



Radiology Utilization Action Team:

A Multidisciplinary Approach to Utilization Management and the
Development of Appropriate Imaging Practices

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Disclosures

The authors nor any of their immediate family members have a financial relationship with a commercial organization that may have a direct or indirect interest in the content of this presentation.

Objectives

- To introduce a **novel method** of radiology utilization management (RUM)
- To describe specific features of this approach:
 - Comparison to other RUM methods
 - Goals/Mission
 - Organizational structure
 - Processes
 - Initiatives
 - Data collection, analysis, and presentation
 - Creation of resources for ongoing support of goals
- To present example outcomes of application of this system

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Radiology Utilization Management

Reality of Modern Practice: Attempt to Control Costs

- Emerged over the last 15 years in response to medical imaging playing a large role in rising healthcare costs
- Has developed in two major forms
 - Radiology benefits management (RBM)
 - Computerized decision support (CDS) at the point of order entry
- Radiologist has a passive, if any, role in predominant forms of RUM

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Radiology Utilization Management

Radiology Benefits Management

- Typically performed by a third party that reviews imaging requests for a payer i.e. “Pre-authorization”
- Providers, both referring physicians and radiologists, are essentially “out of the loop” and decisions are made by payer/RBM entity
- Perceived as restrictive, with increased administrative hassle

Computer Decision Support

- Automated tools integrated into EMR provide guidance on appropriateness of order being placed
- Voluntary, i.e. ordering physician can ignore software suggestions or manipulate parameters to “fool” system
- No direct involvement for radiologist

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The RUAT approach to RUM



“Radiology Utilization Action Team”

- **Multidisciplinary** team of physicians and allied healthcare workers tasked with:
 - Gathering and analyzing data pertaining to imaging exams
 - Presenting this data to referring physicians and other stakeholders with the idea of ensuring appropriate ordering trends
- Radiologists can play a central role in this approach
 - **Dynamic**
 - Non-restrictive

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The RUAT approach to RUM

What is the point?

- Ultimate aim is *better patient care*
 - Evidence-based care resulting in improved *patient safety and clinical efficiency*
 - Minimize *unnecessary radiation exposure* to patient populations
- Utilization management becomes a secondary benefit
 - Reduce *inefficient resource utilization*
 - Decrease *unjustified variation* in ordering practice

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The RUAT approach to RUM

Goals pertaining to RUM

- Optimize use of radiology resources based on the *best available scientific evidence*
- Low utilization of an imaging modality *is not* necessarily indicative of best practice and is not a desired result
- Ordering/referring physicians expected to use their best judgment about what is best for their patients
 - RUAT to provide regular updates as to what constitutes *appropriate variation* in ordering
 - Ultimately the practices advocated by the team should become *second nature*

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RUAT Organization



Who is involved?

- At our institution, the team is led by a radiologist and urgentologist, who serve as co-chairs
- Administrative support provided by a project manager
- Current team members include family medicine, internal medicine, vascular surgery, and emergency physicians as well as the chief of the radiology department and an NP
- Team structure is variable, w/ team members serving voluntarily
 - Periodically, the team will reach out to an MD in a specific specialty to act as a "Champion" for a specific initiative or goal

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RUAT Process

Logistics

- Team meets monthly or bi-monthly
- Review initiatives and associated data
 - Current initiatives – use data as a conversation starter to encourage best practices
 - Past initiatives – reinforcement/reminder
 - Future initiatives – plan for other areas of focus
- Develop strategy for delivery of data/metrics to referring clinicians
 - Members of the team either meet directly with the chief of a department or can attend a department-wide meeting
 - Smaller group discussions – ie. w/ the top "outliers**" identified by data

*Outliers: physicians whose ordering practices differ significantly from those of their peers

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RUAT Initiatives



Areas of Focus for Action

- Typically deal with high cost or complex examinations such as breast MRI, but could be applicable to plain film or ultrasound
- Many initiatives exist simultaneously at our institution, dealing with examinations ranging from radiographs of the lumbar spine to PET/CT to shoulder MRI

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RUAT Initiatives

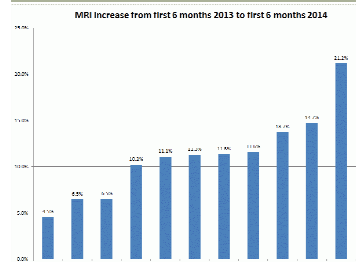
Implementation Process



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RUAT Initiatives

The Implementation Chain: Clinical Example



Graph represents actual data from multiple clinical sites. Specific initiative to deal with this situation has not yet been developed.

