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

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
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
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

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
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

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*
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

Implementation Process
**RUAT Initiatives**

**The Implementation Chain: Clinical Example**

- 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

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

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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.
RUAT Data

Head CT Sample
- Data regarding head CT ordering practices in the Urgent Care Department
- Provider names have been obscured for privacy
- This dataset specifically tracked:
  - Primary diagnosis
  - Other orders (lab work, etc.)
  - Whether or not the patient was admitted

RUAT Data

What do we look for?
- Depends on the design/goal of the initiative
- While any number of parameters are possible, best to:
  - Keep it simple!
  - Focus on reality of clinical situations
  - Above all ensure that the patient is receiving the best possible care, which may or may not include imaging
## 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!

## 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
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 USABDIAMT or code 767064AN. 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 cholecystitis or cholangitis; 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@kaiser.org or njbai.Kexam@kaiser.org.

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
RUAT Outcomes

“Limited” Ultrasounds: Results of Initiative

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
Cardiology Nuclear vs. Treadmill Studies: Ordering Guidelines

<table>
<thead>
<tr>
<th>Test</th>
<th>Indication</th>
<th>Disadvantages</th>
<th>Contraindicated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treadmill – Order as needed</td>
<td>Exert. Info incl. patient’s history</td>
<td>Contraindicated: Leukemia, Myeloma, Lymphoma; Bleeding disorders</td>
<td>Uncontrolled HTN</td>
</tr>
<tr>
<td>Coronary Angiogram – Only by Cardiology</td>
<td>Unable to assess heart function</td>
<td>False positive if current</td>
<td>Uncontrolled HTN</td>
</tr>
<tr>
<td>Cardiac Ultrasound – Very early</td>
<td>Cardiac evaluation</td>
<td>False negative if current</td>
<td>Uncontrolled HTN</td>
</tr>
<tr>
<td>MRI – Cardiac imaging</td>
<td>Cardiac function</td>
<td>False negative if current</td>
<td>Uncontrolled HTN</td>
</tr>
<tr>
<td>CT Angiography – Very late</td>
<td>Coronary anatomy</td>
<td>False negative if current</td>
<td>Uncontrolled HTN</td>
</tr>
<tr>
<td>Chest X-ray – Any patient</td>
<td>Chest evaluation</td>
<td>False negative if current</td>
<td>Uncontrolled HTN</td>
</tr>
<tr>
<td>ECHO Test – Order as needed</td>
<td>Echocardiogram</td>
<td>False negative if current</td>
<td>Uncontrolled HTN</td>
</tr>
<tr>
<td>Stress Test – Order as needed</td>
<td>Stress test</td>
<td>False negative if current</td>
<td>Uncontrolled HTN</td>
</tr>
<tr>
<td>Nuclear Angiography – Q3</td>
<td>Angiography</td>
<td>False negative if current</td>
<td>Uncontrolled HTN</td>
</tr>
</tbody>
</table>

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

![Pictorial representation of data](chart.png)
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.”

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

<table>
<thead>
<tr>
<th>Clinical Scenario</th>
<th>Non-contrast CT Head</th>
<th>Non-contrast MRI Brain</th>
<th>Contrast MRI Brain</th>
<th>Either/Or</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute persistent headache</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe progressive symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seizures/Status Epilepticus</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head trauma, GCS ≤ 8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unilateral hearing loss</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

*Doctor headache non-final examination

**Number studies per recommendation from Neurology

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

**Other Recommendations:
- If you’re evaluating for a new symptom rule-out, consider ordering CT angiogram.
- Pag’s Neurology with inquiries pertaining to other clinical syndromes.

Red Flags (for Acute New Onset Headache):
- Think of worst-case scenarios
- Meningitis/Subarachnoid- headache, fever, meningal signs, altered mental status, seizures. To DD: these features are present.
- Subarachnoid Hemorrhage - sudden onset, severe headache and/or neck pain, brief loss of consciousness at onset, pain is persistent for several hours before, diplopia, paresis, other focal neurological sequela. To DD if these features are present.
- Space Occupying Lesions - comma, abscess (very rare), subdural hematoma, TIA. To DD if altered mental status, focal neurological symptoms or signs, seizure.
RUAT Guidelines

Example Regional Guidelines Developed by RUAT for Hematuria

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
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

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

MR Most Common Procedures

Head or Brain
- 70551C - Brain w/o contrast
- 70553D - Brain wo/w contrast (STD)
- 70553F - IAC with/without contrast
- 207009 - Orbits with/without contrast
- 206997 - Sella/Pituitary with/without contrast
- 206998 - Brain & MRA without contrast
- 210925 - Brain & MRA without contrast
- 70544A - MRV Brain without

Chest/Breasts
- 70540A - Brachial Plexus without contrast
- 71550B - Chest without

Upper Extremity
- 73221L - RT Shoulder without contrast
- 73221G - LT Shoulder without contrast
- 73221R - RT Elbow without contrast
- 73221H - LT Elbow without contrast
- 73221K - RT Wrist without contrast
- 73221J - LT Wrist without contrast
- 73218G - RT Hand without contrast
- 73218E - LT Hand without contrast
- 73218M - RT Upper Extremity without contrast
- 73220M - RT Upper Extremity with/without contrast

Abdomen
- 74183H - Liver with/without contrast
- 74183G - Pancreas with/without contrast
- 74183F - Kidney with/without contrast
- 74181E - Adrenals without contrast
- 74183C - Abdomen with/without contrast (for other than listed)
- 74181B - MRCP
- 74185G - MRA Renal Arteries

Lower Extremity
- 73721O - RT Knee without contrast
- 73721P - LT Knee without contrast
- 73721M - RT Ankle without contrast
- 73721N - LT Ankle 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
- 73720N - LT Lower Extremity with/without contrast

Pelvis
- 72195B - Pelvis without contrast
- 72197B - Pelvis with/without contrast
- 72195F - Scrotum/Testes without contrast
- 73721W - Hips without contrast

Soft Tissue Neck
- 70540C - Neck without contrast
- 70543A - Neck with/without contrast
- 70543F - Nasopharynx without contrast
- 70547B - MRA Neck without contrast

Cervical Spine
- 72141B - CS without contrast

Thoracic Spine
- 72146B - T Spine w/o contrast
- 72157C - T Spine with/without contrast

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

Conclusion

Utility 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 complementary to and should enhance CDS systems
References


Thank You!

Contact Information:
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