Structured Reporting for Diuresis Renography
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“Price is what you pay. Value is what you get.”

Warren Buffett
Inaugural address to the 2004 American Roentgen Ray Society Meeting

Radiology reporting

Need for new technologies to achieve standardization and structure for radiology reports

Incoming president: Christopher Merritt, MD
A Framework for Improving Radiology Reporting

The interpretative reports rendered by radiologists are the only tangible manifestations of their expertise. The documents are very often the primary means by which radiologists provide patient care.

Sistrom CL, Langlotz CP. J Am Coll Radiol 2005; 2:159-167
RSNA Radiology Reporting Initiative

Goal: Improve reporting practices by creating a library of clear and consistent report templates.

Methodology: 12 subcommittees of subspecialty experts are creating a library of best-practices radiology report templates.
The templates integrate all of the evidence collected during the imaging procedure

1. Clinical data
2. Coded terminology
3. Technical parameters
4. Measurements
5. Annotations
6. Key images
RSNA Radiology Reporting Initiative

Rationale:

1. Create uniformity and improve your communication with referring providers
2. Enable your practice to meet accreditation criteria
3. Help your practice earn pay-for-performance incentives.

Kahn et al. Radiology 2009;252:852
ASNC
American Society of Nuclear Cardiology
Standardized reporting of radionuclide myocardial perfusion and function

“ASNC supports the mandatory use of structured reporting using standardized data elements in myocardial perfusion imaging reports. This should be implemented as part of the laboratory accreditation process.”

Technique: 11.3 mCi 99m MAG3 utilized as well as 40 mg of lasix (furosemide)

Impression:
1. Severely impaired expiratory (excretory) dysfunction of kidneys bilaterally with marked response to Lasix suggesting some degree of obstructive component.
2. Mildly impaired uptake function of the left kidney
ISCORN REPORTS

1. Renovascular Hypertension
2. Clearance measurements
3. Diuresis renography
4. QC of quantitative renogram measurements
5. Renal cortical scintigraphy in children
6. Technical aspects of transplant scintigraphy
7. Transit times
ISCORN Member Renography Reports

**Content:** Marked variation in report content within and between institutions

**Impression:** Marked variation in the manner in which the impression is communicated to the referring physician
Reason for referral*

1. **Obstruction (35%)**
2. Normal kidneys, donor evaluation (29%)
3. Renovascular hypertension (12%)
4. Transplant evaluation (11%)
5. Renal function (relative/absolute) 10%
6. Other (3%)
7. Evaluation of pediatric patients (0%)

*1993 renal scans between 1994 and 2002
1. **Obstruction (49%)**
2. Renovascular hypertension (17%)
3. Transplant evaluation (15%)
4. Renal function (relative/absolute) 14%
5. Other (4%)
7. Evaluation of pediatric patients (0%)

*1415 renal scans between 1994 and 2002*
Diuresis Renography

- M. Donald Blaufox, MD, PhD
- Diego De Palma, MD
- Eva V. Dubovsky, MD, PhD
- Belkis Erbas, MD
- Anni Eskild-Jensen, MD, PhD
- Jørgen Frøkiaer, MD
- Muta M. Issa, MD, MPH
- Amy Piepsz, MD
- Alain Prigent, MD, PhD
Who/what is the report for?

• The patient
• The referring physician
• Quality assurance
• Reimbursement (accountability)
• Research
Why have structured reports?

• Optimize patient care
• Communicate the scan findings and implications in a clear and concise manner
• Contain essential elements required to evaluate and interpret the study
• Document technical aspects of the procedure for purposes of accountability/reimbursement
• Provide ongoing quality assurance measures
• Facilitate clinical research
What is a structured report?

- Standard language
- Structured format
- Consistent content
“Reporting into structure”

During report creation, a predefined format may fundamentally alter the way an interpreting physician thinks about the case as he/she produces the document.

Sistrom et al. AJR 2005;184:804
A predefined format structure specifies the elements that need to be acquired to assure the quality of the study as well as to assure a report that maximizes the diagnostic utility of the procedure.
“Reporting into structure”

Reporting into structure guides the assembly of the essential elements required to reach an informed conclusion.
How should the report be structured?

• Indication
• Clinical history
• Procedure
• Findings
• Impression
Structured reports for diuresis renography

• Restricted to adults
• Broadly applicable
• Guidance document (not prescriptive)
• Not to replace the consensus reports on diuresis renography

What elements should a report contain?
Modified Delphi Approach

• List of scan elements
  – Procedure: 20
  – Findings: 25
  – Impression: 26

• Each panel member scored each element

• Essential (mandatory), recommended, optional, not required

• Comments/justifications/suggestions
Specify that only tubular agents should be used for diuresis renography

Should there be a statement on radiation exposure and/or radiation risk?

SUSPECTED OBSTRUCTION

CLINICAL INFORMATION

If there is no recent serum creatinine, state this in report (implies physician looked)
If there are no recent imaging tests evaluating obstruction, state this in report
If there are no recent urological procedures, state this in report
If the patient is not taking diuretics, state that in the report

PROCEDURE

State method of calculating T 1/2 (count based, linear fit, exponential fit)
If there was no additional hydration, state that no additional hydration was provided.
Patients should receive 500 mL of water 30 min prior to the test or other hydration
State method of calculating relative uptake (AUC, Patlak, slope).
For calculating the T1/2, assign the ROI over the whole kidney
For calculating the T1/2, assign the ROI over retained activity in the collecting systems.

FINDINGS

Presence (or absence) of left or right flank pain following furosemide administration
Time to half peak for the whole kidney ROI (T 1/2 after furosemide administration)
T 1/2 for ROI limited to tracer retained in the renal collecting system
In addition to % uptake, Tmax and T/1/2, state values for all renogram parameters measured
In addition to % uptake, Tmax and T/1/2, only state values for relevant renogram parameters

IMPRESSION (WHAT COMPONENTS SHOULD BE INCLUDED?)

If impression is "indeterminate for obstruction", give reasons study is indeterminate
If impression is "obstruction", summarize reasons for that interpretation
If impression is "no obstruction", summarize reasons for interpretation
Should the voided volume be listed in the Impression
Modified Delphi Approach

Results tallied

– Essential: 3
– Recommended: 4
– Optional: 2
– Not necessary: 0
Modified Delphi Approach

- Summary of scores and comments
- Blinded to individual scores/comments
- List of scan elements
  - Procedure: 22
  - Findings: 38
  - Impression: 33
- Essential, recommended, optional, not required
- Comments
Modified Delphi Approach

• Results tallied
• Third round of scoring
• Draft document submitted with 3rd round
Modified Delphi Approach

• Results tallied
• Fourth round of scoring
• 2nd draft document submitted with 4th round
• Agreed on a general structure
• Agreed on most of the elements
• 2nd Draft document under review by panelists
• Draft contains a structured normal report
• Additional elements submitted for clarification/voting
• Complete/submit manuscript to JNM for publication