

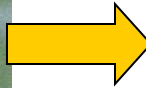


Frontiers in Cancer Screening Modalities

Management of Incidental Findings from Abdominal Imaging

Lincoln L. Berland, M.D., F.A.C.R.

- Consultant, Nuance, Inc.



What is Imaging?

- Will use “imaging” here to mean cross-sectional imaging (e.g. CT, MRI), not regular x-ray studies.
- Imaging is an astonishing extension of the physical examination.
- Must use judiciously because of cost and risk.

Role of Imaging in Screening

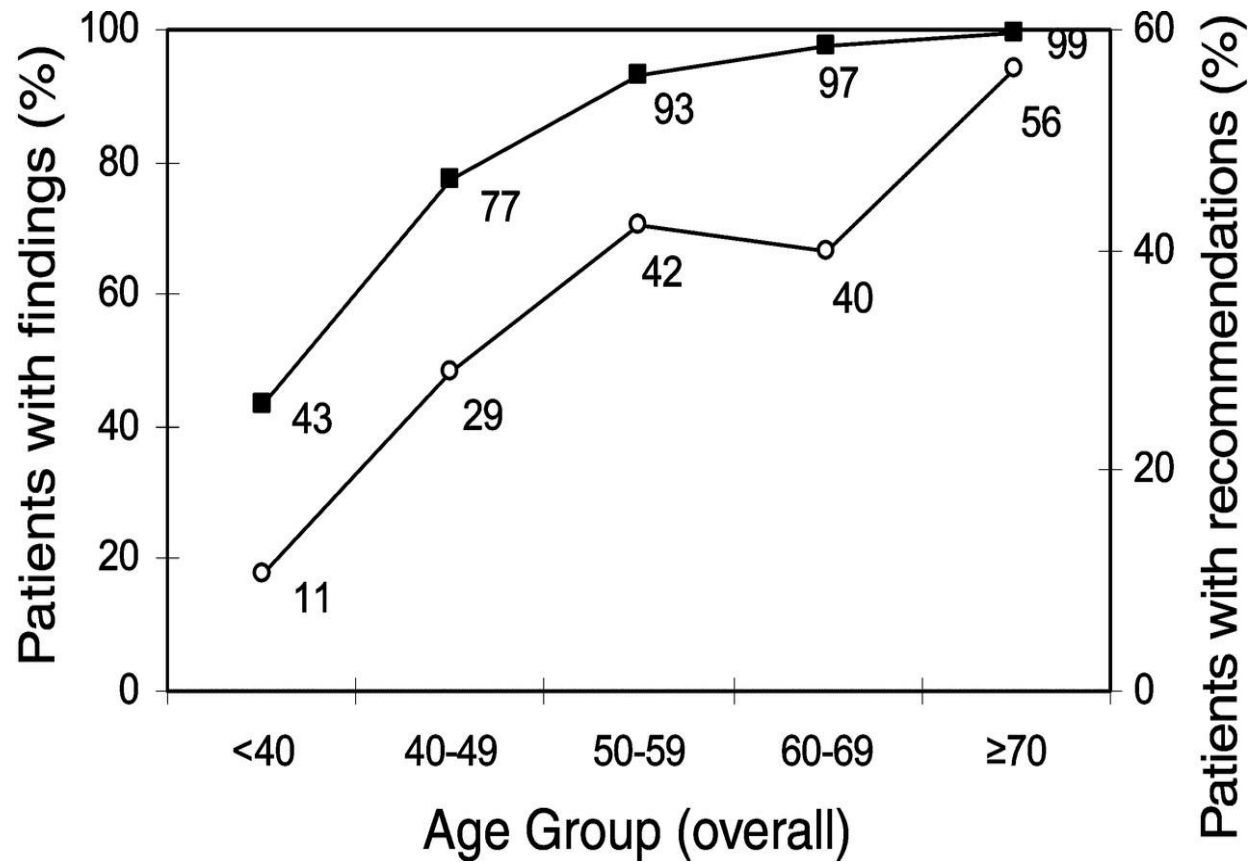
- Screening tries to find common, serious conditions when can still effectively intervene.
- Unlike other screening tests (like colonoscopy where you can just see the colon or PSA that is specific to the prostate), CT sees *everything*.
- So, *every* CT is a screening examination.
- We almost *all* have confusing internal “blemishes.”

