American College of Radiology National Radiology Data Registry

Qualified Clinical Data Registry Measures

January 2018

QCDR Measure	ACRad 1
Measure Title	CT Colonography True Positive Rate

Measure Description	Percentage of exams with a ≥10mm polyp detected by CTC that was with confirmed by colonoscopy (True Positive Rate)
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Effective Clinical Care
NQS Domain Rationale	The rationale for placing this measure in the Effective Clinical Care domain is based on the quality action of the measure as described below: Quality action for provider: Improve own diagnostic performance and only call an exam positive if it indicates a high probability of cancer. Quality action for group: Monitor one another's performance and ensure that a group has adequate processes and training to ensure that a high percent of exams found to be positive on imaging are also positive on tissue diagnosis.
Denominator	Number of CT colonography (CTC) exams with a ≥10mm polyp for which data on confirming colonoscopies is available
Denominator Data Elements	Exam date; Polyp size ≥10mm?; Did colonoscopy or surgery reach level of lesion?
Denominator Exclusions	None
Denominator Exceptions	Number of exams with confirming colonoscopies that did not reach the level of lesion, or with no confirming colonoscopy (Data elements: Level of lesion (<10mm); Confirming colonoscopy or surgery not available)
Numerator	Number of exams with a confirmed ≥10mm polyp at colonoscopy that corresponds to a polyp detected by CTC. (A polyp confirmed by colonoscopy corresponds to a polyp detected at CTC if it is within 1 segment and 50% of the size of the CTC polyp, e.g., a polyp of 12mm at CTC must have a measurement of at least 6mm at colonoscopy.)
Numerator Excluions	None
Numerator Data Elements	Was polyp confirmed?
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A

QCDR Measure	ACRad 1
Measure Title	CT Colonography True Positive Rate

Measure Type (Process/Outcome)	Outcome
High Priority Measure	Not applicable
Outcome Measure	Yes
Inverse measure	No
Proportion Measure	Yes
Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (CT Colonography Registry Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2014. An assessment of diagnostic or interpretative performance is an essential part of a cancer screening and diagnosis program. This is a primary measure of diagnostic accuracy. High true positive rate is indicative of patient receiving most clinically appropriate screening, where imaging findings of disease are highly likely to be confirmed as true. When CTC is used for screening, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. This measure will work better for a group, so we will recommend it for group use but also permit it for individual providers. Colorectal cancer is a leading cause of mortality. Early detection programs provide an opportunity to save many lives. CT Colonography permits a minimally invasive, low-risk evaluation for cancerous polyps. Studies have shown that CT colonography is effective in screening patients with average risk of cancer. The True Positive Rate measure is designed to monitor and improve the interpretation quality of these studies in routine clinical practice. Observational studies have shown that CT colonography commonly detects extracolonic findings that can be considered clinically important when applied to an asymptomatic screening population.

References:
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cancer, extracolonic cancer, and aortic aneurysm: model simulation with cost-effectiveness analysis.
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extracolonic findings, recommendations for additional imaging, and polyp prevalence. Radiology.
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prevalence and analysis of features for guiding management. AJR 2011;197:139-145.
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asymptomatic women over 50 years of age: implications for clinical management and ovarian cancer
screening. Radiology 2010; 257:144–150.
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colonography: clinical and economic impact. Radiology. 2008;249:151-159.
7. Pickhardt PJ, Kim DH, Meiners RJ, Wyatt KS, Hanson ME, Barlow DS, Cullen PA, Remtulla RA, Cash
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8. Pickhardt PJ, Lee LJ, del Rio AM, Lauder T, Bruce RJ, Summers RM, Pooler BD, Binkley N.
Simultaneous screening for osteoporosis at CT colonography: Bone mineral density assessment
using MDCT attenuation techniques compared against the DXA reference standard. J Bone Miner
Res. 2011 Sep;26(9):2194-203.doi:10.1002/jbmr.428.
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osteoporosis using abdominal CT scans obtained for other indications. Ann Int Med 2013;158:588-
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10. Summers RM, Baecher N, Yao J, Liu J, Pickhardt PJ, Choi JR, Hill S. Feasibility of simultaneous CT

	colonography and fully-automated bone mineral densitometry in a single examination. J Comput Assist Tomogr 2011;35:212-216. 11. Summers RM, Liu J, Sussman DL, Dwyer AJ, Rehani B, Pickhardt PJ, Choi JR, YaoJ. Association between visceral adiposity and colorectal polyps on CT colonography. AJR 2012;199:48-57. 12. Veerappan GR, Ally MR, Choi JR, et al. Extracolonic findings on CT colonography increases yield of colorectal cancer screening. AJR. 2010;195:677-686. 13. Yee J, Sadda S, Aslam R, Yeh B. Extracolonic Findings at CT Colonography. Gastrointest Endoscopy Clin N Am. 2010:305-322.
Rationale	(This measure was discussed with CMS and is being submitted following that discussion, with some clarifications added to the specifications.) An assessment of diagnostic or interpretative performance is an essential part of a cancer screening and diagnosis program. This is a primary measure of diagnostic accuracy. High true positive rate is indicative of patient receiving most clinically appropriate screening, where imaging findings of disease are highly likely to be confirmed as true. When CTC is used for screening, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. This measure will work better for a group, so we will recommend it for group use but also permit it for individual providers. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

Measure Description	The fraction of all screening mammograms that are interpreted as positive (abnormal) and have a tissue diagnosis of cancer within 12 months (expressed per 1000 exams, not as a percentage)
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Effective Clinical Care
NQS Domain Rationale	The rationale for including this measure in the Effective Clinical Care domain is based on the quality action of the measure as shown below: Quality action for provider: Improve own diagnostic performance and participate in ongoing training to ensure that no cancers are missed. Positive findings on screening are infrequent and may be easy to miss without adequate vigilance or training. Quality action for group: Monitor one another's performance and ensure that a group has adequate processes and training to ensure an effective screening program.
Denominator	Number of screening mammograms
Denominator Data Elements	Indication for examination; Exam date; Assessment (BI-RADS) category
Denominator Exclusions	None
Denominator Exceptions	None
Numerator	Number of screening mammograms with abnormal interpretation (BI-RADS 0, 3, 4 or 5) that have a tissue diagnosis of cancer within 12 months
Numerator Excluions	None
Numerator Data Elements	Biopsy date; Classification of lesion (benign, high risk, malignant); Malignancy type
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome

High Priority Measure	Not applicable
Outcome Measure	Yes
Inverse measure	No
Proportion Measure	Yes
Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (National Mammography Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2014. Cancer detection is the primary goal of screening mammography. A high cancer detection rate is indicative of patient receiving effective screening, where positive findings on imaging are highly likely to be confirmed as malignant disease by pathology results. Three major goals of screening mammography include: 1) Find a high percentage of the cancersthat exist in a screening population (cancer detection rate), 2) Find these cancers within an acceptable range of recommendations for recall or biopsy to minimize cost and morbidity (abnormal interpretation, PPV), 3) Find a high percentage ofsmall, node-negative cancers, which are more likely to be curable (rate of minimal cancer, node-negative) There also is evidence of considerable variability in performance parameters among interpreting radiologists. These measures are designed to assess the outcome and effectiveness of the interpretation of screening mammography studies. Evidence-based guidelines, observational studies, randomized controlled trials, systematic syntheses of research and meta-analyses all provide support for the high impact these mammography measures have on quality healthcare. Mammograms affect large numbers of

patients, are frequently performed, relate to a leading cause of morbidity/mortality, in many cases demonstrate a severity of illness, and could impact high resource use.

There also is evidence of considerable variability in performance parameters among interpreting radiologists. These measures are designed to assess the outcome and effectiveness of the interpretation of screening mammography studies.

References:
1. Burnside ES, Lin Y, Munoz Del Rio A, Pickhardt PJ, Wu Y, Strigel RM, Elezaby MA, Kerr EA, Miglioretti DL. Addressing the challenge of assessing physician-level screening performance: mammography as an example. PLoS One. 2014 Feb 21; 9(2):e89418. doi: 10.1371/journal.pone.0089418. eCollection 2014. PubMed PMID: 24586763; PubMed Central PMCID: PMC3931752.
2. Carney PA, Sickles EA, Monsees BS, Bassett LW, Brenner RJ, Feig SA, Smith RA, Rosenberg RD, Bogart TA, Browning S, Barry JW, Kelly MM, Tran KA, Miglioretti DL. Identifying minimally acceptable interpretive performance criteria for screening mammography. Radiology. 2010 May; 255(2):354-61. doi: 10.1148/radiol.10091636. PubMed PMID: 20413750; PubMed Central PMCID: PMC2858814.
3. D'Orsi CJ, Sickles EA, Mendelson EB, Morris EA et al. ACR BI-RADS® Atlas, Breast Imaging Reporting and Data System. Reston, VA, American College of Radiology; 2013.
4. Humphrey LL, Helfand M, Chan BK, Woolf SH. Breast cancer screening: a summary of the evidence for the U.S. Preventive Services Task Force. Ann Intern Med. 2002 Sep 3; 137 (5 Part 1):347-60. PubMed PMID: 12204020.
5. Nass SJ, Ball J. Improving Breast Imaging Quality Standards. Washington, DC: National Academy of Science; 2005.
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	Kerlikowske K, Buist DS, Weaver DL, Barlow WE, Ballard-Barbash R. Performance benchmarks for screening mammography. Radiology. 2006 Oct; 241(1):55-66. PubMed PMID: 16990671. 8. Schell MJ, Yankaskas BC, Ballard-Barbash R, Qaqish BF, Barlow WE, Rosenberg RD, Smith-Bindman R. Evidence-based target recall rates forscreening mammography. Radiology. 2007 Jun;243(3):681-9. PubMed PMID: 17517927. 9. Tabar L, Vitak B, Hsiu-His T, Ming-Fang A, Cohen A, Tot T, Yueh-Hsia Chieu S, Li-Sheng Chen S, ChingYuan Fann J, Rosell J, Fohlin H, Smith RA, Duffy SW. Swedish Two-County Trial: Impact of Mammographic Screening on Breast Cancer Mortality during 3 Decades. Radiology. 2011 Sep;260(3):658-63. 10. Lee CS, Bhargavan-Chatfield M, Burnside ES, Nagy P, Sickles EA. The National Mammography Database: Preliminary Data. American Journal of Roentgenology. 2016 Apr;206(4):883-90.
Rationale	(This measure was discussed with CMS; we are retaining this measure and dropping ACRad 4 as ACRad 4 is contained withing ACRad 3.) Cancer detection is the primary goal of screening mammography. A high cancer detection rate is indicative of patient receiving effective screening, where positive findings on imaging are highly likely to be confirmed as malignant disease by pathology results. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 5
Measure Title	Screening Mammography Abnormal Interpretation Rate (Recall Rate)

Measure Description	The percentage of screening mammograms interpreted as positive (abnormal)
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Efficiency and Cost
NQS Domain Rationale	The rationale for including this measure in the Efficiency and Cost domain is based on the quality action for the measure as shown below: Quality action for provider: Improve own diagnostic performance and only call an exam positive if it indicates a high probability of cancer. Quality action for group: Monitor one another's performance and ensure that a group has adequate processes and training to ensure that a high percent of exams found to be positive on imaging are also positive on tissue diagnosis.
Denominator	Number of screening mammograms
Denominator Data Elements	Indication for examination; Exam date
Denominator Exclusions	None
Denominator Exceptions	None
Numerator	Number of screening mammograms with abnormal interpretation (BI-RADS 0, 3, 4 or 5)
Numerator Excluions	None
Numerator Data Elements	Assessment category
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Efficiency
Outcome Measure	Yes
Inverse measure	Yes

Proportion Measure	Yes
Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (National Mammography Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2014. Abnormal interpretation rate or recall rate is a useful approximation of one type of false-positive outcome (recall at screening, not necessarily leading to biopsy). A high recall rate results in the patient potentially receiving unnecessary follow up imaging and biopsy. When mammography is used for screening, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Three major goals of screening mammography include: 1) Find a high percentage of the cancersthat exist in a screening population (cancer detection rate), 2) Find these cancers within an acceptable range of recommendations for recall or biopsy to minimize cost and morbidity (abnormal interpretation, PPV), 3) Find a high percentage ofsmall, node-negative cancers, which are more likely to be curable (rate of minimal cancer, node-negative) There also is evidence of considerable variability in performance parameters among interpreting radiologists. These measures are designed to assess the outcome and effectiveness of the interpretation of screening mammography studies. Evidence-based guidelines, observational studies, randomized controlled trials, systematic syntheses of research and meta-analyses all provide support for the high impact these mammography measures have on quality healthcare. Mammograms affect large numbers of patients, are frequently performed, relate to a leading cause of morbidity/mortality, in many cases demonstrate a severity of illness, and could

impact high resource use.