- MRI volume increasing
- RUAT can look at where increase is occurring – in this case hypothetically say driven by ER
- Communicate guidelines to ER physicians and present individual ordering data
- Develop targets and track data generated going forward
- Resubmit data to refresh/remind the ordering physicians – every 6-8 weeks to further effect change during initiative

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RUAT Data

Source, Organization, Analysis

- Data regarding the chosen initiatives is culled from the [electronic medical record](#)
- Acquired for all [individual physicians](#) who order the particular examination
- Organized by multiple factors depending on initiative
 - Type of practitioner, date/time, diagnosis, patient class, etc.
- Analyzed for trends – diagnoses where imaging is of little value, appropriate use of services depending on patient setting, outliers, etc.

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RUAT Data

How do we use the data?

- To provide a concrete way to visualize personal ordering practices and those of colleagues
- RUAT can focus on top 20% of over users (“outliers”)
 - Non-punitive, educational:
 - Why are you ordering differently than your peers?
 - How can you modify behavior?
 - [*What can we do to help?*](#)
 - You are not alone!

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RUAT Outcomes

“Limited” Ultrasounds

- A noticeable increase in volume of abdominal US prompted the radiologists on RUAT to comment on the availability of a “limited” US exam for certain clinical situations
- An initiative to educate and inform ordering physicians of the availability of this type of study was developed
- A communication was drafted by the team and sent to all physicians via email

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RUAT Outcomes

“Limited” Ultrasounds: Email Communication

The Radiology Utilization Action Team (RUAT), made up of a multi-specialty group of physicians and practitioners, provides guidance regarding the most efficient use of imaging resources to the medical staff. **In keeping with this mission, RUAT would like to remind the medical staff of the availability of an order for limited abdominal ultrasounds:**

Limited Abdominal US Order

For specific clinical situations, a limited abdominal US study is available. The order can be found in EMR by entering **USABDLMT** or **code 76705AN**. When ordering limited studies, be sure to specify the area of interest in the **comments** section, for example "right upper quadrant" or "right lower quadrant."

Some situations in which limited abdominal US studies are appropriate include the following, listed by quadrant:

RUQ- suspected cholelithiasis or cholecystitis; elevated hepatic enzymes; RUQ pain
RLQ- suspected appendicitis/RLQ pain
LUQ- suspected splenomegaly

If you have any questions please contact one of the RUAT Co-leads, either Diego.A.Covarrubias@kp.org or Iqbal.Kasam@kp.org.

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RUAT Outcomes

“Limited” Ultrasounds: Results of Initiative

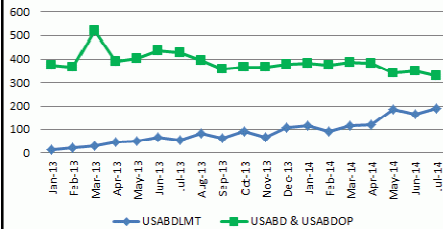
- US volume continued its increasing trend
- But limited examinations were performed more frequently, absorbing some of the growth in ordering
 - Improving technologist workflow/throughput – **efficiency**
 - Improving access/availability of exams – **patient satisfaction**
- Subsequent communication was sent out 6 months after initial email to **reinforce/remind** clinicians of availability of limited US order

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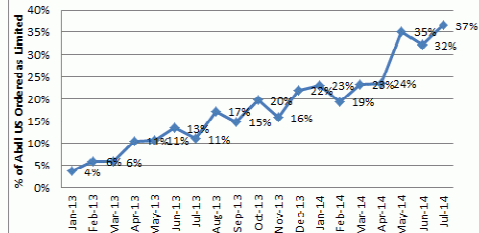
RUAT Outcomes

“Limited” Ultrasounds: Results of Initiative

WLA RUAT - Limited vs Full Abdominal US Orders 2013-2014



% Abdominal US Ordered as Limited Studies 2013-2014



RUAT Outcomes

Cardiac Studies

- Several reasons for focus on cardiac studies:
 - High utilization of nuclear studies in both inpatient and outpatient settings – potential patient safety risk
 - Significant range in cost of exams
 - Limited supply of isotopes
- Developed ordering guidelines for variety of cardiac exams
- Education sessions held with hospitalists, Internal Medicine, Family Medicine and Emergency Department physicians
- Laminated cards and posters with ordering guidelines distributed