Why Isn't This Problem Already Solved?

- Human nature to care more about what you are looking for than unintended consequences.
- Compared to the complexity of deadly diseases, incidental findings are just usually deadly boring.
- So, we are at a stage where we are making (well?) educated guesses about what to do.

Increased Frequency, Cost of Incidental Findings

Frequency of Findings, Recommendations



Furtado, C. D. et al. Whole-Body CT Screening: Spectrum of Findings and Recommendations in 1192 Patients. *Radiology* 2005;237:385-394

Radiology

Extracolonic Findings on CTC

Article	Patients	Patients with Missed Findings	Patients Getting Surgery, Bx	Patients Malignant, Serious Dx	Cost of Workup/ Population
Xiong, 2005	3280	2.7%	0.8%	3.7%	--
Yee, 2005	500	1.6%	1%	2.6%	\$28.12
Xiong, 2006	225	--	0.4%	--	\$297
Kim, 2007	3120	--	--	0.3%	--
Tolan et al, AJR 2007	400	--	--	12.3%	\$66.59

Incidental Findings on CTC

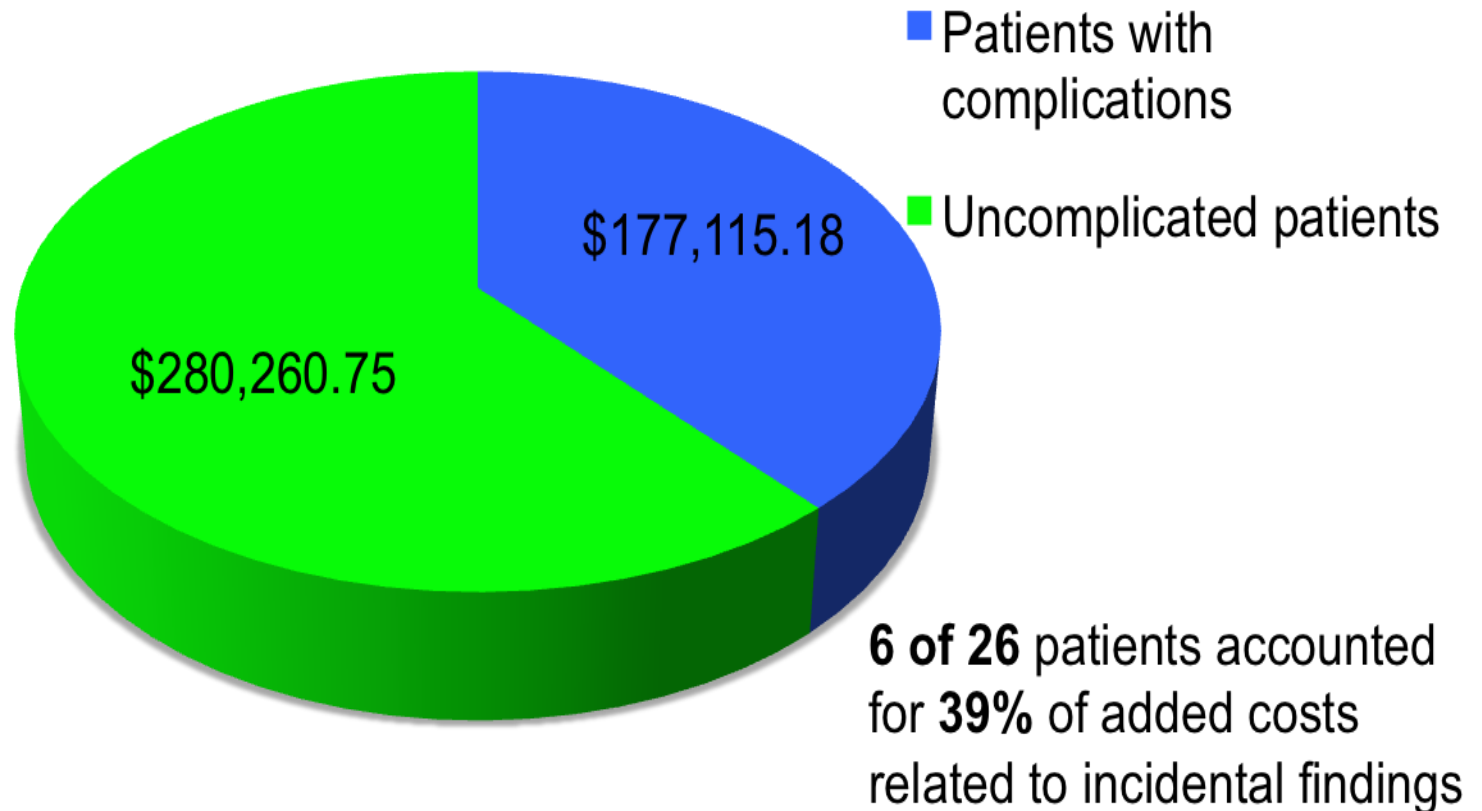
- 100,000 patients - Monte Carlo simulation
- Cost: \$162/patient
- 2292 life years gained, mostly from AAA
 - ◆ Only 13% of life years saved from cancer
 - ◆ \$7,063/life-year saved