There also is evidence of considerable variability in performance parameters among interpreting radiologists. These measures are designed to assess the outcome and effectiveness of the interpretation of screening mammography studies.

References:
1. Burnside ES, Lin Y, Munoz Del Rio A, Pickhardt PJ, Wu Y, Strigel RM, Elezaby MA, Kerr EA, Miglioretti DL. Addressing the challenge of assessing physician-level screening performance: mammography as an example. PLoS One. 2014 Feb 21; 9(2):e89418. doi: 10.1371/journal.pone.0089418. eCollection 2014. PubMed PMID: 24586763; PubMed Central PMCID: PMC3931752.
2. Carney PA, Sickles EA, Monsees BS, Bassett LW, Brenner RJ, Feig SA, Smith RA, Rosenberg RD, Bogart TA, Browning S, Barry JW, Kelly MM, Tran KA, Miglioretti DL. Identifying minimally acceptable interpretive performance criteria for screening mammography. Radiology. 2010 May; 255(2):354-61. doi: 10.1148/radiol.10091636. PubMed PMID: 20413750; PubMed Central PMCID: PMC2858814.
3. D'Orsi CJ, Sickles EA, Mendelson EB, Morris EA et al. ACR BI-RADS® Atlas, Breast Imaging Reporting and Data System. Reston, VA, American College of Radiology; 2013.
4. Humphrey LL, Helfand M, Chan BK, Woolf SH. Breast cancer screening: a summary of the evidence for the U.S. Preventive Services Task Force. Ann Intern Med. 2002 Sep 3; 137 (5 Part 1):347-60. PubMed PMID: 12204020.
5. Nass SJ, Ball J. Improving Breast Imaging Quality Standards. Washington, DC: National Academy of Science; 2005.
6. Rauscher GH, Murphy AM, Orsi JM, Dupuy DM, Grabler PM, Weldon CB. Beyond the mammography quality standards act: measuring the quality of breast cancer screening programs. AJR Am J Roentgenol. 2014 Jan; 202(1):145-51. doi: 10.2214/AJR.13.10806. Epub 2013 Nov 21. PubMed PMID: 24261339.
7. Rosenberg RD, Yankaskas BC, Abraham LA, Sickles EA, Lehman CD, Geller BM, Carney PA, Kerlikowske K, Buist DS, Weaver DL, Barlow WE, Ballard-Barbash R. Performance benchmarks for screening mammography. Radiology. 2006 Oct; 241(1):55-66.

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Rationale	2014 (This measure was discussed with CMS and is being submitted following that discussion.) Abnormal interpretation rate or recall rate is a useful approximation of one type of false-positive outcome (recall at screening, not necessarily leading to biopsy). A high recall rate results in the patient potentially receiving unnecessary follow up imaging and biopsy. When mammography is used for screening, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 6
Measure Title	Screening Mammography Positive Predictive Value 2 (PPV2 - Biopsy Recommended)

Measure Description	The percentage of screening mammograms where biopsy was recommended that have a tissue diagnosis of cancer within 12 months. Note: Recommendation for biopsy may be made on the basis of a diagnostic mammogram that was initiated by findings on the screening
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Effective Clinical Care
NQS Domain Rationale	The rationale for placing this measure in the Effective Clinical Care domain is based on the quality action of the measure as shown below: Quality action for provider: Follow guidelines and assess an exam as BI-RADS 4 or 5 only if findings point to a high probability of cancer. Seek training if performance is below benchmark.
Denominator	Number of screening mammograms with a recommendation for biopsy (BI-RADS 4 or 5)
Denominator Data Elements	Indication for examination; Exam date; Assessment category - screening exam; Assessment category - associated diagnostic mammogram
Denominator Exclusions	None
Denominator Exceptions	None
Numerator	Number of screening mammograms with a recommendation for biopsy (BI-RADS 4 or 5) that have a tissue diagnosis of cancer within 12 months
Numerator Excluions	None
Numerator Data Elements	Biopsy date; Classification of lesion; Malignancy type
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Not applicable

QCDR Measure	ACRad 6
Measure Title	Screening Mammography Positive Predictive Value 2 (PPV2 - Biopsy Recommended)

Outcome Measure	Yes
Inverse measure	No
Proportion Measure	Yes
Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (National Mammography Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2014. There was a suggestion for this measure to be combined with the cancer detection rate measures ACRad 3 and ACRad 4, but the denominator for this measure is different from the denominator for ACRad 3 and 4. PPV2 is a useful approximation of the other type of false-positive outcome (biopsy with benign diagnosis). A high true positive rate is indicative of patient receiving most clinically appropriate care. When mammography is used for screening, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Three major goals of screening mammography include: 1) Find a high percentage of the cancersthat exist in a screening population (cancer detection rate), 2) Find these cancers within an acceptable range of recommendations for recall or biopsy to minimize cost and morbidity (abnormal interpretation, PPV), 3) Find a high percentage ofsmall, node-negative cancers, which are more likely to be curable (rate of minimal cancer, node-negative) There also is evidence of considerable variability in performance parameters among interpreting radiologists. These measures are designed to assess the outcome and effectiveness of the interpretation of screening mammography studies. Evidence-based guidelines, observational studies, randomized

controlled trials, systematic syntheses of research and meta-analyses all provide support for the high impact these mammography measures have on quality healthcare. Mammograms affect large numbers of patients, are frequently performed, relate to a leading cause of morbidity/mortality, in many cases demonstrate a severity of illness, and could impact high resource use.

There also is evidence of considerable variability in performance parameters among interpreting radiologists. These measures are designed to assess the outcome and effectiveness of the interpretation of screening mammography studies.

References:

1. Burnside ES, Lin Y, Munoz Del Rio A, Pickhardt PJ, Wu Y, Strigel RM, Elezaby MA, Kerr EA, Miglioretti DL. Addressing the challenge of assessing physician-level screening performance: mammography as an example. PLoS One. 2014 Feb 21; 9(2):e89418. doi: 10.1371/journal.pone.0089418. eCollection 2014. PubMed PMID: 24586763; PubMed Central PMCID: PMC3931752.
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3. D'Orsi CJ, Sickles EA, Mendelson EB, Morris EA et al. ACR BI-RADS® Atlas, Breast Imaging Reporting and Data System. Reston, VA, American College of Radiology; 2013.
4. Humphrey LL, Helfand M, Chan BK, Woolf SH. Breast cancer screening: a summary of the evidence for the U.S. Preventive Services Task Force. Ann Intern Med. 2002 Sep 3; 137 (5 Part 1):347-60. PubMed PMID: 12204020.
5. Nass SJ, Ball J. Improving Breast Imaging Quality Standards. Washington, DC: National Academy of Science; 2005.
6. Rauscher GH, Murphy AM, Orsi JM, Dupuy DM, Grabler PM, Weldon CB. Beyond the mammography quality standards act: measuring the quality of breast cancer screening programs. AJR Am J Roentgenol. 2014 Jan; 202(1):145-51. doi:

	10.2214/AJR.13.10806. Epub 2013 Nov 21. PubMed PMID: 24261339. 7. Rosenberg RD, Yankaskas BC, Abraham LA, Sickles EA, Lehman CD, Geller BM, Carney PA, Kerlikowske K, Buist DS, Weaver DL, Barlow WE, Ballard-Barbash R. Performance benchmarks for screening mammography. Radiology. 2006 Oct; 241(1):55-66. PubMed PMID: 16990671. 8. Schell MJ, Yankaskas BC, Ballard-Barbash R, Qaqish BF, Barlow WE, Rosenberg RD, Smith-Bindman R. Evidence-based target recall rates forscreening mammography. Radiology. 2007 Jun;243(3):681-9. PubMed PMID: 17517927. 9. Tabar L, Vitak B, Hsiu-His T, Ming-Fang A, Cohen A, Tot T, Yueh-Hsia Chieu S, Li-Sheng Chen S, ChingYuan Fann J, Rosell J, Fohlin H, Smith RA, Duffy SW. Swedish Two-County Trial: Impact of Mammographic Screening on Breast Cancer Mortality during 3 Decades. Radiology. 2011 Sep;260(3):658-63. 10. Lee CS, Bhargavan-Chatfield M, Burnside ES, Nagy P, Sickles EA. The National Mammography Database: Preliminary Data. American Journal of Roentgenology. 2016 Apr;206(4):883-90.
Rationale	(This measure was discussed with CMS and is being submitted following that discussion. There was a suggestion for this measure to be combined with the cancer detection rate measures ACRad 3 and ACRad 4, but the denominator for this measure is different from the denominator for ACRad 3 and 4.) PPV2 is a useful approximation of the other type of false-positive outcome (biopsy with benign diagnosis). A high true positive rate is indicative of patient receiving most clinically appropriate care. When mammography is used for screening, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 7
Measure Title	Screening Mammography Node Negativity Rate

Measure Description	The percentage of invasive cancers detected at screening mammography that are node negative
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Effective Clinical Care
NQS Domain Rationale	The rationale for including this measure in the Effective Clinical Care domain is based on the quality action for the measure as shown below: Quality action: Ensure effective implementation of ongoing screening program and patient engagement to ensure adequate follow up and compliance. Implement screening program in a manner that ensures that cancers are detected when the prognosis is still good.
Denominator	Number of invasive cancers detected at screening mammography
Denominator Data Elements	Indication for examination; Exam date; Classification of lesion; Malignancy type
Denominator Exclusions	None
Denominator Exceptions	None
Numerator	Number of invasive cancers detected at screening mammography that are node negative
Numerator Excluions	None
Numerator Data Elements	Nodal status
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Not applicable
Outcome Measure	Yes
Inverse measure	No

QCDR Measure	ACRad 7
Measure Title	Screening Mammography Node Negativity Rate

Proportion Measure	Yes
Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (National Mammography Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2014. This measure is recommended for use for group reporting only. Node negativity reflects predictor of cancer prognosis, so it is the best measure to assess for "earliness" of detection. Detecting a cancer when it is node-negative alerts the patient about disease when it is curable, and provides the patient and treating physician more options for planning treatment as well as higher likelihood of positive outcome of treatment. When mammography is used for screening, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Three major goals of screening mammography include: 1) Find a high percentage of the cancersthat exist in a screening population (cancer detection rate), 2) Find these cancers within an acceptable range of recommendations for recall or biopsy to minimize cost and morbidity (abnormal interpretation, PPV), 3) Find a high percentage ofsmall, node-negative cancers, which are more likely to be curable (rate of minimal cancer, node-negative) There also is evidence of considerable variability in performance parameters among interpreting radiologists. These measures are designed to assess the outcome and effectiveness of the interpretation of screening mammography studies. Evidence-based guidelines, observational studies, randomized controlled trials, systematic syntheses of research and meta-analyses all provide support for the high impact these mammography measures have on quality healthcare. Mammograms affect large numbers of patients, are frequently performed, relate

to a leading cause of morbidity/mortality, in many cases demonstrate a severity of illness, and could impact high resource use.