RUAT Outcomes

Cardiology Nuclear vs. Treadmill Studies: Ordering Guidelines

CARDIOLOGY TEST ORDERING GUIDELINES			
Test	Advantages/Indication	Disadvantages	Contraindicated
Treadmill – Order via eReferral	Easiest, little risk provides most information on symptoms, BP and HR response to exercise. Performed seven (7) days/week inpatient and five (5) days/week outpatient. Best screening test for most patients!	Contraindicated if LBBB or significant resting repolarization abnormality or inability to walk briskly. Patient must be able to achieve 85% or more of max predicted HR.	Uncompensated CHF Unstable Angina Uncontrolled BP Severe AS Advanced A-V block w/o pacemaker Severe Mitral valve disease Uncooperative patient
Myocardial Perfusion Scan-Treadmill 78452t – new code	Patient can exercise adequately and additional perfusion information is required. Not a screening test. Can determine degree of ischemic burden in patients with known CAD	Requires two parts to complete study Radiation exposure. Lid availability. Radiation exposure Mon-Fri	
Myocardial Perfusion Scan-Lexcan Previously Adenosine. Order 78452t and write Lexcan under comments	Patient unable to exercise to a HR of 85% of predicted for age (220-age). Noninvasive	Radiation exposure Mon-Sat	Patient wheezing, poorly controlled asthma Advanced A-V block Pregnant Lactating Uncooperative patient
Echo Stress Test – Order via eReferral	Requires MD, echo and ECG techs. Non-invasive. Requires pt to be able to exercise to 85% HR. No radiation	Limited availability Difficult in obese pt or in pt with poor echo windows Currently two times/weeks	Same as Treadmill
Coronary Angiogram – Ordered only by Cardiology	For pts with NSTEMI or uncontrolled chest pain post MI. Not a screening test.	Invasive with increased risks. Not done at WLA. Radiation and contrast exposure.	

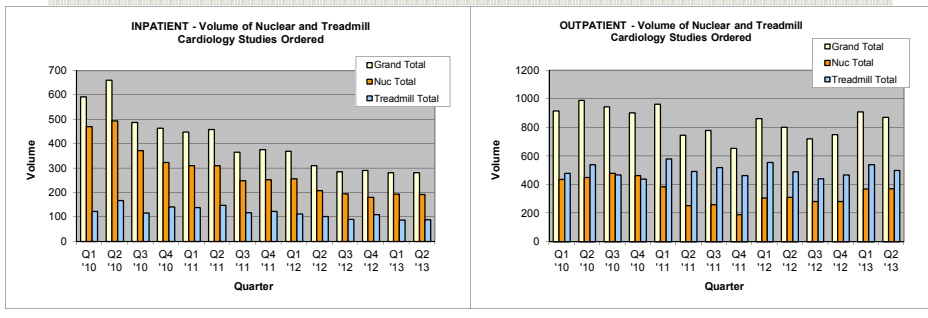
Contact Cardiology dept. pager #1017 for questions
Please give weight of patient (esp. if >250lbs.) to determine Isotope and ability to exercise

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RUAT Outcomes

Cardiology Nuclear vs. Treadmill Studies: Results of Initiative

- Data regularly shared after the communication blitz
- Inpatient volumes decreased overall
- Outpatient volumes continue to vary



RUAT Guidelines

Team creates guidelines for specific clinical situations or ordering of certain exams

- As an example: Thyroid Ultrasound
- Champions from ENT, endocrinology perform comprehensive literature review
- Team reviews existing guidelines from specialty societies such as the American Association of Clinical Endocrinologists
- Team proposes an official recommendation for local physicians to follow:

“Do not routinely order a thyroid ultrasound in patients with abnormal thyroid function tests if there is no palpable abnormality of the thyroid gland.”

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Example Local Guidelines Developed by RUAT for MRI Brain/Head CT Ordering

Clinical Scenario	Non-contrast CT Head	Non-contrast MRI Brain	Contrast MRI Brain	Either/Or
Acute persistent headache	X			
Rapidly progressive dementia		X		
Senile dementia non focal examination	X			
Acute stroke/TIA*	X			
Focal neurological symptoms/signs	X	X		X
Brainstem symptoms/signs		X		
Head trauma, GCS < 15	X			
Unilateral hearing loss		X	X	
Chronic headache non focal examination**	X			

*Further studies per recommendation from Neurology

**Imaging NOT required in the absence of Red Flags (see below)

Other Recommendations:

If you're evaluating for aneurysm rule out, consider ordering CT Angiogram.
Page Neurology with inquiries pertaining to other clinical syndromes.

Red Flags (for Acute New Onset Headache):

Think of worst-case scenarios

Meningitis/Encephalitis - headache, fever, meningeal signs, altered mental status, seizure. **To ED if these features are present.**

Subarachnoid Hemorrhage - sudden onset, severe head and/or neck pain, brief loss of consciousness at onset, pain is persistent for several hours to days, diplopia, ptosis, other focal neurological signs. **To ED if these features are present.**

