

Stanford



Curtis Langlotz

Professor of Radiology (Thoracic Imaging) and of Medicine (Biomedical Informatics Research) at the Stanford University Medical Center

CLINICAL OFFICES

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ACADEMIC CONTACT INFORMATION

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Bio

BIO

Dr. Langlotz's laboratory investigates the use of deep neural networks and other machine learning technologies to help radiologists detect disease and eliminate diagnostic errors. His laboratory's translational approach facilitates rapid evaluation and dissemination of the resulting algorithms. He is responsible for the information technology that supports Stanford's radiology practice, including 6 million imaging studies that require 0.5 petabytes of storage.

Dr. Langlotz has led many recent national and international efforts to improve the quality of radiology communication, including the RadLex™ terminology standard, the RadLex™ Playbook of radiology exam codes, the RSNA report template library, and a technical standard for communication of radiology templates. He has published over 100 scholarly articles, and is author of the recent book "The Radiology Report: A Guide to Thoughtful Communication for Radiologists and Other Medical Professionals".

Raised in St. Paul, Minnesota, Dr. Langlotz received his undergraduate degree in Human Biology, masters in Computer Science, MD in Medicine, and PhD in Medical Information Science, all from Stanford University. He is a founder and past president of the Radiology Alliance for Health Services Research, served as chair of the Society for Imaging Informatics in Medicine (SIIM), and as a board member of the American Medical Informatics Association and the Association of University Radiologists. He is a fellow of the American College of Medical Informatics and currently serves as president of the College of SIIM Fellows and as a board member of the Radiological Society of North America.

He is a recipient of the Lee B. Lusted Research Prize from the Society of Medical Decision Making and the Career Achievement Award from the Radiology Alliance for Health Services Research. He has founded three healthcare information technology companies, most recently Montage Healthcare Solutions, which was acquired by Nuance Communications in 2016.

CLINICAL FOCUS

- Diagnostic Radiology

ACADEMIC APPOINTMENTS

- Professor - Med Center Line, Radiology

- Professor - Med Center Line, Medicine - Biomedical Informatics Research
- Member, Bio-X

ADMINISTRATIVE APPOINTMENTS

- Associate Chair for Information Systems, Department of Radiology, (2014- present)
- Medical Informatics Director for Radiology, Stanford Health Care, (2014- present)
- Director, Center for Artificial Intelligence in Medicine and Imaging, (2018- present)

HONORS AND AWARDS

- Lee B. Lusted Research Prize, Society for Medical Decision Making (1986)
- GERRAF Career Development Award, Association of University Radiologists (1993)
- Best Information Technology Company, New Jersey Technology Council (2001)
- Fellow, American College of Medical Informatics (2008)
- Fellow, Society for Imaging Informatics in Medicine (2010)
- Lifetime Achievement Award, Radiology Alliance for Health Services Research (2017)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Board of Directors, Radiological Society of North America (2016 - present)
- President, College of Imaging Informatics Fellows (2015 - 2018)
- President, Society for Imaging Informatics in Medicine (2006 - 2008)
- Board of Directors, Association for University Radiologists (2003 - 2010)
- Founder and President, Radiology Alliance for Health Services Research (2002 - 2004)
- Board of Trustees, Society for Medical Decision Making (1996 - 1998)

PROFESSIONAL EDUCATION

- Internship: Hospital of the University of Pennsylvania Primary Care PA
- AB, Stanford University , Human Biology (1981)
- MS, Stanford University , Computer Science: Artificial Intelligence (1983)
- MD, Stanford University , Medicine (1989)
- Medical Education: Stanford University, Medical School Registrar (1989) CA
- PhD, Stanford University , Medical Information Sciences (1989)
- Residency: Hospital of the University of Pennsylvania, Department of Radiology PA
- Board Certification: Diagnostic Radiology, American Board of Radiology (1994)

PATENTS

- Curtis Langlotz. "United States Patent 6,366,683 Apparatus and Method for Recording Image Analysis Information", Radiological Society of North America, Apr 2, 2002

LINKS

- Center for Artificial Intelligence in Medicine and Imaging: <https://aimi.stanford.edu/>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My laboratory employs deep neural networks and other machine learning technologies to design algorithms that detect and classify disease on medical images. We also develop natural language processing methods that use narrative radiology reports to create large annotated image training sets for supervised machine learning experiments. The resulting systems provide real-time decision support for radiologists to improve accuracy and reduce errors. We are committed to enabling the clinical use of ideas conceived in the laboratory. When our results show potential, we evaluate their utility in the reading room or the clinic and disseminate them as open source or commercial software.