There also is evidence of considerable variability in performance parameters among interpreting radiologists. These measures are designed to assess the outcome and effectiveness of the interpretation of screening mammography studies.

References:
1. Burnside ES, Lin Y, Munoz Del Rio A, Pickhardt PJ, Wu Y, Strigel RM, Elezaby MA, Kerr EA, Miglioretti DL. Addressing the challenge of assessing physician-level screening performance: mammography as an example. PLoS One. 2014 Feb 21; 9(2):e89418. doi: 10.1371/journal.pone.0089418. eCollection 2014. PubMed PMID: 24586763; PubMed Central PMCID: PMC3931752.
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Rationale	(This measure was discussed with CMS and is being submitted following that discussion with the modification limiting it for use for group reporting only.) This measure is recommended for use for group reporting only. Node negativity reflects predictor of cancer prognosis, so it is the best measure to assess for "earliness" of detection. Detecting a cancer when it is node-negative alerts the patient about disease when it is curable, and provides the patient and treating physician more options for planning treatment as well as higher likelihood of positive outcome of treatment. When mammography is used for screening, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 8
Measure Title	Screening Mammography Minimal Cancer Rate

Measure Description	The percentage of cancers detected at screening mammography that are invasive carcinoma ≤10mm or DCIS
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Effective Clinical Care
NQS Domain Rationale	The rationale for including this measure in the Effective Clinical Care domain is based on the quality action of the measure as shown below: Quality action: Ensure effective implementation of ongoing screening program and patient engagement to ensure adequate follow up and compliance. Implement screening program in a manner that ensures that cancers are detected when the prognosis is still good.
Denominator	Number of cancers detected at screening mammography
Denominator Data Elements	Indication for examination; Exam date; Classification of lesion; Malignancy type
Denominator Exclusions	None
Denominator Exceptions	None
Numerator	Number of cancers detected at screening mammography that are invasive carcinoma ≤10mm or DCIS
Numerator Excluions	None
Numerator Data Elements	Tumor size; Malignancy type
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Not applicable
Outcome Measure	Yes
Inverse measure	No
Proportion Measure	Yes

Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (National Mammography Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2014 and is recommended for use for group reporting only. Minimal cancer rate is another indicator of the "earliness" of cancer detection. Unlike node negativity, it includes DCIS, but among invasive cancers it is limited to node negative tumors no larger than 10mm. Detecting a cancer when it is minimal alerts the patient about disease when it is curable, and provides the patient and treating physician more options for planning treatment as well as higher likelihood of positive outcome of treatment. When mammography is used for screening, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Three major goals of screening mammography include: 1) Find a high percentage of the cancersthat exist in a screening population (cancer detection rate), 2) Find these cancers within an acceptable range of recommendations for recall or biopsy to minimize cost and morbidity (abnormal interpretation, PPV), 3) Find a high percentage ofsmall, node-negative cancers, which are more likely to be curable (rate of minimal cancer, node-negative) There also is evidence of considerable variability in performance parameters among interpreting radiologists. These measures are designed to assess the outcome and effectiveness of the interpretation of screening mammography studies. Evidence-based guidelines, observational studies, randomized controlled trials, systematic syntheses of research and meta-analyses all provide support for the high impact these mammography measures have on quality healthcare. Mammograms affect large numbers of patients, are frequently performed, relate

to a leading cause of morbidity/mortality, in many cases demonstrate a severity of illness, and could impact high resource use.

There also is evidence of considerable variability in performance parameters among interpreting radiologists. These measures are designed to assess the outcome and effectiveness of the interpretation of screening mammography studies.

References:

1. Burnside ES, Lin Y, Munoz Del Rio A, Pickhardt PJ, Wu Y, Strigel RM, Elezaby MA, Kerr EA, Miglioretti DL. Addressing the challenge of assessing physician-level screening performance: mammography as an example. PLoS One. 2014 Feb 21; 9(2):e89418. doi: 10.1371/journal.pone.0089418. eCollection 2014. PubMed PMID: 24586763; PubMed Central PMCID: PMC3931752.
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5. Nass SJ, Ball J. Improving Breast Imaging Quality Standards. Washington, DC: National Academy of Science; 2005.
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Rationale	(This measure was discussed with CMS and is being submitted following that discussion with the modification limiting it for use for group reporting only.) This measure is recommended for use for group reporting only. Minimal cancer rate is another indicator of the "earliness" of cancer detection. Unlike node negativity, it includes DCIS, but among invasive cancers it is limited to node negative tumors no larger than 10mm. Detecting a cancer when it is minimal alerts the patient about disease when it is curable, and provides the patient and treating physician more options for planning treatment as well as higher likelihood of positive outcome of treatment. When mammography is used for screening, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 15
Measure Title	Report Turnaround Time: Radiography (modified)

Measure Description	Mean radiography report turnaround time (RTAT). (Does not include mammography.) This measure has been harmonized with MSN QCDR.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Communicaton and Care Coordination
NQS Domain Rationale	The rationale for including this measure in the Communication and Care Coordination domain is based on the quality actions for the measure as shown below: Quality action for individual: timely response to treating clinician in order to optimize episode duration without compromising accuracy of interpretation. Quality action for group: optimize communication with treating/referring clinicians in order to optimize workflow and patient diagnosis/treatment.
Denominator	Total number of radiography exams completed
Denominator Data Elements	Exam modality or CPT/HCPCS Code or ICD-10 PCS Code; Date/time of exam completion
Denominator Exclusions	None
Denominator Exceptions	Records that have lowest 2.5% values, and highest 2.5% values of calculated measure, to eliminate outliers
Numerator	Mean time from exam completion to final signature on report, in hours
Numerator Excluions	None
Numerator Data Elements	Date/time of exam completion; Date/time of report signed
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Care Coordination
Outcome Measure	Yes

QCDR Measure	ACRad 15
Measure Title	Report Turnaround Time: Radiography (modified)

Inverse measure	Yes
Proportion Measure	No
Continuous Measure	Yes
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	0.00-8784.00
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (General Radiology Improvement Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2014. The written imaging report is a key method for providing diagnostic interpretation to referring clinicians from radiologists. Timely final imaging reports support informed and efficient decision making for treatment plans by referring physicians, and ultimately the delivery of care to patients. While important to timely treatment and potentially better health outcomes, short turnaround of reports also improves patients' experience with care, cuts input costs, and improves the throughput of imaging exams. Rapid turnaround time (TAT) of reports is especially important to patient care provided in the emergency department (ED). These measures encompass all settings, enabling quality improvement in each. While the definition of timeliness depends on setting or site characteristics, using comparative benchmarks from registry data provides radiologists with transparent feedback to optimize TAT at their sites. The American Board of Radiology includes "turnaround time" as one category from which radiologists may select to conduct a practice quality improvement (Part IV) for continued Maintenance of Certification. References: 1. ACR Practice Guideline for Communication of Diagnostic Imaging Findings http://www.acr.org/~/media/ACR/Documents/PGTS/guidelines/Comm_Diag_Imaging.pdf 2. Janet L. Strife, Larry E. Kun, Gary J. Becker, N. Reed Dunnick, Jennifer Bosma, Robert R. Hattery. The American Board of Radiology Perspective on Maintenance of Certification: Part IV—Practice Quality Improvement for Diagnostic Radiology Radiology, 2007,

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initiatives: decreasing variability in turnaround time for radiographic studies from the
emergency department. Radiographics. 2013 Mar-Apr;33(2):361-71. doi:
10.1148/rg.332125738. PubMed PMID: 23479701.

Rationale

(This measure is modified to exclude mammography, because mammography is clinically distinct from other kinds of radiography procedures - it is overwhelmingly performed for screening asymoptomatic patients.) The written imaging report is a key method for providing diagnostic interpretation to referring clinicians from radiologists. Timely final imaging reports support informed and efficient decision making for treatment plans by referring physicians, and ultimately the delivery of care to patients. While important to timely treatment and potentially better health outcomes, short turnaround of reports also improves patients' experience with care, cuts input costs, and improves the throughput of imaging exams. Rapid turnaround time (TAT) of reports is especially important to patient care provided in the emergency department (ED). These measures encompass all settings, enabling quality improvement in each. While the definition of timeliness depends on setting or site characteristics, using comparative benchmarks from registry data provides radiologists with transparent feedback to optimize TAT at their sites. The American Board of Radiology includes "turnaround time" as one category from which radiologists may select to conduct a practice quality improvement (Part IV) for continued Maintenance of Certification. Additional information is provided

	in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 16
Measure Title	Report Turnaround Time: Ultrasound (Excluding Breast US)

Measure Description	Mean Ultrasound report turnaround time (RTAT) This measure has been harmonized with MSN QCDR.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Communicaton and Care Coordination
NQS Domain Rationale	The rationale for including this measure in the Communication and Care Coordination domain is based on the quality actions for the measure as shown below: Quality action for individual: timely response to treating clinician in order to optimize episode duration without compromising accuracy of interpretation. Quality action for group: optimize communication with treating/referring clinicians in order to optimize workflow and patient diagnosis/treatment.
Denominator	Total number of ultrasound exams completed (excluding breast Ultrasound)
Denominator Data Elements	Exam modality or CPT/HCPCS Code or ICD-10 PCS Code; Date/time of exam completion
Denominator Exclusions	None
Denominator Exceptions	Records that have lowest 2.5% values, and highest 2.5% values of calculated measure, to eliminate outliers
Numerator	Mean time from exam completion to final signature on report, in hours
Numerator Excluions	None
Numerator Data Elements	Date/time of exam completion; Date/time of report signed
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Care Coordination
Outcome Measure	Yes

Inverse measure	Yes
Proportion Measure	No
Continuous Measure	Yes
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	0.00-8784.00
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (General Radiology Improvement Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2014. The written imaging report is a key method for providing diagnostic interpretation to referring clinicians from radiologists. Timely final imaging reports support informed and efficient decision making for treatment plans by referring physicians, and ultimately the delivery of care to patients. While important to timely treatment and potentially better health outcomes, short turnaround of reports also improves patients' experience with care, cuts input costs, and improves the throughput of imaging exams. Rapid turnaround time (TAT) of reports is especially important to patient care provided in the emergency department (ED). These measures encompass all settings, enabling quality improvement in each. While the definition of timeliness depends on setting or site characteristics, using comparative benchmarks from registry data provides radiologists with transparent feedback to optimize TAT at their sites. The American Board of Radiology includes "turnaround time" as one category from which radiologists may select to conduct a practice quality improvement (Part IV) for continued Maintenance of Certification. References: 1. ACR Practice Guideline for Communication of Diagnostic Imaging Findings http://www.acr.org/~/media/ACR/Documents/PGTS/guidelines/Comm_Diag_Imaging.pdf 2. Janet L. Strife, Larry E. Kun, Gary J. Becker, N. Reed Dunnick, Jennifer Bosma, Robert R. Hattery. The American Board of Radiology Perspective on Maintenance of Certification: Part IV—Practice Quality Improvement for Diagnostic Radiology Radiology, 2007,

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initiatives: decreasing variability in turnaround time for radiographic studies from the
emergency department. Radiographics. 2013 Mar-Apr;33(2):361-71. doi:
10.1148/rg.332125738. PubMed PMID: 23479701.

