, time/cost of data collection, other feasibility/ implementation issues:</p> <p>As mentioned in the "Identification of Meaningful Differences" section, in order to use the Dose Index Registry to establish meaningful differences in dose indices across facilities, it will be necessary to identify exams in a standard way. Based on the Dose Index Registry pilot of 1830 exams at 6 facilities, it is clear that there is no standard naming convention for a particular exam (e.g., Adult CT Head). Each facility has its own system (see example of variations in study name description below). The issue is complicated by the fact that a single exam might consist of multiple scans. For example, a 'CT Head with contrast' might consist of a single scan, whereas a 'CT Head with and without contrast' would consist of at least two scans. The ability to accurately categorize different exam types across facilities will be necessary before differences in dose indices can be compared.</p> <p>The ACR Dose Index Registry will standardize exam types across facilities by collaborating with Radlex developers to identify terms to which sites will map their exams. RadLex is a developing, comprehensive radiology lexicon. More information on RadLex can be found at this link: http://www.rsna.org/RadLex/index.cfm</p> <p>Study_Description Head CT BRAIN W/ IVC CT BRAIN WITHOUT CONTRAST CT BRAIN WO CON CT BRAIN WO IVC Head^01_ROUTINE_PEDS_HEAD (Child) Head^01_Routine_Head (Adult) Head^05_0_Head_500FOV_Spiral_Routine (Adult) Head^05_0_Head_Routine_Spiral (Adult) Head^05_1_Head_500FOV_SEQ_Routine (Adult) Head^05_1_Head_Routine_SEQ (Adult) Head^05_2_Trauma_Head (Adult) Head^1HEAD_without (Adult) Head^1_BRAIN_WO (Adult) Head^1_HEAD (Adult) Head^1_HEADROUTINE_18MOS_TO_3YRS (Child) Head^1_HEADROUTINE_3YRS_TO_10YRS (Child) Head^1_HEAD_WITH (Adult) Head^1_HEAD_WO (Adult) Head^1_HEAD_WO_500FOV (Adult) Head^1_HEAD_WO_FAST (Adult) Head^1_Head_Trauma (Adult) Head^1_Head_Trauma_500FOV (Adult) Head^P_05_0_HEAD_ROUTINE_SPIRAL (Child) Head^P_05_1_HEAD_ROUTINE_SEQ (Child) Head^P_05_1_HEAD_SEQ_ROUTINE (Child) Head^P_05_4_Head_3D (Child)</p> <p>4e.2 Costs to implement the measure (costs of data collection, fees associated with proprietary measures):</p> <p>The measures are not proprietary; no fees are associated with their use. However, there is a small annual fee to sites to participate in the ACR Dose Index Registry. The annual registry participation fee is based on number of radiologists at the site, and would be typically \$500 - \$1,000 per year.</p>	<p>4e C <input type="checkbox"/> P <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/></p>

4e.3 Evidence for costs:	
4e.4 Business case documentation:	
TAP/Workgroup: What are the strengths and weaknesses in relation to the sub-criteria for <i>Feasibility</i> ?	4
Steering Committee: Overall, to what extent was the criterion, <i>Feasibility</i> , met? Rationale:	4 C <input type="checkbox"/> P <input type="checkbox"/> M <input type="checkbox"/> N <input type="checkbox"/>
RECOMMENDATION	
(for NQF staff use) Check if measure is untested and only eligible for time-limited endorsement.	Time-limited <input type="checkbox"/>
Steering Committee: Do you recommend for endorsement? Comments:	Y <input type="checkbox"/> N <input type="checkbox"/> A <input type="checkbox"/>
CONTACT INFORMATION	
<p>Co.1 Measure Steward (Intellectual Property Owner)</p> <p>Co.1 <u>Organization</u> American College of Radiology 1891 Preston White Drive Reston Virginia 20191</p> <p>Co.2 <u>Point of Contact</u> Judy Burlleson, MHSA jburleson@acr-arrrs.org 703-648-3787</p>	
<p>Measure Developer If different from Measure Steward</p> <p>Co.3 <u>Organization</u> American College of Radiology 1891 Preston White Drive Reston Virginia 20191</p> <p>Co.4 <u>Point of Contact</u> Judy Burlleson, MHSA jburleson@acr-arrrs.org 703-648-3787</p>	
<p>Co.5 Submitter If different from Measure Steward POC Judy Burlleson, MHSA jburleson@acr-arrrs.org 703-648-3787- American College of Radiology</p>	
<p>Co.6 Additional organizations that sponsored/participated in measure development</p>	
ADDITIONAL INFORMATION	
<p>Workgroup/Expert Panel involved in measure development</p> <p>Ad.1 Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development. American College of Radiology Dose Index Registry Measure Workgroup Rick Morin, PHD, FAAPM Chair of DIR Committee and Measure Workgroup Priscilla Butler M.S., FACR, FAAPM ACR Staff Physics Commission, DIR Committee member Laura Coombs, PhD ACR Director of Registries</p>	
<p>Ad.2 If adapted, provide name of original measure: Ad.3-5 If adapted, provide original specifications URL or attachment</p>	
<p>Measure Developer/Steward Updates and Ongoing Maintenance</p> <p>Ad.6 Year the measure was first released: 2010 Ad.7 Month and Year of most recent revision: 2010-03 Ad.8 What is your frequency for review/update of this measure? Annually Ad.9 When is the next scheduled review/update for this measure? 2011-03</p>	

Ad.10 Copyright statement/disclaimers:
Ad.11 -13 Additional Information web page URL or attachment:
Date of Submission (<i>MM/DD/YY</i>): 04/07/2010