CLINICAL TRIALS

- Validation of an Artificial Intelligence-based Algorithm for Skeletal Age Assessment, Recruiting

Teaching

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biomedical Informatics (Phd Program)
- Biomedical Informatics (Masters Program)
- Clinical Informatics (Fellowship Program)

Publications

PUBLICATIONS

- **Assessment of Convolutional Neural Networks for Automated Classification of Chest Radiographs.** *Radiology*
Dunnmon, J. A., Yi, D., Langlotz, C. P., Re, C., Rubin, D. L., Lungren, M. P.
2018; 181422
- **Cross-type Biomedical Named Entity Recognition with Deep Multi-Task Learning.** *Bioinformatics (Oxford, England)*
Wang, X., Zhang, Y., Ren, X., Zhang, Y., Zitnik, M., Shang, J., Langlotz, C., Han, J.
2018
- **Performance of a Deep-Learning Neural Network Model in Assessing Skeletal Maturity on Pediatric Hand Radiographs** *RADIOLOGY*
Larson, D. B., Chen, M. C., Lungren, M. P., Halabi, S. S., Stence, N. V., Langlotz, C. P.
2018; 287 (1): 313–22
- **Deep Learning to Classify Radiology Free-Text Reports** *RADIOLOGY*
Chen, M. C., Ball, R. L., Yang, L., Moradzadeh, N., Chapman, B. E., Larson, D. B., Langlotz, C. P., Amrhein, T. J., Lungren, M. P.
2018; 286 (3): 845–52
- **Expanding a radiology lexicon using contextual patterns in radiology reports.** *Journal of the American Medical Informatics Association : JAMIA*
Percha, B., Zhang, Y., Bozkurt, S., Rubin, D., Altman, R. B., Langlotz, C. P.
2018
- **Implications of Direct Patient Online Access to Radiology Reports Through Patient Web Portals** *JOURNAL OF THE AMERICAN COLLEGE OF RADIOLOGY*
Lee, C. I., Langlotz, C. P., Elmore, J. G.
2016; 13 (12): 1608-1614
- **Information extraction from multi-institutional radiology reports** *ARTIFICIAL INTELLIGENCE IN MEDICINE*
Hassanpour, S., Langlotz, C. P.
2016; 66: 29-39
- **The Radiology Report: A Guide to Thoughtful Communication for Radiologists and Other Medical Professionals (Book)**
Langlotz, C. P.