Rationale	The written imaging report is a key method for providing diagnostic interpretation to referring clinicians from radiologists. Timely final imaging reports support informed and efficient decision making for treatment plans by referring physicians, and ultimately the delivery of care to patients. While important to timely treatment and potentially better health outcomes, short turnaround of reports also improves patients' experience with care, cuts input costs, and improves the throughput of imaging exams. Rapid turnaround time (TAT) of reports is especially important to patient care provided in the emergency department (ED). These measures encompass all settings, enabling quality improvement in each. While the definition of timeliness depends on setting or site characteristics, using comparative benchmarks from registry data provides radiologists with transparent feedback to optimize TAT at their sites. The American Board of Radiology includes "turnaround time" as one category from which radiologists may select to conduct a practice quality improvement (Part IV) for continued Maintenance of Certification. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology

QCDR Measure	ACRad 16
Measure Title	Report Turnaround Time: Ultrasound (Excluding Breast US)

Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 17
Measure Title	Report Turnaround Time: MRI

Measure Description	Mean MRI report turnaround time (RTAT) This measure has been harmonized with MSN QCDR.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Communicaton and Care Coordination
NQS Domain Rationale	The rationale for including this measure in the Communication and Care Coordination domain is based on the quality actions for the measure as shown below: Quality action for individual: timely response to treating clinician in order to optimize episode duration without compromising accuracy of interpretation. Quality action for group: optimize communication with treating/referring clinicians in order to optimize workflow and patient diagnosis/treatment.
Denominator	Total number of MRI exams completed
Denominator Data Elements	Exam modality or CPT/HCPCS Code or ICD-10 PCS Code; Date/time of exam completion
Denominator Exclusions	None
Denominator Exceptions	Records that have lowest 2.5% values, and highest 2.5% values of calculated measure, to eliminate outliers
Numerator	Mean time from exam completion to final signature on report, in hours
Numerator Excluions	None
Numerator Data Elements	Date/time of exam completion; Date/time of report signed
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Care Coordination
Outcome Measure	Yes
Inverse measure	Yes

QCDR Measure	ACRad 17
Measure Title	Report Turnaround Time: MRI

Proportion Measure	No
Continuous Measure	Yes
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	0.00-8784.00
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (General Radiology Improvement Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2014. The written imaging report is a key method for providing diagnostic interpretation to referring clinicians from radiologists. Timely final imaging reports support informed and efficient decision making for treatment plans by referring physicians, and ultimately the delivery of care to patients. While important to timely treatment and potentially better health outcomes, short turnaround of reports also improves patients' experience with care, cuts input costs, and improves the throughput of imaging exams. Rapid turnaround time (TAT) of reports is especially important to patient care provided in the emergency department (ED). These measures encompass all settings, enabling quality improvement in each. While the definition of timeliness depends on setting or site characteristics, using comparative benchmarks from registry data provides radiologists with transparent feedback to optimize TAT at their sites. The American Board of Radiology includes "turnaround time" as one category from which radiologists may select to conduct a practice quality improvement (Part IV) for continued Maintenance of Certification. References: 1. ACR Practice Guideline for Communication of Diagnostic Imaging Findings http://www.acr.org/~/media/ACR/Documents/PGTS/guidelines/Comm_Diag_Imaging.pdf 2. Janet L. Strife, Larry E. Kun, Gary J. Becker, N. Reed Dunnick, Jennifer Bosma, Robert R. Hattery. The American Board of Radiology Perspective on Maintenance of Certification: Part IV—Practice Quality Improvement for Diagnostic Radiology Radiology, 2007, Vol.243: 309- 313, 10.1148/radiol.2432061954

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initiatives: decreasing variability in turnaround time for radiographic studies from the
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Rationale	The written imaging report is a key method for providing diagnostic interpretation to referring clinicians from radiologists. Timely final imaging reports support informed and efficient decision making for treatment plans by referring physicians, and ultimately the delivery of care to patients. While important to timely treatment and potentially better health outcomes, short turnaround of reports also improves patients' experience with care, cuts input costs, and improves the throughput of imaging exams. Rapid turnaround time (TAT) of reports is especially important to patient care provided in the emergency department (ED). These measures encompass all settings, enabling quality improvement in each. While the definition of timeliness depends on setting or site characteristics, using comparative benchmarks from registry data provides radiologists with transparent feedback to optimize TAT at their sites. The American Board of Radiology includes "turnaround time" as one category from which radiologists may select to conduct a practice quality improvement (Part IV) for continued Maintenance of Certification. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 17
Measure Title	Report Turnaround Time: MRI

QCDR Measure	ACRad 18
Measure Title	Report Turnaround Time: CT

Measure Description	Mean CT report turnaround time (RTAT) This measure has been harmonized with MSN QCDR.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Communicaton and Care Coordination
NQS Domain Rationale	The rationale for including this measure in the Communication and Care Coordination domain is based on the quality actions for the measure as shown below: Quality action for individual: timely response to treating clinician in order to optimize episode duration without compromising accuracy of interpretation. Quality action for group: optimize communication with treating/referring clinicians in order to optimize workflow and patient diagnosis/treatment.
Denominator	Total number of CT exams completed
Denominator Data Elements	Exam modality or CPT/HCPCS Code or ICD-10 PCS Code; Date/time of exam completion
Denominator Exclusions	None
Denominator Exceptions	Records that have lowest 2.5% values, and highest 2.5% values of calculated measure, to eliminate outliers
Numerator	Mean time from exam completion to final signature on report, in hours
Numerator Excluions	None
Numerator Data Elements	Date/time of exam completion; Date/time of report signed
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Care Coordination
Outcome Measure	Yes
Inverse measure	Yes

QCDR Measure	ACRad 18
Measure Title	Report Turnaround Time: CT

Proportion Measure	No
Continuous Measure	Yes
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	0.00-8784.00
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (General Radiology Improvement Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2014. The written imaging report is a key method for providing diagnostic interpretation to referring clinicians from radiologists. Timely final imaging reports support informed and efficient decision making for treatment plans by referring physicians, and ultimately the delivery of care to patients. While important to timely treatment and potentially better health outcomes, short turnaround of reports also improves patients' experience with care, cuts input costs, and improves the throughput of imaging exams. Rapid turnaround time (TAT) of reports is especially important to patient care provided in the emergency department (ED). These measures encompass all settings, enabling quality improvement in each. While the definition of timeliness depends on setting or site characteristics, using comparative benchmarks from registry data provides radiologists with transparent feedback to optimize TAT at their sites. The American Board of Radiology includes "turnaround time" as one category from which radiologists may select to conduct a practice quality improvement (Part IV) for continued Maintenance of Certification. References: 1. ACR Practice Guideline for Communication of Diagnostic Imaging Findings http://www.acr.org/~/media/ACR/Documents/PGTS/guidelines/Comm_Diag_Imaging.pdf 2. Janet L. Strife, Larry E. Kun, Gary J. Becker, N. Reed Dunnick, Jennifer Bosma, Robert R. Hattery. The American Board of Radiology Perspective on Maintenance of Certification: Part IV—Practice Quality Improvement for Diagnostic Radiology Radiology, 2007, Vol.243: 309- 313, 10.1148/radiol.2432061954

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emergency department. Radiographics. 2013 Mar-Apr;33(2):361-71. doi:
10.1148/rg.332125738. PubMed PMID: 23479701.

Rationale	The written imaging report is a key method for providing diagnostic interpretation to referring clinicians from radiologists. Timely final imaging reports support informed and efficient decision making for treatment plans by referring physicians, and ultimately the delivery of care to patients. While important to timely treatment and potentially better health outcomes, short turnaround of reports also improves patients' experience with care, cuts input costs, and improves the throughput of imaging exams. Rapid turnaround time (TAT) of reports is especially important to patient care provided in the emergency department (ED). These measures encompass all settings, enabling quality improvement in each. While the definition of timeliness depends on setting or site characteristics, using comparative benchmarks from registry data provides radiologists with transparent feedback to optimize TAT at their sites. The American Board of Radiology includes "turnaround time" as one category from which radiologists may select to conduct a practice quality improvement (Part IV) for continued Maintenance of Certification. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 18
Measure Title	Report Turnaround Time: CT

QCDR Measure	ACRad 19
Measure Title	Report Turnaround Time: PET

Measure Description	Mean PET report turnaround time (RTAT) This measure has been harmonized with MSN QCDR.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Communicaton and Care Coordination
NQS Domain Rationale	The rationale for including this measure in the Communication and Care Coordination domain is based on the quality actions for the measure as shown below: Quality action for individual: timely response to treating clinician in order to optimize episode duration without compromising accuracy of interpretation. Quality action for group: optimize communication with treating/referring clinicians in order to optimize workflow and patient diagnosis/treatment.
Denominator	Total number of PET exams completed
Denominator Data Elements	Exam modality or CPT/HCPCS Code or ICD-10 PCS Code; Date/time of exam completion
Denominator Exclusions	None
Denominator Exceptions	Records that have lowest 2.5% values, and highest 2.5% values of calculated measure, to eliminate outliers
Numerator	Mean time from exam completion to final signature on report, in hours
Numerator Excluions	None
Numerator Data Elements	Date/time of exam completion; Date/time of report signed
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Care Coordination
Outcome Measure	Yes
Inverse measure	Yes

QCDR Measure	ACRad 19
Measure Title	Report Turnaround Time: PET

Proportion Measure	No
Continuous Measure	Yes
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	0.00-8784.00
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (General Radiology Improvement Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2014. The written imaging report is a key method for providing diagnostic interpretation to referring clinicians from radiologists. Timely final imaging reports support informed and efficient decision making for treatment plans by referring physicians, and ultimately the delivery of care to patients. While important to timely treatment and potentially better health outcomes, short turnaround of reports also improves patients' experience with care, cuts input costs, and improves the throughput of imaging exams. Rapid turnaround time (TAT) of reports is especially important to patient care provided in the emergency department (ED). These measures encompass all settings, enabling quality improvement in each. While the definition of timeliness depends on setting or site characteristics, using comparative benchmarks from registry data provides radiologists with transparent feedback to optimize TAT at their sites. The American Board of Radiology includes "turnaround time" as one category from which radiologists may select to conduct a practice quality improvement (Part IV) for continued Maintenance of Certification. References: 1. ACR Practice Guideline for Communication of Diagnostic Imaging Findings http://www.acr.org/~/media/ACR/Documents/PGTS/guidelines/Comm_Diag_Imaging.pdf 2. Janet L. Strife, Larry E. Kun, Gary J. Becker, N. Reed Dunnick, Jennifer Bosma, Robert R. Hattery. The American Board of Radiology Perspective on Maintenance of Certification: Part IV—Practice Quality Improvement for Diagnostic Radiology Radiology, 2007, Vol.243: 309- 313, 10.1148/radiol.2432061954

3. Kruskal JB, Anderson S, Yam CS, Sosna J. Strategies for establishing a comprehensive quality
and performance improvement program in a radiology department. Radiographics. 2009
Mar- Apr;29(2):315-29. doi: 10.114 /rg.292085090. Epub 2009 Jan 23. PubMed PMID:
19168762.
4. Reiner BI. The challenges, opportunities, and imperative of structured reporting in medical
imaging. J Digit Imaging. 2009 Dec;22(6):562-8. doi: 10.1007/s10278-009-9239-z. Review.
PubMed PMID: 19816742; PubMed Central PMCID:PMC2782125.
5. Swensen SJ, Johnson CD. Radiology quality and safety: mapping value into radiology. J Am
Coll Radiol 2005;2:992-1000.
6. Towbin AJ, Iyer SB, Brown J, Varadarajan K, Perry LA, Larson DB. Practice policy and quality
initiatives: decreasing variability in turnaround time for radiographic studies from the
emergency department. Radiographics. 2013 Mar-Apr;33(2):361-71. doi:
10.1148/rg.332125738. PubMed PMID: 23479701.