Hassan C, Pickhardt PJ, Laghi A, et al. Computed tomographic colonography to screen for colorectal cancer, extracolonic cancer, and aortic aneurysm: model simulation with cost-effectiveness analysis. Arch Intern Med 2008; 168(7):696-705.

Incidental Findings at CT for Hematuria

- 1295 patients at UAB: CT for hematuria
- 9% of patients had important incidental findings, but no intervention
- 2% of patients underwent major intervention

Costs : Major Interventions



Costs of just 6 major interventions averaged over all 1295 patients: **\$353/patient**

Inconsistency of Detecting Incidental Findings and Making Recommendations

Incidental Adnexal Masses Detected at Low-Dose Unenhanced CT in Asymptomatic Women Age 50 and Older:

Implications for Clinical Management and Ovarian Cancer Screening¹

Perry J. Pickhardt, MD
Meghan E. Hanson, MD

Purpose:

To determine the prevalence, work-up, and outcomes of indeterminate adnexal masses identified at low-dose unenhanced computed tomography (CT) in asymptomatic women age 50 and older undergoing colonography screening.

**Materials and
Methods:**

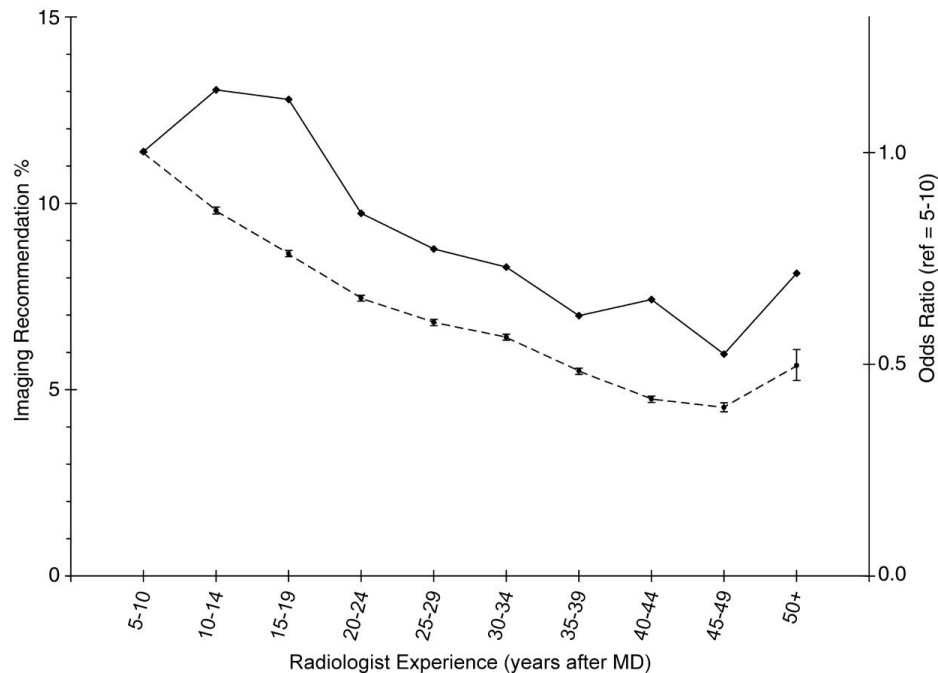
This study was institutional review board approved and HIPAA compliant. Informed consent was waived. The fate of indeterminate adnexal lesions identified at unenhanced CT in 2869 consecutive women (mean age, 57.2 years; age range, 50–97 years) undergoing colonography screening between April 2004 and December 2008 was evaluated.

Conclusion:

Incidental indeterminate adnexal lesions were relatively common at unenhanced CT (4.1%), but subsequent work-up revealed no ovarian cancers. Furthermore, a normal finding at CT was not protective against short-term development of ovarian cancer. More sophisticated risk factor assessment is needed to identify women at higher risk.

Increased Recommendations

- 5.9 M studies from 1995-2008
 - ◆ Odds of recommendations decreased by 15% per decade of radiologist experience