Amazon CreateSpace .2015

- **ACR BI-RADS for breast imaging communication: a roadmap for the rest of radiology.** *Journal of the American College of Radiology*
Langlotz, C. P.
2009; 6 (12): 861-863
- **Toward Best Practices in Radiology Reporting** *RADIOLOGY*
Kahn, C. E., Langlotz, C. P., Burnside, E. S., Carrino, J. A., Channin, D. S., Hovsepian, D. M., Rubin, D. L.
2009; 252 (3): 852-856
- **Fundamental measures of diagnostic examination performance: Usefulness for clinical decision making and research** *RADIOLOGY*
Langlotz, C. P.
2003; 228 (1): 3-9
- **A METHODOLOGY FOR GENERATING COMPUTER-BASED EXPLANATIONS OF DECISION-THEORETIC ADVICE** *MEDICAL DECISION MAKING*
Langlotz, C. P., Shortliffe, E. H., Fagan, L. M.
1988; 8 (4): 290-303
- **ADAPTING A CONSULTATION SYSTEM TO CRITIQUE USER PLANS** *INTERNATIONAL JOURNAL OF MAN-MACHINE STUDIES*
Langlotz, C. P., Shortliffe, E. H.
1983; 19 (5): 479-496
- **The LOINC RSNA radiology playbook - a unified terminology for radiology procedures** *JOURNAL OF THE AMERICAN MEDICAL INFORMATICS ASSOCIATION*
Vreeman, D. J., Abhyankar, S., Wang, K. C., Carr, C., Collins, B., Rubin, D. L., Langlotz, C. P.
2018; 25 (7): 885-92
- **Clinical decision support increases diagnostic yield of computed tomography for suspected pulmonary embolism** *AMERICAN JOURNAL OF EMERGENCY MEDICINE*
Mills, A. M., Ip, I. K., Langlotz, C. P., Raja, A. S., Zafar, H. M., Khorasani, R.
2018; 36 (4): 540-44
- **Deep Learning in Neuroradiology.** *AJNR. American journal of neuroradiology*
Zaharchuk, G., Gong, E., Wintermark, M., Rubin, D., Langlotz, C. P.
2018
- **Using Natural Language Processing of Free-Text Radiology Reports to Identify Type 1 Modic Endplate Changes** *JOURNAL OF DIGITAL IMAGING*
Huhdanpaa, H. T., Tan, W., Rundell, S. D., Suri, P., Chokshi, F. H., Comstock, B. A., Heagerty, P. J., James, K. T., Avins, A. L., Nedeljkovic, S. S., Nerenz, D. R., Kallmes, D. F., Luetmer, et al
2018; 31 (1): 84-90
- **Use of Radiology Procedure Codes in Health Care: The Need for Standardization and Structure** *RADIOGRAPHICS*
Wang, K. C., Patel, J. B., Vyas, B., Toland, M., Collins, B., Vreeman, D. J., Abhyankar, S., Siegel, E. L., Rubin, D. L., Langlotz, C. P.
2017; 37 (4): 1099-1110
- **Implementation of an Automated Radiology Recommendation-Tracking Engine for Abdominal Imaging Findings of Possible Cancer** *JOURNAL OF THE AMERICAN COLLEGE OF RADIOLOGY*
Cook, T. S., Lalevic, D., Sloan, C., Chadalavada, S. C., Langlotz, C. P., Schnall, M. D., Zafar, H. M.
2017; 14 (5): 629-636
- **Medicare Imaging Demonstration: Assessing Attributes of Appropriate Use Criteria and Their Influence on Ordering Behavior.** *AJR. American journal of roentgenology*
Lacson, R., Ip, I., Hentel, K. D., Malhotra, S., Balthazar, P., Langlotz, C. P., Raja, A. S., Khorasani, R.
2017: 1-7
- **JOURNAL CLUB: Predictors of Provider Response to Clinical Decision Support: Lessons Learned From the Medicare Imaging Demonstration.** *AJR. American journal of roentgenology*
Ip, I. K., Lacson, R., Hentel, K., Malhotra, S., Darer, J., Langlotz, C., Weiss, J., Raja, A. S., Khorasani, R.
2017; 208 (2): 351-357