Rationale	The written imaging report is a key method for providing diagnostic interpretation to referring clinicians from radiologists. Timely final imaging reports support informed and efficient decision making for treatment plans by referring physicians, and ultimately the delivery of care to patients. While important to timely treatment and potentially better health outcomes, short turnaround of reports also improves patients' experience with care, cuts input costs, and improves the throughput of imaging exams. Rapid turnaround time (TAT) of reports is especially important to patient care provided in the emergency department (ED). These measures encompass all settings, enabling quality improvement in each. While the definition of timeliness depends on setting or site characteristics, using comparative benchmarks from registry data provides radiologists with transparent feedback to optimize TAT at their sites. The American Board of Radiology includes "turnaround time" as one category from which radiologists may select to conduct a practice quality improvement (Part IV) for continued Maintenance of Certification. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 19
Measure Title	Report Turnaround Time: PET

Measure Description	The percentage of screenings of lung cancer that were interpreted as positive (Lung-RADS category 3 or 4) and result in a tissue diagnosis of cancer within 12 months.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Effective Clinical Care
NQS Domain Rationale	The rationale for including this measure in the Effective Clinical Care domain is based on the quality action of the measure as shown below: Quality action for provider: Improve own diagnostic performance and participate in ongoing training to ensure that no cancers are missed. Positive findings on screening are infrequent and may be easy to miss without adequate vigilance or training. Quality action for group: Monitor one another's performance and ensure that a group has adequate processes and training to ensure an effective screening program.
Denominator	Number of screening exams
Denominator Data Elements	Date of screening exam
Denominator Exclusions	None
Denominator Exceptions	None
Numerator	Number of screening exams that had a Lung-RADS assessment category of 3 or 4 and a tissue diagnosis of cancer within 12 months. (Tissue diagnosis field = 2, 4 or 5)
Numerator Excluions	None
Numerator Data Elements	Date of tissue diagnosis; Date of screening exam; Tissue diagnosis; CT exam result by Lung-RADS category
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Not applicable

QCDR Measure	ACRad 21
Measure Title	Lung Cancer Screening Cancer Detection Rate (CDR)

Outcome Measure	No
Inverse measure	No
Proportion Measure	Yes
Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (Lung Cancer Screening Registry)
Evidence	This measure was approved by CMS for QCDR inclusion in 2015. Cancer detection is the primary goal of lung screening. A high cancer detection rate is indicative of patient receiving effective screening, where positive findings on imaging are highly likely to be confirmed as malignant disease by pathology results. Because this is a screening procedure, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Lung cancer is the leading cause of cancer for both men and women, with more than 156,000 patients dying from lung cancer each year in the United States, a figure that is greater than the mortality rates of breast, prostate, and colon cancer combined. Furthermore, lung cancer is the leading cause of cancer death in every racial and ethnic subgroup, and is the leading cancer killer of women, taking more lives than breast and every gynecological cancer combined. Lung cancer screening (LCS) with low dose computed tomography (LDCT) is the only procedure proven to reduce lung cancer mortality in individuals at high-risk for lung cancer, and does so cost effectively. A clinical practice registry is essential to ensure that screening is performed in general clinical practice at a high level of quality that can replicate the results found in research without undue risk. The measures included in the registry monitor cancer detection rate and positive predictive value to guide physicians towards low false positive rates and screening of the appropriate population, and radiation dose indices to ensure that radiation exposure to this screening population is no higher than necessary. Measures

	related to imaging interpretation are based on Lung-RADS, a set of structured assessment categories for reporting on lung cancer screening. References: 1. Aberle DR, Adams AM, Berg CD, Black WC, Clapp JD, Fagerstrom RM, Gareen IF, Gatsonis C, Marcus PM, Sicks JD. Reduced lung-cancer mortality with low-dose computed tomographic screening. N Engl J Med. 2011 Aug 4;365(5):395-409. doi: 10.1056/NEJMoa1102873. Epub 2011 Jun 29. 2. Pinsky PF, Gierada DS, Hocking W, Patz EF, Kramer BS. National Lung Screening Trial Findings by Age: Medicare-Eligible Versus Under-65 Population. Annals of Internal Medicine 2014; doi:10.7326/M14- 1484 http://annals.org/article.aspx?articleid=1902271 3. Black WC, Gareen IF, Soneji SS, Sicks JD, Keeler EB, Aberle DR, Naeim A, Church TR, Silvestri GA, Gorelick J, Gatsonis Cost-Effectiveness of CT Screening; N Engl J Med 2014; 371:1793- 1802; http://www.nejm.org/doi/full/10.1056/NEJMoa1312547 4. McKee BJ, Regis SM, McKee AB, Flacke S, Wald C. Performance of ACR Lung-RADS™ in a Clinical CT Lung Screening Program. Journal of the American College of Radiology 2014; http://dx.doi.org/10.1016/j.jacr.2014.08.004 5. American Association of Physicists in Medicine, Protocols for Lung Cancer Screening. Accessed 08/18/14. http://www.aapm.org/pubs/CTProtocols/?tab=5#CTPanel
Rationale	Cancer detection is the primary goal of lung screening. A high cancer detection rate is indicative of patient receiving effective screening, where positive findings on imaging are highly likely to be confirmed as malignant disease by pathology results. Because this is a screening procedure, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 22
Measure Title	Lung Cancer Screening Positive Predictive Value (PPV)

Measure Description	The percentage of screenings for lung cancer with abnormal interpretation (Lung-RADS 3 or 4) that result in a tissue diagnosis of cancer within 12 months.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Effective Clinical Care
NQS Domain Rationale	The rationale for including this measure in the Effective Clinical Care domain is based on the quality action for the measure as shown below: Quality action for provider: Improve own diagnostic performance and only call an exam positive if it indicates a high probability of cancer. Quality action for group: Monitor one another's performance and ensure that a group has adequate processes and training to ensure that a high percent of exams found to be positive on imaging are also positive on tissue diagnosis.
Denominator	Number of screening exams with a Lung-RADS assessment category of 3 or 4
Denominator Data Elements	Date of screening exam; CT exam result by Lung-RADS category
Denominator Exclusions	None
Denominator Exceptions	None
Numerator	Number of screening exams with a Lung-RADS assessment category of 3 or 4 that had a tissue diagnosis of cancer within 12 months. (Tissue diagnosis field = 2, 4 or 5)
Numerator Excluions	None
Numerator Data Elements	Date of Tissue Diagnosis; Date of screening exam; Tissue diagnosis; CT exam result by Lung-RADS category
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Not applicable

QCDR Measure	ACRad 22
Measure Title	Lung Cancer Screening Positive Predictive Value (PPV)

Outcome Measure	No
Inverse measure	No
Proportion Measure	Yes
Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (Lung Cancer Screening Registry)
Evidence	This measure was approved by CMS for QCDR inclusion in 2015. PPV2 is a useful approximation of the other type of false-positive outcome (biopsy with benign diagnosis). A high true positive rate is indicative of patient receiving the most clinically appropriate care. Because this is a screening procedure, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Additional information is provided in Appendix. Lung cancer is the leading cause of cancer for both men and women, with more than 156,000 patients dying from lung cancer each year in the United States, a figure that is greater than the mortality rates of breast, prostate, and colon cancer combined. Furthermore, lung cancer is the leading cause of cancer death in every racial and ethnic subgroup, and is the leading cancer killer of women, taking more lives than breast and every gynecological cancer combined. Lung cancer screening (LCS) with low dose computed tomography (LDCT) is the only procedure proven to reduce lung cancer mortality in individuals at high-risk for lung cancer, and does so cost effectively. A clinical practice registry is essential to ensure that screening is performed in general clinical practice at a high level of quality that can replicate the results found in research without undue risk. The measures included in the registry monitor cancer detection rate and positive predictive value to guide physicians towards low false positive rates and screening of the appropriate population, and radiation dose indices to ensure that radiation exposure to this screening population is no higher than necessary. Measures

	related to imaging interpretation are based on Lung-RADS, a set of structured assessment categories for reporting on lung cancer screening. References: 1. Aberle DR, Adams AM, Berg CD, Black WC, Clapp JD, Fagerstrom RM, Gareen IF, Gatsonis C, Marcus PM, Sicks JD. Reduced lung-cancer mortality with low-dose computed tomographic screening. N Engl J Med. 2011 Aug 4;365(5):395-409. doi: 10.1056/NEJMoa1102873. Epub 2011 Jun 29. 2. Pinsky PF, Gierada DS, Hocking W, Patz EF, Kramer BS. National Lung Screening Trial Findings by Age: Medicare-Eligible Versus Under-65 Population. Annals of Internal Medicine 2014; doi:10.7326/M14- 1484 http://annals.org/article.aspx?articleid=1902271 3. Black WC, Gareen IF, Soneji SS, Sicks JD, Keeler EB, Aberle DR, Naeim A, Church TR, Silvestri GA, Gorelick J, Gatsonis Cost-Effectiveness of CT Screening; N Engl J Med 2014; 371:1793- 1802; http://www.nejm.org/doi/full/10.1056/NEJMoa1312547 4. McKee BJ, Regis SM, McKee AB, Flacke S, Wald C. Performance of ACR Lung-RADS™ in a Clinical CT Lung Screening Program. Journal of the American College of Radiology 2014; http://dx.doi.org/10.1016/j.jacr.2014.08.004 5. American Association of Physicists in Medicine, Protocols for Lung Cancer Screening. Accessed 08/18/14. http://www.aapm.org/pubs/CTProtocols/?tab=5#CTPanel
Rationale	(This measure was discussed with CMS and is being submitted following that discussion.) PPV2 is a useful approximation of the other type of false-positive outcome (biopsy with benign diagnosis). A high true positive rate is indicative of patient receiving the most clinically appropriate care. Because this is a screening procedure, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 23
Measure Title	Lung Cancer Screening Abnormal Interpretation Rate

Measure Description	The percentage of screening lung cancer interpreted as positive (Lung-RADS Category 3 or 4).
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Efficiency and Cost
NQS Domain Rationale	The rationale for including this measure in the Efficiency and Cost domain is based on the quality action for the measure as shown below: Quality action for provider: Improve own diagnostic performance and only call an exam positive if it indicates a high probability of cancer. Quality action for group: Monitor one another's performance and ensure that a group has adequate processes and training to ensure that a high percent of exams found to be positive on imaging are also positive on tissue diagnosis.
Denominator	Number of screening exams
Denominator Data Elements	Date of screening exam
Denominator Exclusions	None
Denominator Exceptions	None
Numerator	Number of screening exams with a Lung-RADS assessment category of 3 or 4
Numerator Excluions	None
Numerator Data Elements	CT exam result by Lung-RADS category
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Efficiency
Outcome Measure	No
Inverse measure	Yes

QCDR Measure	ACRad 23
Measure Title	Lung Cancer Screening Abnormal Interpretation Rate