Sistrom C L et al. Recommendations for Additional Imaging in Radiology Reports: Multifactorial Analysis of 5.9 Million Examinations. Radiology 2009;253:453-461

Survey About Abdominal Recommendations

- 27 academic radiologists, 3 institutions
- 12 hypothetical incidental findings (thyroid, lung, bowel, spleen, etc.)
- Poor correlation between and even *within* institutions
- With only half, was there agreement in > 70%

Johnson PT, et al. Common Incidental Findings on MDCT: Survey of Radiologist Recommendations for Patient Management. JACR 2011;8:762-767.

- Guideline thresholds for recommending screening tests: fetal aneuploidy (0.33%), lung nodule, possible cancer (0.2%), breast cancer (0.1%), others up to 1%.
- Strong trend away from autocratic physician decision-making to patient autonomy and engagement, even though withholding some information improves patient's focus on important issues.
- Personal preferences and values of patients and physicians and legal concerns more powerful than evidence and precedent.
- No medical evidence-based, societal consensus or legal precedent for establishing risk-related thresholds for reporting, ignoring or recommending additional imaging for incidental findings.

Organized Radiology Approaches the Problem



Managing Incidental Findings on Abdominal CT: White Paper of the ACR Incidental Findings Committee

Lincoln L. Berland, MD^a, Stuart G. Silverman, MD^b, Richard M. Gore, MD^c, William W. Mayo-Smith, MD^d, Alec J. Megibow, MD, MPH^e, Judy Yee, MD^f, James A. Brink, MD^g, Mark E. Baker, MD^h, Michael P. Federle, MDⁱ, W. Dennis Foley, MD^j, Isaac R. Francis, MD^k, Brian R. Herts, MD^h, Gary M. Israel, MD^g, Glenn Krinsky, MD^l, Joel F. Platt, MD^k, William P. Shuman, MD^m, Andrew J. Taylor, MDⁿ

Top 25 Hottest Articles

Medicine and Dentistry > Journal of the American College of Radiology
April to June 2012

 RSS  Blog This!  Print [Show condensed](#)