- **Predictors of Provider Response to Clinical Decision Support: Lessons Learned From the Medicare Imaging Demonstration** *AMERICAN JOURNAL OF ROENTGENOLOGY*
Ip, I. K., Lacson, R., Hentel, K., Malhotra, S., Darer, J., Langlotz, C., Weiss, J., Raja, A. S., Khorasani, R.
2017; 208 (2): 351-356
- **Performance of a Machine Learning Classifier of Knee MRI Reports in Two Large Academic Radiology Practices: A Tool to Estimate Diagnostic Yield.** *AJR. American journal of roentgenology*
Hassanpour, S., Langlotz, C. P., Amrhein, T. J., Befera, N. T., Lungren, M. P.
2017: 1-4
- **Characterization of Change and Significance for Clinical Findings in Radiology Reports Through Natural Language Processing.** *Journal of digital imaging*
Hassanpour, S., Bay, G., Langlotz, C. P.
2017
- **Bone Tumor Diagnosis Using a Naïve Bayesian Model of Demographic and Radiographic Features.** *Journal of digital imaging*
Do, B. H., Langlotz, C., Beaulieu, C. F.
2017
- **"Chasing a Ghost": Factors that Influence Primary Care Physicians to Follow Up on Incidental Imaging Findings.** *Radiology*
Zafar, H. M., Bugos, E. K., Langlotz, C. P., Frasso, R.
2016; 281 (2): 567-573
- **Why Isn't There More High-fidelity Simulation Training in Diagnostic Radiology? Results of a Survey of Academic Radiologists** *ACADEMIC RADIOLOGY*
Cook, T. S., Hernandez, J., Scanlon, M., Langlotz, C., Li, C. L.
2016; 23 (7): 870-876
- **Health IT vendors and the academic community: The 2014 ACMI debate.** *Journal of biomedical informatics*
McCray, A. T., Glaser, J., Koppel, R., Langlotz, C. P., Silverstein, J.
2016; 60: 365-375
- **Unsupervised Topic Modeling in a Large Free Text Radiology Report Repository.** *Journal of digital imaging*
Hassanpour, S., Langlotz, C. P.
2016; 29 (1): 59-62
- **Predicting High Imaging Utilization Based on Initial Radiology Reports: A Feasibility Study of Machine Learning** *ACADEMIC RADIOLOGY*
Hassanpour, S., Langlotz, C. P.
2016; 23 (1): 84-89
- **Optimization of Radiology Reports for Intensive Care Unit Portable Chest Radiographs Perceptions and Preferences of Radiologists and ICU Practitioners** *JOURNAL OF THORACIC IMAGING*
Barbosa, E. J., Lynch, M. C., Langlotz, C. P., Gefter, W. B.
2016; 31 (1): 43-48
- **Conversion of Radiology Reporting Templates to the MRRT Standard** *JOURNAL OF DIGITAL IMAGING*
Kahn, C. E., Genereaux, B., Langlotz, C. P.
2015; 28 (5): 528-536
- **Code Abdomen: An Assessment Coding Scheme for Abdominal Imaging Findings Possibly Representing Cancer.** *Journal of the American College of Radiology*
Zafar, H. M., Chadalavada, S. C., Kahn, C. E., Cook, T. S., Sloan, C. E., Lalevic, D., Langlotz, C. P., Schnall, M. D.
2015; 12 (9): 947-950
- **True "meaningful use": technology meets both patient and provider needs.** *American journal of managed care*
Black, H., Gonzalez, R., Priolo, C., Schapira, M. M., Sonnad, S. S., Hanson, C. W., Langlotz, C. P., Howell, J. T., Apter, A. J.
2015; 21 (5): e329-37
- **True "Meaningful Use": Technology Meets Both Patient and Provider Needs** *AMERICAN JOURNAL OF MANAGED CARE*
Black, H., Gonzalez, R., Priolo, C., Schapira, M. M., Sonnad, S. S., Hanson, C. W., Langlotz, C. P., Howell, J. T., Apter, A. J.
2015; 21 (5): E329-E337