Proportion Measure	Yes
Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (Lung Cancer Screening Registry)
Evidence	This measure was approved by CMS for QCDR inclusion in 2015. Abnormal interpretation rate or recall rate is a useful approximation of one type of false-positive outcome (recall at screening, not necessarily leading to biopsy). A high recall rate results in the patient potentially receiving unnecessary follow up imaging and biopsy. Because this is a screening procedure, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Additional information is provided in Appendix. Lung cancer is the leading cause of cancer for both men and women, with more than 156,000 patients dying from lung cancer each year in the United States, a figure that is greater than the mortality rates of breast, prostate, and colon cancer combined. Furthermore, lung cancer is the leading cause of cancer death in every racial and ethnic subgroup, and is the leading cancer killer of women, taking more lives than breast and every gynecological cancer combined. Lung cancer screening (LCS) with low dose computed tomography (LDCT) is the only procedure proven to reduce lung cancer mortality in individuals at high-risk for lung cancer, and does so cost effectively. A clinical practice registry is essential to ensure that screening is performed in general clinical practice at a high level of quality that can replicate the results found in research without undue risk. The measures included in the registry monitor cancer detection rate and positive predictive value to guide physicians towards low false positive rates and screening of the appropriate population, and radiation dose indices to ensure that radiation exposure to this screening population is no higher than necessary. Measures related to imaging interpretation are based on Lung-RADS, a set of structured assessment categories for reporting on lung

	cancer screening. References: 1. Aberle DR, Adams AM, Berg CD, Black WC, Clapp JD, Fagerstrom RM, Gareen IF, Gatsonis C, Marcus PM, Sicks JD. Reduced lung-cancer mortality with low-dose computed tomographic screening. N Engl J Med. 2011 Aug 4;365(5):395-409. doi: 10.1056/NEJMoa1102873. Epub 2011 Jun 29. 2. Pinsky PF, Gierada DS, Hocking W, Patz EF, Kramer BS. National Lung Screening Trial Findings by Age: Medicare-Eligible Versus Under-65 Population. Annals of Internal Medicine 2014; doi:10.7326/M14- 1484 http://annals.org/article.aspx?articleid=1902271 3. Black WC, Gareen IF, Soneji SS, Sicks JD, Keeler EB, Aberle DR, Naeim A, Church TR, Silvestri GA, Gorelick J, Gatsonis Cost-Effectiveness of CT Screening; N Engl J Med 2014; 371:1793- 1802; http://www.nejm.org/doi/full/10.1056/NEJMoa1312547 4. McKee BJ, Regis SM, McKee AB, Flacke S, Wald C. Performance of ACR Lung-RADS™ in a Clinical CT Lung Screening Program. Journal of the American College of Radiology 2014; http://dx.doi.org/10.1016/j.jacr.2014.08.004 5. American Association of Physicists in Medicine, Protocols for Lung Cancer Screening. Accessed 08/18/14. http://www.aapm.org/pubs/CTProtocols/?tab=5#CTPanel
Rationale	(This measure was discussed with CMS and is being submitted following that discussion.) Abnormal interpretation rate or recall rate is a useful approximation of one type of false-positive outcome (recall at screening, not necessarily leading to biopsy). A high recall rate results in the patient potentially receiving unnecessary follow up imaging and biopsy. Because this is a screening procedure, the patient population should be fairly similar between providers but we will work on risk adjustment models to ensure fair comparison. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 25
Measure Title	Report Turnaround Time: Mammography

Measure Description	Mean mammography report turnaround time (RTAT). This measure has been harmonized with MSN QCDR.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Communicaton and Care Coordination
NQS Domain Rationale	The rationale for including this measure in the Communication and Care Coordination domain is based on the quality actions for the measure as shown below: Quality action for individual: timely response to treating clinician in order to optimize episode duration without compromising accuracy of interpretation. Quality action for group: optimize communication with treating/referring clinicians in order to optimize workflow and patient diagnosis/treatment.
Denominator	Total number of mammography exams completed
Denominator Data Elements	Exam modality or CPT/HCPCS Code or ICD-10 PCS Code; Date/time of exam completion.
Denominator Exclusions	None
Denominator Exceptions	Records that have lowest 2.5% values, and highest 2.5% values of calculated measure, to eliminate outliers
Numerator	Mean time from exam completion to final signature on report, in hours
Numerator Excluions	None
Numerator Data Elements	Date/time of exam completion; Date/time of report signed
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Care Coordination
Outcome Measure	Yes
Inverse measure	Yes

QCDR Measure	ACRad 25
Measure Title	Report Turnaround Time: Mammography

Proportion Measure	No
Continuous Measure	Yes
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	0.00-8784.00
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (General Radiology Improvement Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2017. The written imaging report is a key method for providing diagnostic interpretation to referring clinicians from radiologists. Timely final imaging reports support informed and efficient decision making for treatment plans by referring physicians, and ultimately the delivery of care to patients. While important to timely treatment and potentially better health outcomes, short turnaround of reports also improves patients' experience with care, cuts input costs, and improves the throughput of imaging exams. Rapid turnaround time (TAT) of reports is especially important to patient care provided in the emergency department (ED). These measures encompass all settings, enabling quality improvement in each. While the definition of timeliness depends on setting or site characteristics, using comparative benchmarks from registry data provides radiologists with transparent feedback to optimize TAT at their sites. The American Board of Radiology includes "turnaround time" as one category from which radiologists may select to conduct a practice quality improvement (Part IV) for continued Maintenance of Certification. References: 1. ACR Practice Guideline for Communication of Diagnostic Imaging Findings http://www.acr.org/~/media/ACR/Documents/PGTS/guidelines/Comm_Diag_Imaging.pdf 2. Janet L. Strife, Larry E. Kun, Gary J. Becker, N. Reed Dunnick, Jennifer Bosma, Robert R. Hattery. The American Board of Radiology Perspective on Maintenance of Certification: Part IV—Practice Quality Improvement for Diagnostic Radiology Radiology, 2007, Vol.243: 309- 313, 10.1148/radiol.2432061954

	3. Kruskal JB, Anderson S, Yam CS, Sosna J. Strategies for establishing a comprehensive quality and performance improvement program in a radiology department. Radiographics. 2009 Mar- Apr;29(2):315-29. doi: 10.114 /rg.292085090. Epub 2009 Jan 23. PubMed PMID: 19168762. 4. Reiner BI. The challenges, opportunities, and imperative of structured reporting in medical imaging. J Digit Imaging. 2009 Dec;22(6):562-8. doi: 10.1007/s10278-009-9239-z. Review. PubMed PMID: 19816742; PubMed Central PMCID:PMC2782125. 5. Swensen SJ, Johnson CD. Radiology quality and safety: mapping value into radiology. J Am Coll Radiol 2005;2:992-1000. 6. Towbin AJ, Iyer SB, Brown J, Varadarajan K, Perry LA, Larson DB. Practice policy and quality initiatives: decreasing variability in turnaround time for radiographic studies from the emergency department. Radiographics. 2013 Mar-Apr;33(2):361-71. doi: 10.1148/rg.332125738. PubMed PMID: 23479701.
Rationale	The written imaging report is a key method for providing diagnostic interpretation to referring clinicians from radiologists. Timely final imaging reports support informed and efficient decision making for treatment plans by referring physicians, and ultimately the delivery of care to patients. While important to timely treatment and potentially better health outcomes, short turnaround of reports also improves patients' experience with care, cuts input costs, and improves the throughput of imaging exams. Rapid turnaround time (TAT) of reports is especially important to patient care provided in the emergency department (ED). These measures encompass all settings, enabling quality improvement in each. While the definition of timeliness depends on setting or site characteristics, using comparative benchmarks from registry data provides radiologists with transparent feedback to optimize TAT at their sites. The American Board of Radiology includes "turnaround time" as one category from which radiologists may select to conduct a practice quality improvement (Part IV) for continued Maintenance of Certification. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 25
Measure Title	Report Turnaround Time: Mammography

QCDR Measure	ACRad 26
Measure Title	Appropriate venous access for hemodialysis

Measure Description	Percentage of patients undergoing tunneled (long-term) catheter access for hemodialysis via subclavian access as compared to internal jugular access
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Patient Safety
NQS Domain Rationale	The rationale for including this measure in the Patient Safety domain is based on the measure quality action as shown below: Quality action: use of evidenced-based protocols for promoting patient safety such as placing catheters for hemodialysis into certain veins reduce the risk of injury or infection and potential for surgical repair.
Denominator	Number of patients receiving tunneled hemodialysis catheters placed via the upper body (internal jugular, external jugular/other collateral veins or subclavian veins)
Denominator Data Elements	Vein Accessed
Denominator Exclusions	None
Denominator Exceptions	Patients with occlusion of the internal jugular veins
Numerator	Number of patients who underwent placement of tunneled catheters for dialysis via the subclavian veins.
Numerator Excluions	None
Numerator Data Elements	Vein Accessed
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Process
High Priority Measure	Patient Safety
Outcome Measure	No
Inverse measure	Yes
Proportion Measure	Yes

QCDR Measure	ACRad 26
Measure Title	Appropriate venous access for hemodialysis

Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (SIR Structured Reports)
Evidence	This measure was approved by CMS for QCDR inclusion in 2017. Tunneled catheter access is a well-established technique to achieve or bridge patients to hemodialysis via an arteriovenous fistula or graft. The preferred access site for long-term catheter access via the upper torso is the lower internal jugular veins. Catheters placed via the subclavian vein experience repetitive shear-type torsion which has resulted in catheter fracture and embolization. In addition, catheter placement in this location increases the likelihood of chronic injury to the subclavian vein, which is difficult to treat both surgically or endovascularly. Hence, it is preferable to place tunneled hemodialysis catheters via the lower internal jugular veins, or into a collateral vein draining into the subclavian-internal jugular confluence when possible. This measure addresses an important gap among the multiple measures available for renal disease patients. The wide-spread availability of ultrasound for vascular access guidance across specialties has made placement of catheters via the lower internal jugular veins a uniformly safe procedure (6). This access site should be used uniformly to establish durable vascular access in patients requiring hemodialysis who are being worked up for fistula creation or graft placement or in whom such access is contraindicated (7). References: 1. KDOQI Guidelines 2006. Guideline 2.4.1, Page 250. 2. Vanholder R, Ringoir S: Vascular access for hemodialysis. Artificial Organs 18:263-264, 1994. 3. Schillinger F, Schillinger D, Montagnac R, Milcent T: Post catheterization vein stenosis in haemodialysis: Comparative angiographic study of 50 subclavian and 50 internal jugular accesses. Nephrol Dial Transplant 6: 722-724, 1991. 4. Kamran T, Zaheer K, Khan AA, Khalid M, Akhtar MS: Applications and complications of

	subclavian vein catheterization for hemodialysis. J Coll Physicians Surg Pak 13:40-43, 2003. 5. Schwab SJ, Quarles LD, Milddleton JP, et al. Hemodialysis-associated subclavian vein stenosis. Kidney Int 33:1156-1159, 1988. 6. Kidney Disease Outcomes Quality Initiative: 2006 Updates Clinical Practice Guidelines and Recommendations on Vascular Access 7. Dariushnia SR, Wallace MH, Siddiqi NH et. Al. Quality Improvement Guidelines for Central Venous Access. J Vasc Interv Radiol 2010; 21: 976-981
Rationale	Tunneled catheter access is a well-established technique to achieve or bridge patients to hemodialysis via an arteriovenous fistula or graft. The preferred access site for long-term catheter access via the upper torso is the lower internal jugular veins. Catheters placed via the subclavian vein experience repetitive shear-type torsion which has resulted in catheter fracture and embolization. In addition, catheter placement in this location increases the likelihood of chronic injury to the subclavian vein, which is difficult to treat both surgically or endovascularly. Hence, it is preferable to place tunneled hemodialysis catheters via the lower internal jugular veins, or into a collateral vein draining into the subclavian-internal jugular confluence when possible.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	Society of Interventional Radiology

QCDR Measure	ACRad 28
Measure Title	Rate of early peristomal infection following fluoroscopically guided gastrostomy tube placement