- 1. Managing Incidental Findings on Abdominal CT: White Paper of the ACR Incidental Findings Committee** • Review article 
Journal of the American College of Radiology, Volume 7, Issue 10, October 2010, Pages 754-773
Berland, L.L.; Silverman, S.G.; Gore, R.M.; Mayo-Smith, W.W.; Megibow, A.J.; Yee, J.; Brink, J.A.; Baker, M.E.; Federle, M.P.; Foley, W.D.; Francis, I.R.; Herts, B.R.; Israel, G.M.; Krinsky, G.; Platt, J.F.; Shuman, W.P.; Taylor, A.J.
 Cited by SciVerse Scopus (46)
- 2. ACR Appropriateness Criteria[®](R) Right Lower Quadrant Pain-Suspected Appendicitis** • Review article 
Journal of the American College of Radiology, Volume 8, Issue 11, November 2011, Pages 749-755
Rosen, M.P.; Ding, A.; Blake, M.A.; Baker, M.E.; Cash, B.D.; Fidler, J.L.; Grant, T.H.; Greene, F.L.; Jones, B.; Katz, D.S.; Lalani, T.; Miller, F.H.; Small, W.C.; Spottswood, S.; Sudakoff, G.S.; Tulchinsky, M.; Warshauer, D.M.; Yee, J.; Coley, B.D.
 Cited by SciVerse Scopus (5)



Managing Incidental Findings on Abdominal and Pelvic CT and MRI, Part 1: White Paper of the ACR Incidental Findings Committee II on Adnexal Findings

Maitray D. Patel, MD^a, Susan M. Ascher, MD^b,
Raj Mohan Paspulati, MD^c, Alampady K. Shanbhogue, MD^d,
Evan S. Siegelman, MD^e, Marjorie W. Stein, MD^f,
Lincoln L. Berland, MD^g

SA-CME

Managing Incidental Findings on Abdominal and Pelvic CT and MRI, Part 2: White Paper of the ACR Incidental Findings Committee II on Vascular Findings

Faisal Khosa, MD^a, Glenn Krinsky, MD^b, Michael Macari, MD^c,
E. Kent Yucel, MD^d, Lincoln L. Berland, MD^e

SA-CME

✓ EDITOR'S CHOICE

Managing Incidental Findings on Abdominal and Pelvic CT and MRI, Part 3: White Paper of the ACR Incidental Findings Committee II on Splenic and Nodal Findings