- **Assessment of Follow-up Completeness and Notification Preferences for Imaging Findings of Possible Cancer: What Happens After Radiologists Submit Their Reports?** *ACADEMIC RADIOLOGY*
Sloan, C. E., Chadalavada, S. C., Cook, T. S., Langlotz, C. P., Schnall, M. D., Zafar, H. M.
2014; 21 (12): 1579-1586
- **Ten Commandments for Effective Clinical Decision Support for Imaging: Enabling Evidence-Based Practice to Improve Quality and Reduce Waste** *AMERICAN JOURNAL OF ROENTGENOLOGY*
Khorasani, R., Hentel, K., Darer, J., Langlotz, C., Ip, I. K., Manaker, S., Cardella, J., Min, R., Seltzer, S.
2014; 203 (5): 945-951
- **Automated Extraction of Critical Test Values and Communications from Unstructured Radiology Reports: An Analysis of 9.3 Million Reports from 1990 to 2011** *RADIOLOGY*
Lakhani, P., Kim, W., Langlotz, C. P.
2012; 265 (3): 809-818
- **Clinical Decision Support for Imaging in the Era of the Patient Protection and Affordable Care Act** *JOURNAL OF THE AMERICAN COLLEGE OF RADIOLOGY*
Zafar, H. M., Mills, A. M., Khorasani, R., Langlotz, C. P.
2012; 9 (12): 907-918
- **Predictors of initial F-18-fluorodeoxyglucose-positron emission tomography indication among patients with colorectal cancer** *NUCLEAR MEDICINE COMMUNICATIONS*
Zafar, H. M., Kramer, S., Bonaccorsi, D., Langlotz, C. P., Armstrong, K.
2012; 33 (7): 739-746
- **The Diagnostic and Economic Yield of Neuroimaging in Neuro-ophthalmology** *JOURNAL OF NEURO-OPHTHALMOLOGY*
Mehta, S., Loevner, L. A., Mikityansky, I., Langlotz, C., Ying, G., Tamhankar, M. A., Shindler, K. S., Volpe, N. J.
2012; 32 (2): 139-144
- **Automated Detection of Critical Results in Radiology Reports** *JOURNAL OF DIGITAL IMAGING*
Lakhani, P., Kim, W., Langlotz, C. P.
2012; 25 (1): 30-36
- **Extracting templates from radiology reports using sequence alignment** *INTERNATIONAL JOURNAL OF DATA MINING AND BIOINFORMATICS*
Wu, S., Langlotz, C. P., Lakhani, P., Ungar, L. H.
2012; 6 (6): 633-650
- **Informatics in Radiology An Information Model of the DICOM Standard** *RADIOGRAPHICS*
Kahn, C. E., Langlotz, C. P., Channin, D. S., Rubin, D. L.
2011; 31 (1): 295-U356
- **Automated Detection of Radiology Reports that Document Non-routine Communication of Critical or Significant Results** *JOURNAL OF DIGITAL IMAGING*
Lakhani, P., Langlotz, C. P.
2010; 23 (6): 647-657
- **Documentation of nonroutine communications of critical or significant radiology results: a multiyear experience at a tertiary hospital.** *Journal of the American College of Radiology*
Lakhani, P., Langlotz, C. P.
2010; 7 (10): 782-790
- **Documentation of Nonroutine Communications of Critical or Significant Radiology Results: A Multiyear Experience at a Tertiary Hospital** *JOURNAL OF THE AMERICAN COLLEGE OF RADIOLOGY*
Lakhani, P., Langlotz, C. P.
2010; 7 (10): 782-790
- **Comparison of two methods to transmit clinical history information from referring providers to radiologists.** *Journal of the American College of Radiology*
Agarwal, R., Bleshman, M. H., Langlotz, C. P.
2009; 6 (11): 795-799
- **Structured Radiology Reporting: Are We There Yet?** *RADIOLOGY*