Measure Description	Percentage of patients with peristomal gastrostomy infection no more than14 days following initial tube placement
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Patient Safety
NQS Domain Rationale	The rationale for including this measure in the Patient Safety domain is based on the measure quality action as shown below: Quality action: tracking peristomal infections emphasize the need to use antibiotic regimens to reduce infection rates.
Denominator	Number of patients undergoing primary fluoroscopically “push” type gastrostomy insertion or fluoroscopically guided “hybrid” gastrostomy insertion.
Denominator Data Elements	"# of completed Gastrostomy procecedures (i.e. number of reports for SIR_GI_GastrostomyPull1.0 and SIR_GI_GastrostomyPush1.0) up to 2 weeks before end of reporting year (to enable follow-up to be completed)Date of exam"
Denominator Exclusions	None
Denominator Exceptions	Evaluation:The patient returned on [date] for site evaluation/The patient did not return for site evaluation [exclusion for lost to follow-up]
Numerator	Number of patients with peristomal infections no more than 14 days following percutaneous gastrostomy insertion
Numerator Excluions	None
Numerator Data Elements	[Addendum fields] Evaluation Site Evaluation Site Description
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Patient Safety
Outcome Measure	Yes

QCDR Measure	ACRad 28
Measure Title	Rate of early peristomal infection following fluoroscopically guided gastrostomy tube placement

Inverse measure	Yes
Proportion Measure	Yes
Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (SIR Structured Reports)
Evidence	This measure was approved by CMS for QCDR inclusion in 2017. The incidence of peristomal infections is reported between 5.4-30% and as high as 45% in other series following “retrograde” fluoroscopically guided gastrostomy tube insertion. There is consensus that the use of prophylactic antibiotics is appropriate for “hybrid” fluoroscopically guided gastrostomy (using retrograde pull technique through oropharynx and esophagus); however, no such consensus has been reached for push-only (antegrade) fluoroscopically guided gastrostomy tube placement. Tracking peristomal infections will drive individual to consider altering their antibiotic regimens to achieve a lower infection rate than peers. References: 1. McClave SA, Chang WK. complications of enteral access. Gastrointest Endosc 2003; 58:739- 751. 2. Perona F, Castellazi G, Ge Iuliis A, Rizzo L. Percutaneous radiologic gastrostomy: a 12-year series. Gut Liver. 2010;4(Suppl 1):S44-9. 3. Venkatesan AM et al. Practice Guideline for Adult Antibiotic Prophylaxis during Vascular and Interventional Radiology Porcedures. J Vasc Interv Radiol 2010; 21:1611-30. 4. Lipp A, Lusardi G. Systemic antimicrobial prophylaxis for percutaneous endoscopic gastrostomy. Cochrane Database Syst Rev 2006;(4): CD005571. 5. Shastri YM, Hoepffner N, Tessmer A, Ackermann H, Schroeder O, Stein J. New introducer PEG gastropexy does not require prophylactic antibiotics: multicenter prospective randomized doubleblind placebo-controlled study. Gastrointest Endosc 2008; 67:620 – 628.

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Rationale	The incidence of peristomal infections is reported between 5.4-30% and as high as 45% in other series following "retrograde" fluoroscopically guided gastrostomy tube insertion. There is consensus that the use of prophylactic antibiotics is appropriate for "hybrid" fluoroscopically guided gastrostomy (using retrograde pull technique through oropharynx and esophagus); however, no such consensus has been reached for push-only (antegrade) fluoroscopically guided gastrostomy tube placement. Tracking peristomal infections will drive individual to consider altering their antibiotic regimens to achieve a lower infection rate than peers.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	Society of Interventional Radiology

QCDR Measure	ACRad 29
Measure Title	Rate of percutaneous nephrostomy tube replacement within 30 days secondary to dislodgement

Measure Description	Percentage of percutaneous nephrostomy tube replacement within 30 days following initial placement.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Patient Safety
NQS Domain Rationale	The rationale for including this measure in the Patient Safety domain is based on the measure quality action as shown below: Quality action: Use evidence-based tube securing strategies known to reduce rate of catheter dislodgement.
Denominator	Number of percutaneous nephrostomy tubes placed primarily.
Denominator Data Elements	# of completed initial nephrostomy placement procedures AND Intervening Renal Procedure: Not Applicable/None/Unknown/Right Kidney [Specify]/Left Kidney [Specify]/Bilateral Kidneys [Specify] {part of all reports}
Denominator Exclusions	None
Denominator Exceptions	Patients undergoing an intervening procedure on the kidney. Malfunctioning tubes which are found to be appropriately positioned are included in the denominator but excluded from numerator; these tubes require exchange rather than replacement.
Numerator	Number of percutaneous nephrostomy tubes requiring replacement of a percutaneous nephrostomy tube secondary to dislodgement within 30 days of initial placement
Numerator Excluions	None
Numerator Data Elements	Pre-procedure Diagnosis
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome

QCDR Measure	ACRad 29
Measure Title	Rate of percutaneous nephrostomy tube replacement within 30 days secondary to dislodgement

High Priority Measure	Patient Safety
Outcome Measure	Yes
Inverse measure	Yes
Proportion Measure	Yes
Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (SIR Structured Reports)
Evidence	This measure was approved by CMS for QCDR inclusion in 2017. Replacement of percutaneous nephrostomy tubes that have become dislodged contributes to cost to the healthcare system and can lead to morbidity/mortality depending on the clinical scenario. Percutaneous nephrostomy catheters have an expected duration of 4-8 weeks depending on the clinical scenario; tubes are exchanged if long-term external drainage is required. Replacement of the tube once dislodged requires navigating an established tract (chronic) or a new percutaneous access (recently placed catheter). The rate of dislodgement has been reported from lessthan 1% in the early postplacement period to between 11 and 30% for longer duration catheters (1,2). Different securing strategies have been described in the literature and are known to reduce the rate of catheter dislodgement (3,4). Replacement of percutaneous nephrostomy tubes unnecessarily re-exposes patientsto the risks inherent with the initial tube placement (5). References: 1. Farrell TA et al. A review of radiologically guided percutaneous nephrostomies in 303 patients. JVIR 1997;14(9 pt 2): S277-S281. 2. Lee WJ et al. Emergency percutaneous nephrostomy: results and complications. JVIR 1994; 5(1):135-139. 3. Zhou T et al. Reinforcement for percutaneous nephrostomy tubes with a new technique. J Endourol. 2011;25(1):41-4.

	4. Bayne D et al. Determinants of nephrostomy tube dislodgement after percutaneous nephrolithotomy. J Endourol. 2015;(29)3:289-92. 5. Pabon-Ramos WM et al. Quality Improvement Guidelines for Percutaneous Nephrostomy. JVIR 2016; 27:410-414.
Rationale	Replacement of percutaneous nephrostomy tubes that have become dislodged contributes to cost to the healthcare system and can lead to morbidity/mortality depending on the clinical scenario. Percutaneous nephrostomy catheters have an expected duration of 4-8 weeks depending on the clinical scenario; tubes are exchanged if long-term external drainage is required. Replacement of the tube once dislodged requires navigating an established tract (chronic) or a new percutaneous access (recently placed catheter). The rate of dislodgement has been reported from less than 1% in the early postplacement period to between 11 and 30% for longer duration catheters. Different securing strategies have been described in the literature and are known to reduce the rate of catheter dislodgement. Replacement of percutaneous nephrostomy tubes unnecessarily re-exposes patients to the risks inherent with the initial tube placement.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	Society of Interventional Radiology

QCDR Measure	ACRad 30
Measure Title	Rate of Inadequate Percutaneous Image-Guided Biopsy

Measure Description	The percentage of percutaneous image-guided (US, CT, fluoro) biopsy procedures performed in which sampling was inadequate for diagnosis on the final pathology report.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Patient Safety
NQS Domain Rationale	The rationale for including this measure in the Patient Safety domain is based on the measure quality action as shown below: Quality action: work with on-site pathologists to enable cytopathologic review during biopsy. This ensures adequacy of sampling during a single procedure and reduces the risks associated with repeated biopsies.
Denominator	Number of percutaneous image-guided biopsies performed
Denominator Data Elements	Number of percutaneous biopsy procedure reports
Denominator Exclusions	None
Denominator Exceptions	Repeat biopsy procedures performed following an initial inadequate sample – excluded from numerator / denominator.
Numerator	Number of percutaneous image-guided biopsy procedures performed associated with a specimen sample considered inadequate for pathological analysis.
Numerator Excluions	None
Numerator Data Elements	Previous Biopsy
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Patient Safety
Outcome Measure	Yes
Inverse measure	Yes
Proportion Measure	Yes

Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (SIR Structured Reports)
Evidence	This measure was approved by CMS for QCDR inclusion in 2017. The success rate of percutaneous biopsy is determined by the suitability of the sample for pathological analysis. Patients in whom a biopsy procedure yields inadequate specimens for analysis may be referred for repeat percutaneous biopsy, open biopsy, or undergo imaging to assess for alternative sites for biopsy increasing costs to the system, necessitating a second procedure or imaging test, and resulting in a delay in diagnosis. This measure provides an overall assessment of effective biopsy sampling, which directly influences the patient experience and is an important component of efficient patient care. Evidence to support this measure comes from several published studies which were reviewed in a SIR Standards of Practice Document published in 2010 (1). The mean pooled success rates ranged from 70-96% for adequacy of sampling across a range of biopsy locations in 23 studies. The consensus panel suggested a threshold of 70-75% adequate sampling rate for internal quality improvement purposes. The proposed metric is intended not to penalize operators for attempting difficult percutaneous biopsies, but rather to place a priority on working with on-site pathologists to enable cytopathologic review during the biopsy procedure to ensure adequacy of sampling in a single procedure. References: 1. Gupta S, Wallace MJ, Cardella JF et al. Quality Improvement Guidelines for Percutaneous Needle Biopsy. JVIR 2010; 21:969=975
Rationale	The success rate of percutaneous biopsy is determined by the suitability of the sample for pathological analysis. Patients in whom a biopsy procedure yields inadequate specimens for analysis may be referred for repeat percutaneous biopsy, open biopsy, or undergo imaging to assess for alternative sites for biopsy increasing costs to the system, necessitating a second

	procedure or imaging test, and resulting in a delay in diagnosis. This measure provides an overall assessment of effective biopsy sampling, which directly influences the patient experience and is an important component of efficient patient care.Evidence to support this measure comes from several published studies which were reviewed in a SIR Standards of Practice Document published in 20101. The mean pooled success rates ranged from 70-96% for adequacy of sampling across a range of biopsy locations in 23 studies. The consensus panel suggested a threshold of 70-75% adequate sampling rate for internal quality improvement purposes. The proposed metric is intended not to penalize operators for attempting difficult percutaneous biopsies, but rather to place a priority on working with on-site pathologists to enable cytopathologic review during the biopsy procedure to ensure adequacy of sampling in a single procedure.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	Society of Interventional Radiology

QCDR Measure	ACRad 31
Measure Title	Percent of CT Abdomen-pelvis exams with contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level.

Measure Description	Percent of CT Abdomen-pelvis exams with contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level. Note: Calculated at facility/TIN level and assigned to all NPIs who read CT under that TIN.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Patient Safety
NQS Domain Rationale	The rationale for including this measure in the Patient Safety domain is based on the measure quality action as shown below: Quality action for a group: to implement and monitor CT protocols to ensure dose optimization.
Denominator	Number of CT Abdomen-pelvis exams with contrast (single phase scans)
Denominator Data Elements	Study description; Exam date; Acquisition protocol
Denominator Exclusions	None
Denominator Exceptions	None
Numerator	Number of CT Abdomen-pelvis exams with contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level.
Numerator Excluions	None
Numerator Data Elements	Dose length product; CTDIw Phantom Type; Effective Diameter (calculated from localizer image)
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Patient Safety
Outcome Measure	Yes
Inverse measure	No

QCDR Measure	ACRad 31
Measure Title	Percent of CT Abdomen-pelvis exams with contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level.