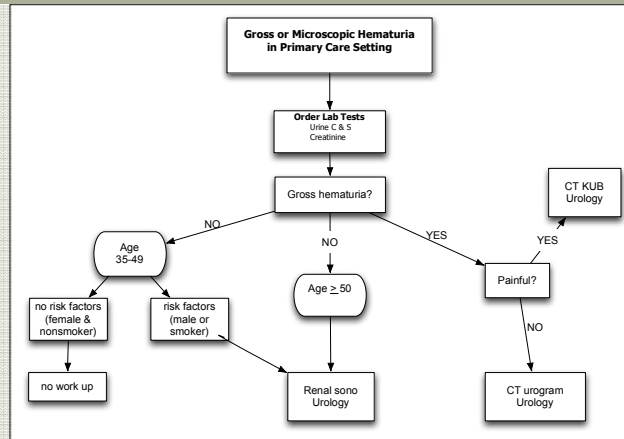
Space Occupying Lesions - cancer, abscess (very rare), subdural hematoma. **To ED if altered mental status, focal neurological symptoms or signs, seizure.**

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RUAT Guidelines

Example Regional Guidelines Developed by RUAT for Hematuria



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RUAT Resources

- Team member contact info is available to all physicians
 - RUAT discussed as part of all new hire orientations
- Physicians able to engage members of the action team **at any time** for direct consultation or advice
- RUAT website with guidelines, data, and other useful information



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RUAT Resources

- Example of MRI order codes for most common exams on RUAT website
 - Similar documents exist for each modality
- Other resources include:
 - Guidelines for ordering exams
 - Archival ordering data
 - Radiation dose calculator

MR Most Common Procedures

Upper Extremity	Head or Brain
73221L - RT Shoulder without contrast	70551C - Brain w/o contrast
73221G - LT Shoulder without contrast	70553D - Brain w/contrast (STD)
73221R - RT Elbow without contrast	70553F - IAC with/without contrast
73221M - LT Elbow without contrast	207009 - Orbits with/without contrast
73221K - RT Wrist without contrast	206997 - Sella/Pituitary with/without contrast
73221J - LT Wrist without contrast	206995 - Brain & MRA without contrast
73218G - RT Hand without contrast	210925 - Brain & MRA Brain & Neck without contrast
73218E - LT Hand without contrast	70548A - MIV Brain without
73218M - RT Upper Extremity without contrast	70336B - TMJ
73220M - RT Upper Extremity with/without contrast	
73218N - LT Upper Extremity without contrast	
73220H - LT Upper Extremity with/without contrast	
225584 - RT Shoulder Arthrogram	
225583 - LT Shoulder Arthrogram	

Chest/Breasts	Soft Tissue Neck
70540A - Brachial Plexus without contrast	70540C - Neck without contrast
71550B - Chest without	70543A - Neck with/without contrast
	70543F - Neck/Pharynx without contrast
	70547B - MRN/Neck without contrast

Abdomen	Pelvis
74183H - Liver with/without contrast	72195B - Pelvis without contrast
74183G - Pancreas with/without contrast	72197B - Pelvis with/without contrast
74183F - Kidney with/without contrast	72195F - Scrotum/Testes without contrast
74181E - Adrenals with/without contrast	73721W - Hips without contrast
74183C - Abdomen with/without contrast (for other than listed)	
74181B - MRCP	
74185G - MRA Renal Arteries	

Lower Extremity	Cervical Spine
73721O - RT Knee without contrast	72141B - C5 without contrast
73721P - LT Knee without contrast	72141C - C5 with contrast
73721M - RT Ankle without contrast	72146B - T Spine w/o contrast
73721N - LT Ankle without contrast	72157C - T Spine with/without contrast
73718K - RT Foot without contrast	
73720F - RT Foot with/without contrast	
73718E - LT Foot without contrast	
73720H - LT Foot with/without contrast	
73718S - RT Lower Extremity without contrast	
73720M - RT Lower Extremity with/without contrast	
73718T - LT Lower Extremity without contrast	
73720M - LT with/without contrast	

Thoracic Spine	Lumbar Spine	Multiple Spine
207155 - CS & TS without contrast	72148C - L5 w/o contrast	207155 - CS & TS without contrast
206994 - TS & LS without contrast	72158B - L Spine with/without contrast	206994 - TS & LS without contrast
210979 - TS & LS with/without contrast	72195E - Sacrum/Coccyx without contrast	210979 - TS & LS with/without contrast
206998 - CS, TS & LS without contrast		206998 - CS, TS & LS without contrast
207008 - CS, TS & LS with/without contrast		207008 - CS, TS & LS with/without contrast

All exams listed are MRI's, unless otherwise identified (ie: MA 's)

For questions please contact:
 Page ROD: 8-390-2500 x4607
 MR Department: 8-390-2757

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Conclusion

Utilization Management: entrenched and likely to be a fixture in the long term

- Radiologists have an opportunity to **actively participate** in UM
- RUAT approach **incorporates and values the expertise of the radiologist**, is a **dynamic, physician-controlled process** that allows for incorporation of best practice standards developed at the national level, such as ACR appropriateness criteria, as well the establishment of local or regional institutional guidelines based on **multidisciplinary collaboration**
- RUAT approach **complimentary** to and should enhance CDS systems



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Thank You!

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