- Langlotz, C. P.
2009; 253 (1): 23-25
- **Radiologist Use of and Perceived Need for Patient Data Access** *JOURNAL OF DIGITAL IMAGING*
Boonn, W. W., Langlotz, C. P.
2009; 22 (4): 357-362
 - **The IR Radlex Project: An Interventional Radiology Lexicon-A Collaborative Project of the Radiological Society of North America and the Society of Interventional Radiology** *JOURNAL OF VASCULAR AND INTERVENTIONAL RADIOLOGY*
Kundu, S., Itkin, M., Gervais, D. A., Krishnamurthy, V. N., Wallace, M. J., Cardella, J. F., Rubin, D. L., Langlotz, C. P.
2009; 20 (4): 433-435
 - **Improving language models for radiology speech recognition** *JOURNAL OF BIOMEDICAL INFORMATICS*
Paulett, J. M., Langlotz, C. P.
2009; 42 (1): 53-58
 - **Extracting Templates from Radiology Reports using Sequence Alignment** *IEEE International Conference on Bioinformatics and Biomedicine (BIBM 2009)*
Wu, S., Langlotz, C. P., Lakhani, P., Ungar, L. H.
IEEE.2009: 314-318
 - **Structured Reporting: Patient Care Enhancement or Productivity Nightmare?** *RADIOLOGY*
Weiss, D. L., Langlotz, C. P.
2008; 249 (3): 739-747
 - **The radiology report of the future: a summary of the 2007 Intersociety Conference.** *Journal of the American College of Radiology*
Dunnick, N. R., Langlotz, C. P.
2008; 5 (5): 626-629
 - **From the chair: The top 10 myths about imaging informatics certification (January 2008-SIIM news)** *JOURNAL OF DIGITAL IMAGING*
Langlotz, C.
2008; 21 (1): 1-2
 - **RadLex: A new method for indexing online educational materials** *RADIOGRAPHICS*
Langlotz, C. P.
2006; 26 (6): 1595-1597
 - **Mentoring the mentors: Aligning mentor and mentee expectations** *ACADEMIC RADIOLOGY*
Lee, J. M., Anzai, Y., Langlotz, C. P.
2006; 13 (5): 556-561
 - **Development and validation of queries using structured query language (SQL) to determine the utilization of comparison imaging in radiology reports stored on PACS** *JOURNAL OF DIGITAL IMAGING*
Lakhani, P., Menschik, E. D., Goldszal, A. F., Murray, J. P., Weiner, M. G., Langlotz, C. P.
2006; 19 (1): 52-68
 - **A framework for improving radiology reporting.** *Journal of the American College of Radiology*
Sistrom, C. L., Langlotz, C. P.
2005; 2 (2): 159-167
 - **Using sonography to examine adult patients at an academic medical center: Have usage patterns changed with the expansion of managed care?** *AMERICAN JOURNAL OF ROENTGENOLOGY*
Liebeskind, M. E., Arger, P. H., Liebeskind, A., Maston, K., Langlotz, C.
2002; 179 (6): 1395-?
 - **The effect of PACS on the time required for technologists to produce radiographic images in the emergency department radiology suite** *JOURNAL OF DIGITAL IMAGING*
Redfern, R. O., Langlotz, C. P., Abbuhl, S. B., Polansky, M., Horii, S. C., Kundel, H. L.
2002; 15 (3): 153-160
 - **Automatic structuring of radiology reports: Harbinger of a second information revolution in radiology** *RADIOLOGY*
Langlotz, C. P.

2002; 224 (1): 5-7

- **The completeness of existing lexicons for representing radiology report information.** *Journal of digital imaging*
Langlotz, C. P., Caldwell, S. A.
2002; 15: 201-205
- **Evidence-based radiology: A new approach to the practice of radiology** *RADIOLOGY*
Black, W. C., Jadad, A. R., Jarvik, J. G., Kazerooni, E. A., Langlotz, C. P., Lentle, B. C., Maceneaney, P. M., Malone, D. E., Nahmias, C., Reed, M. H., Salena, B. J., Shannon, S. I., Stolberg, et al
2001; 220 (3): 566-575
- **Acute appendicitis: Comparison of helical CT diagnosis - Focused technique with oral contrast material versus nonfocused technique with oral and intravenous contrast material** *86th Scientific Assembly and Annual Meeting of the Radiological-Society-of-North-America (RSNA)*
Jacobs, J. E., Birnbaum, B. A., Macari, M., Megibow, A. J., Israel, G., Maki, D. D., Aguiar, A. M., Langlotz, C. P.
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- **Visualization of areae gastricae on double-contrast upper gastrointestinal radiography: Relationship to age of patients** *AMERICAN JOURNAL OF ROENTGENOLOGY*
Charagundla, S. R., Levine, M. S., Langlotz, C. P., Rubesin, S. E., Laufer, I.
2001; 177 (1): 61-63
- **Accuracy of MR imaging for staging prostate cancer: A meta-analysis to examine the effect of technologic change** *ACADEMIC RADIOLOGY*
Sonnad, S. S., Langlotz, C. P., Schwartz, J. S.
2001; 8 (2): 149-157
- **Economic consequences of diagnostic imaging for vocal cord paralysis** *ACADEMIC RADIOLOGY*
Liu, A. Y., Yousem, D. M., Chalian, A. A., Langlotz, C. P.
2001; 8 (2): 137-148
- **Prostate Cancer: What is the future role for imaging?** *Semiannual Meeting of the American-College-of-Radiology-Imaging-Network*
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AMER ROENTGEN RAY SOC.2001: 17-22
- **Readings in clinical imaging research: A structured bibliography** *ACADEMIC RADIOLOGY*
Langlotz, C. P.
2000; 7 (10): 880-890
- **Accuracy of CT angiography versus pulmonary angiography in the diagnosis of acute pulmonary embolism: Evaluation of the literature with summary ROC curve analysis** *ACADEMIC RADIOLOGY*
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- **Diagnosis of primary versus secondary achalasia: Reassessment of clinical and radiographic criteria** *AMERICAN JOURNAL OF ROENTGENOLOGY*
Woodfield, C. A., Levine, M. S., Rubesin, S. E., Langlotz, C. P., Laufer, I.
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- **The costs of CT procedures in an academic radiology department determined by an activity-based costing (ABC) method** *JOURNAL OF COMPUTER ASSISTED TOMOGRAPHY*
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- **Enhancing the expressiveness of structured reporting systems** *17th Symposium for Computer Applications in Radiology held at the Annual Meeting of the Society-for-Computer-Applications-in-Radiology (SCAR 2000)*
Langlotz, C. P.
SPRINGER.2000: 49-53
- **A picture archival and communication system shortens delays in obtaining radiographic information in a medical intensive care unit** *CRITICAL CARE MEDICINE*
Redfern, R. O., Kundel, H. L., Polansky, M., Langlotz, C. P., Horii, S. C., Lanken, P. N.
2000; 28 (4): 1006-1013