Proportion Measure	Yes
Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (Dose Index Registry Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2017. This measure is distinct from similar measures for head/brain and chest as these exams have different anatomic considerations, and are interpreted by different sub-specialists.) There has been a considerable rise in use of Computed Tomography (CT) over the past 10 years. With that, there is also a significant increase in the population's cumulative exposure to ionizing radiation. A CT study should use as little radiation as possible, while still meeting the image quality needs of the exam. Dose Length Product (DLP) is a standardized parameter to measure scanner radiation output to a patient and is a useful index to compare protocols across different practices and scanners. Providing comparative data across exam types to a physician or site will help adjust imaging protocols to obtain diagnostic images using the lowest reasonable dose. This measures the CT scanner radiation output specific to a patient and exam, comparing and benchmarking the actual dose index delivered to patients. While DLP itself is not a measure or estimate of actual patient radiation dose, it is closely related to doses received by patients. DLP is a measure of scanner output received and experienced by patients and not simply documentation of whether DLP was recorded. This measure is calculated at the facility level because protocol optimization is the combined effort of physicians, medical physicists and technologists in the practice, and change needs to be driven by the interpreting physicians as a team. Physicians see this information when interpreting an image and can participate actively with the rest of their team to manage the dose while maintaining diagnostic quality images. 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.

There are many challenges in dose monitoring, including collection of accurate data with minimal effort on the part of the facility, standardization of procedure names so that benchmarks can be applied appropriately, and adjustment for patient sizes. Dose registries would enable facilities to compare their radiation doses to those delivered in other facilities for the same exam, and such comparisons over time could assist in optimizing patient radiation doses for medical imaging. The goals of tracking imaging exams and the associated radiation exposure include: (1) providing information at the point-of-care for the referring practitioner (i.e. supporting justification); (2) promoting development and use of diagnostic reference levels (DRLs) (i.e. supporting optimization); (3) providing information for assessment of radiation risks; and (4) establishing a tool for use in research and epidemiology.

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Tomography Examinations and the Associated Lifetime Attributable Risk of Cancer. Arch Intern
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Tomography Examinations and the Associated Lifetime Attributable Risk of Cancer. Arch Intern
Med 2009; 169 (22)2078-2085.
7. Brody AS, Frush DP, Huda W, et al. Radiation risk to children from computed tomography.
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Levels and Achievable Doses for Ten Adult CT Examinations, Radiology, 2017, ahead of print.
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Rationale

(This measure was discussed with CMS and is a modification and consolidation of previous measures. This measure is distinct from similar measures for head/brain and chest as these exams have different anatomic considerations, and are interpreted by different sub-specialists.) There has been a considerable rise in use of Computed Tomography (CT) over the

	past 10 years. With that, there is also a significant increase in the population's cumulative exposure to ionizing radiation. A CT study should use as little radiation as possible, while still meeting the image quality needs of the exam. Dose Length Product (DLP) is a standardized parameter to measure scanner radiation output to a patient and is a useful index to compare protocols across different practices and scanners. Providing comparative data across exam types to a physician or site will help adjust imaging protocols to obtain diagnostic images using the lowest reasonable dose. This measures the CT scanner radiation output specific to a patient and exam, comparing and benchmarking the actual dose index delivered to patients. While DLP itself is not a measure or estimate of actual patient radiation dose, it is closely related to doses received by patients. DLP is a measure of scanner output received and experienced by patients and not simply documentation of whether DLP was recorded. This measure is calculated at the facility level because protocol optimization is the combined effort of physicians, medical physicists and technologists in the practice, and change needs to be driven by the interpreting physicians as a team. Physicians see this information when interpreting an image and can participate actively with the rest of their team to manage the dose while maintaining diagnostic quality images. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 32
Measure Title	Percent of CT Chest exams without contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level.

Measure Description	Percent of CT Chest exams without contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level. Note: Calculated at facility/TIN level and assigned to all NPIs who read CT under that TIN.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Patient Safety
NQS Domain Rationale	The rationale for including this measure in the Patient Safety domain is based on the measure quality action as shown below: Quality action for a group: to implement and monitor CT protocols to ensure dose optimization.
Denominator	Number of CT Chest exams without contrast (single phase scan)
Denominator Data Elements	Study description; Exam date; Acquisition protocol
Denominator Exclusions	None
Denominator Exceptions	None
Numerator	Number of CT Chest exams without contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level.
Numerator Excluions	None
Numerator Data Elements	Dose length product; CTDIw Phantom Type; Effective Diameter (calculated from localizer image)
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Patient Safety
Outcome Measure	Yes
Inverse measure	No
Proportion Measure	Yes

QCDR Measure	ACRad 32
Measure Title	Percent of CT Chest exams without contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level.

Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (Dose Index Registry Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2017. There has been a considerable rise in use of Computed Tomography (CT) over the past 10 years. With that, there is also a significant increase in the population's cumulative exposure to ionizing radiation. A CT study should use as little radiation as possible, while still meeting the image quality needs of the exam. Dose Length Product (DLP) is a standardized parameter to measure scanner radiation output to a patient and is a useful index to compare protocols across different practices and scanners. Providing comparative data across exam types to a physician or site will help adjust imaging protocols to obtain diagnostic images using the lowest reasonable dose. This measures the CT scanner radiation output specific to a patient and exam, comparing and benchmarking the actual dose index delivered to patients. While DLP itself is not a measure or estimate of actual patient radiation dose, it is closely related to doses received by patients. DLP is a measure of scanner output received and experienced by patients and not simply documentation of whether DLP was recorded. This measure is calculated at the facility level because protocol optimization is the combined effort of physicians, medical physicists and technologists in the practice, and change needs to be driven by the interpreting physicians as a team. Physicians see this information when interpreting an image and can participate actively with the rest of their team to manage the dose while maintaining diagnostic quality images. 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.

There are many challenges in dose monitoring, including collection of accurate data with minimal effort on the part of the facility, standardization of procedure names so that benchmarks can be applied appropriately, and adjustment for patient sizes. Dose registries would enable facilities to compare their radiation doses to those delivered in other facilities for the same exam, and such comparisons over time could assist in optimizing patient radiation doses for medical imaging. The goals of tracking imaging exams and the associated radiation exposure include: (1) providing information at the point-of-care for the referring practitioner (i.e. supporting justification); (2) promoting development and use of diagnostic reference levels (DRLs) (i.e. supporting optimization); (3) providing information for assessment of radiation risks; and (4) establishing a tool for use in research and epidemiology.

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Attributable Risk of Cancer. Arch Intern
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(http://pubs.rsna.org/doi/abs/10.1148/radiol.2017161911?journalCode=radiology)

Rationale

(This measure was discussed with CMS and is a modification and consolidation of previous measures. This measure is distinct from similar measures for head/brain and abdomen-pelvis as these exams have different anatomic considerations, and are interpreted by different sub-specialists.) There has been a considerable rise in use of Computed Tomography (CT) over the past 10 years. With that, there is also a significant increase in the population's cumulative exposure to ionizing radiation. A CT study should use as little radiation as possible, while still meeting the image quality needs of the exam. Dose Length Product (DLP) is a standardized parameter to measure

	scanner radiation output to a patient and is a useful index to compare protocols across different practices and scanners. Providing comparative data across exam types to a physician or site will help adjust imaging protocols to obtain diagnostic images using the lowest reasonable dose. This measures the CT scanner radiation output specific to a patient and exam, comparing and benchmarking the actual dose index delivered to patients. While DLP itself is not a measure or estimate of actual patient radiation dose, it is closely related to doses received by patients. DLP is a measure of scanner output received and experienced by patients and not simply documentation of whether DLP was recorded. This measure is calculated at the facility level because protocol optimization is the combined effort of physicians, medical physicists and technologists in the practice, and change needs to be driven by the interpreting physicians as a team. Physicians see this information when interpreting an image and can participate actively with the rest of their team to manage the dose while maintaining diagnostic quality images. Additional information is provided in Appendix.
Specialty/specialties this measure applies to	Radiology
Measure funding source (Steward)	American College of Radiology

QCDR Measure	ACRad 33
Measure Title	Percent of CT Head/Brain exams without contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level

Measure Description	Percent of CT Head/Brain exams without contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level. Note: Calculated at facility/TIN level and assigned to all NPIs who read CT under that TIN.
QCDR Measure Type	Existing QCDR Measure with No Changes
Does this measure belong to another QCDR? If so	No
NQF Number	
NQS Domain	Patient Safety
NQS Domain Rationale	The rationale for including this measure in the Patient Safety domain is based on the measure quality action as shown below: Quality action for a group: to implement and monitor CT protocols to ensure dose optimization.
Denominator	Number of CT Head/Brain exams without contrast (single phase scan)
Denominator Data Elements	Study description; Exam date; Acquisition protocol
Denominator Exclusions	None
Denominator Exceptions	None
Numerator	Number of CT Head/Brain exams without contrast (single phase scan) for which Dose Length Product is at or below the size-specific diagnostic reference level
Numerator Excluions	None
Numerator Data Elements	Dose length product; CTDIw Phantom Type; Effective Diameter (calculated from localizer image)
Number of performance rates to be submitted	1
Indicate an Overall Performance Rate if more tha	N/A
Measure Type (Process/Outcome)	Outcome
High Priority Measure	Patient Safety
Outcome Measure	Yes
Inverse measure	No

QCDR Measure	ACRad 33
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Proportion Measure	Yes
Continuous Measure	No
Ratio Measure	No
If Continuous or Ratio, what would be range of sc	N/A
Is the Measure Risk-Adjusted?	No
If risk-adjusted, which score is risk adjusted?	N/A
Data Source (Registry (<<which registry>>))	Registry (Dose Index Registry Database)
Evidence	This measure was approved by CMS for QCDR inclusion in 2017. There has been a considerable rise in use of Computed Tomography (CT) over the past 10 years. With that, there is also a significant increase in the population's cumulative exposure to ionizing radiation. A CT study should use as little radiation as possible, while still meeting the image quality needs of the exam. Dose Length Product (DLP) is a standardized parameter to measure scanner radiation output to a patient and is a useful index to compare protocols across different practices and scanners. Providing comparative data across exam types to a physician or site will help adjust imaging protocols to obtain diagnostic images using the lowest reasonable dose. This measures the CT scanner radiation output specific to a patient and exam, comparing and benchmarking the actual dose index delivered to patients. While DLP itself is not a measure or estimate of actual patient radiation dose, it is closely related to doses received by patients. DLP is a measure of scanner output received and experienced by patients and not simply documentation of whether DLP was recorded. This measure is calculated at the facility level because protocol optimization is the combined effort of physicians, medical physicists and technologists in the practice, and change needs to be driven by the interpreting physicians as a team. Physicians see this information when interpreting an image and can participate actively with the rest of their team to manage the dose while maintaining diagnostic quality images. 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.

There are many challenges in dose monitoring, including collection of accurate data with minimal effort on the part of the facility, standardization of procedure names so that benchmarks can be applied appropriately, and adjustment for patient sizes. Dose registries would enable facilities to compare their radiation doses to those delivered in other facilities for the same exam, and such comparisons over time could assist in optimizing patient radiation doses for medical imaging. The goals of tracking imaging exams and the associated radiation exposure include: (1) providing information at the point-of-care for the referring practitioner (i.e. supporting justification); (2) promoting development and use of diagnostic reference levels (DRLs) (i.e. supporting optimization); (3) providing information for assessment of radiation risks; and (4) establishing a tool for use in research and epidemiology.

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For more information, please visit the NRDR QCDR website.

www.acr.org/Quality-Safety/National-Radiology-Data-Registry/Qualified-Clinical-Data-Registry