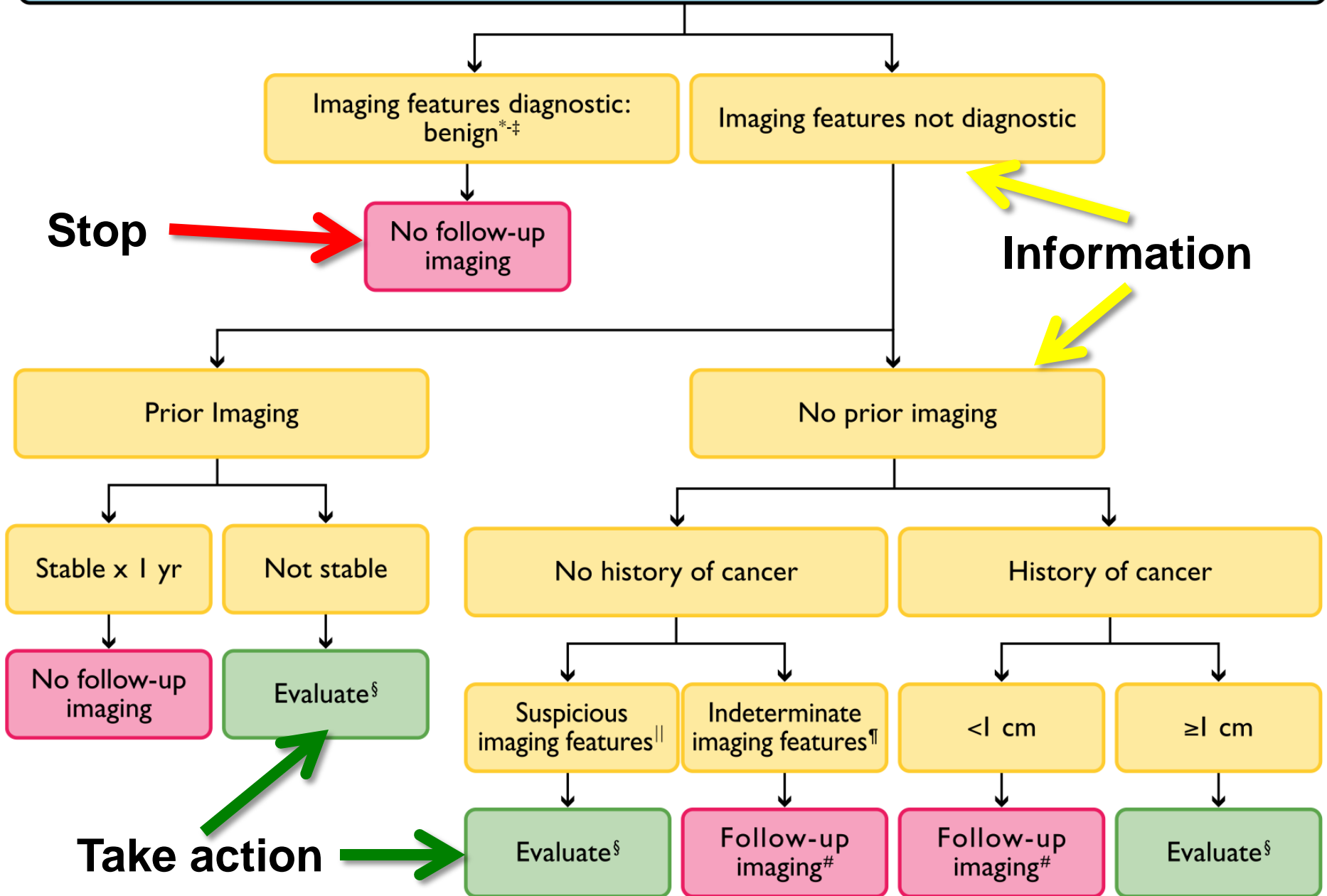
Matthew T. Heller, MD^a, Mukesh Harisinghani, MD^b, Jeffrey D. Neitlich, MD^c, Paula Yeghiayan, MD^d,
Lincoln L. Berland, MD^e

SA-CME

Managing Incidental Findings on Abdominal and Pelvic CT and MRI, Part 4: White Paper of the ACR Incidental Findings Committee II on Gallbladder and Biliary Findings