- **Enhancing the expressiveness and usability of structured image reporting systems** *Annual Symposium of the American-Medical-Informatics-Association*
Langlotz, C. P., Meininger, L.
HANLEY & BELFUS INC.2000: 467-471
- **Cost-effectiveness of MR imaging and core-needle biopsy in the preoperative work-up of suspicious breast lesions** *83rd Annual Meeting of the Radiological-Society-of-North-America*
Hrung, J. M., Langlotz, C. P., Orel, S. G., Fox, K. R., Schnall, M. D., Schwartz, J. S.
RADIOLOGICAL SOC NORTH AMERICA.1999: 39-49
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Hrung, J. M., Sonnad, S. S., Schwartz, J. S., Langlotz, C. P.
1999; 6 (7): 387-397
- **Gastrointestinal imaging: A systems analysis comparing digital and conventional techniques** *AMERICAN JOURNAL OF ROENTGENOLOGY*
Chawla, S., Levine, M. S., Laufer, I., Gingold, E. L., Kelly, T. J., Langlotz, C. P.
1999; 172 (5): 1279-1284
- **Assessment of a bolus-tracing technique in helical renal CT to optimize nephrographic phase imaging** *RADIOLOGY*
Birnbaum, B. A., Jacobs, J. E., Langlotz, C. P., Ramchandani, P.
1999; 211 (1): 87-94
- **Overcoming barriers to outcomes research on imaging: lessons from an abstract decision model.** *Academic radiology*
Langlotz, C. P.
1999; 6: S29-34
- **A critical synopsis of the diagnostic and screening radiology outcomes literature.** *Academic radiology*
Blackmore, C. C., Black, W. C., Jarvik, J. G., Langlotz, C. P.
1999; 6: S8-18
- **Correlation of lesion appearance and histologic findings for the nodes of a breast MR imaging interpretation model** *83rd Annual Meeting of the Radiological-Society-of-North-America*
Nunes, L. W., Schnall, M. D., Orel, S. G., Hochman, M. G., Langlotz, C. P., Reynolds, C. A., Torosian, M. H.
RADIOLOGICAL SOC NORTH AMERICA.1999: 79-92
- **Use of endorectal MR imaging to predict prostate carcinoma recurrence after radical prostatectomy** *83rd Scientific Assembly and Annual Meeting of the Radiological-Society-of-North-America*
Manzone, T. A., Malkowicz, S. B., Tomaszewski, J. E., Schnall, M. D., Langlotz, C. P.
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