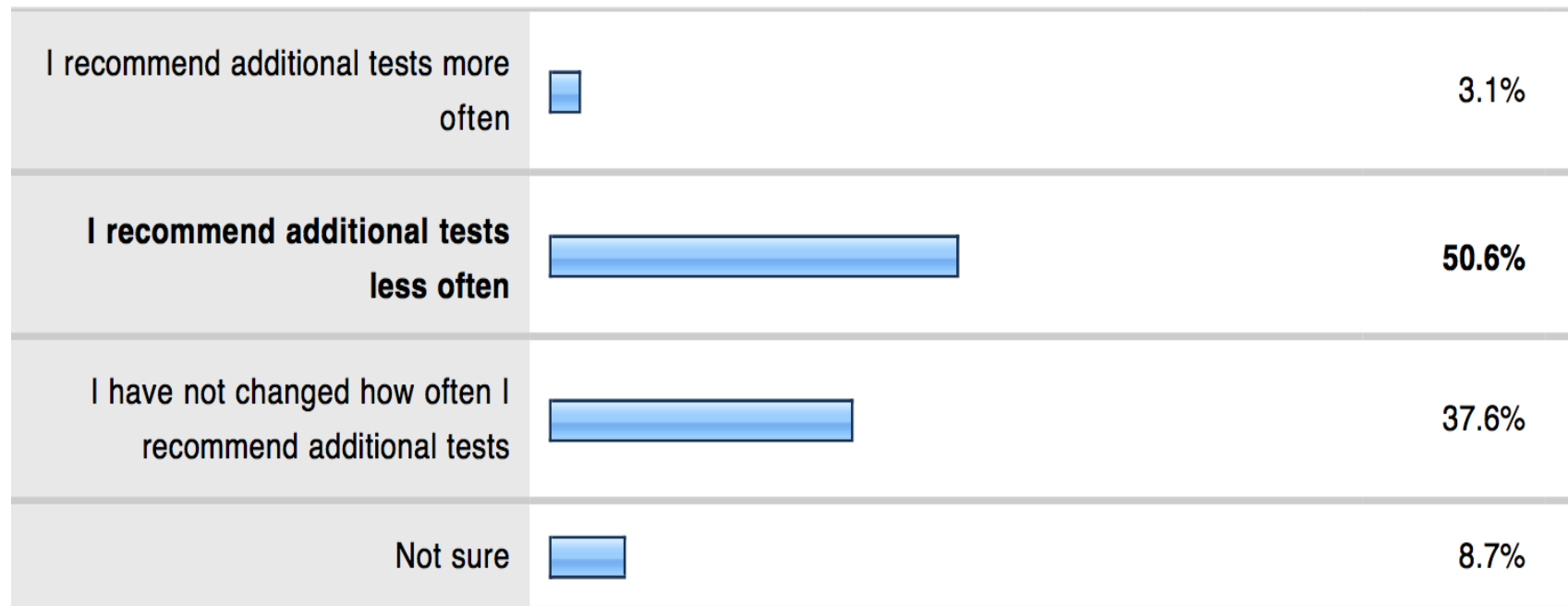
Sunit Sebastian, MD^a, Cyrillo Araujo, MD^a, Jeffrey D. Neitlich, MD^b,
Lincoln L. Berland, MD^c

Incidental Splenic Findings on CT or MRI








Survey of ACR about White Paper

Changing Recommendations (Read Paper)




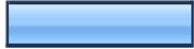


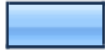
Reporting (Didn't Read Paper)

When you encounter a 1 cm low attenuating lesion...
with no history of malignancy and no prior studies,
...how you would report it?

I would not report such a finding		0.8%
"Lesion too small to characterize"		22.3%
"1 cm lesion, likely benign"		34.8%
"Recommend characterization [with another imaging modality]"		30.4%
"Recommend follow-up in 6-12 months"		11.7%

Reporting (Read Paper)

When you encounter a 1 cm low attenuating lesion...
with no history of malignancy and no prior studies,
...how you would report it?

I would not report such a finding		0.8%
"Lesion too small to characterize"		20.7%
"1 cm lesion, likely benign"		58.5%
"Recommend characterization [with another imaging modality]"		9.5%
"Recommend follow-up in 6-12 months"		10.4%

Applying in Daily Practice – Best Practices

- So, currently IF management is at best unpredictable and at worst chaotic.
- Comprehensive answer is partly decision support application and assisted structured reporting. (ref: Boland, et al. **Decision Support for Radiologist Report Recommendations. JACR 2011;8:819-823**)
- Printed copies of algorithms and papers and place in folder at workstations.
- Online access.

Dilemma of Imaging and Screening

- Imaging is a very powerful screening tool, so we can't abandon it because of IFs – actually, want to do more.
- Seeing confusing IFs is unavoidable.
- Medicolegal risk is very limited. Insidious *culture* of 100% certainty is underappreciated as cause of overuse of healthcare services.
- Challenge is to achieve a rational and balanced way to improve recommendations and to assure that most do it consistently.

- A big ethical problem is that with IFs, we may help some people who need help,
- But, we may also hurt some people – usually different, healthy people who don't need our meddling.
- Don't assume that either the patient or radiologist is “better safe than sorry” when pursuing incidental findings because we will often find that we are more sorry than safe.