



# Advanced Imaging Management AIM Workgroup

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## Findings and Recommendations

June 26, 2009

<b>Project Name</b>	Advanced Imaging Management
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<b>Workgroup Members</b>	Craige Blackmore, MD, Health Technology Clinical Committee; Robert Bree, MD, WA State Radiology Society; Brian Wicks, MD, WA State Medical Society; Fred Mann, MD, Hospital Association; Susie Dade, Puget Sound Health Alliance; Robert Karl, MD, WA Health Care Forum; Mark Whitaker, MD, Association of WA Health Plans; Gary Franklin, MD, Department of Labor & Industries; Jeff Thompson, MD, Department of Social & Health Services; Nancy Fisher, MD, Health Care Authority; Andrew Oliveira, MD, Multi-State Health Carrier and Lisa Plymate, MD, Primary Care Provider
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### **Purpose**

Washington state is leading efforts to use evidence based medicine to make health policy and coverage decisions. A new legislatively created workgroup with 13 members representing provider, payor, and quality organizations is charged with:

- identify[ing] evidence based best practice guidelines or protocols applicable to advanced diagnostic imaging services and any decision support tools available to implement the guidelines or protocols. Sec. 2(1)
- report its [workgroup] findings and recommendations to the governor and the appropriate committees of the legislature no later than July 1, 2009 Sec.2(5)

### **Background**

Impressive advances in imaging lead to enhancement in ability of physician to diagnose and treat disease. Several national studies and reports have documented a dramatic rise in the use of imaging, particularly advanced imaging: MRI, PET, CT, and cardiac nuclear services. However, the expansion in scanning has led to increased costs by government and other payers, but has not necessarily led to better health care or reduced mortality.

Common issues include unnecessary duplication of imaging, inappropriate use of tests for certain diagnosis; inferior equipment; experimental or investigational use; use by untrained practitioners; referral to physician owned imaging centers; and defensive medicine practices.

#### **Authorizing Legislation 2009 - ESHB 2105**

**Section 1** – Definitions

**Section 2** – Workgroup membership and tasks

**Section 3** – Requires state agencies to implement in direct purchased care

**Section 4** – All Medicare accreditation requirements apply to all state providers

## **Executive Summary**

AIM began meeting in May 2009. A **workgroup charter** and work plan were developed to identify the problem statement, purpose of the AIM, scope and limitations. Three primary activities followed to gather information to base the recommendations on: 1) gather agency data, 2) search for and rate imaging guidelines, and 3) review decision support solutions.

1. The public purchasers provided **utilization data** to identify high priority areas, which were also cross-referenced to another state's (Minnesota's ICSI) identified high priority areas. The three agency's data had high overlap among each other and with Minnesota's priority areas.
  - Eight MRI, CT, PET, and Cardiac Nuclear imaging areas represent 56% of advanced imaging and were identified as high priority, meaning any recommendations and agency action should at least include these high priority areas.
2. AIM approved a **guidelines review checklist** developed by Oregon Health Sciences University, MED project and based on international guideline standards. A search of the National Guidelines Clearinghouse was conducted and **guidelines were rated** on the rigor and transparency of evidence used to develop guidelines.
  - A total of 32 guidelines were reviewed, with 23 guideline development organizations represented, most being provider / specialty societies.
  - For the three checklist questions on rigor of development, set on a scale of Good, Fair, Poor:
    - 13 guidelines rated at least two "Good" and one "Fair".
    - Of the 13, 5 guidelines had all "Good" ratings.
    - These 13 higher scoring guidelines are spread over six of the eight high impact areas.
3. Provider associations and product developers with decision support tools that implement evidence based guidelines were invited to **provide materials**, and seven organizations responded to present to the workgroup.
  - In general, two "**program models**" with some variations were presented: Clinical Decision Support and Benefits Management. Both program models use a computer program that requires relevant patient information and proceeds through a series of questions/criteria related to imaging method, disease and/or medical condition. All program models indicate that they are evidence based and most cite ACR Appropriateness Criteria as a primary basis.
  - A primary distinction is the degree and method by which a payor's reimbursement policy is enforced, which generally is through voluntary education in the clinical decision support model and through prior authorization (permission) in the benefits management model.

Based on the information and resources gathered, the workgroup developed its recommendations to public purchasers requiring selection of evidence based best practice guidelines using the checklist, and implementation of a program of mandatory utilization management for high impact advanced imaging services.

The full AIM recommendations and further information, excerpted from staff reports, on the finding and outcomes of each of these steps follow. Additional information about the workgroup, meetings, and full materials are available at: <http://www.hta.hca.wa.gov/aim.html>

### ***AIM Workgroup Recommendations***

AIM Workgroup members crafted draft recommendations at their meeting on June 22<sup>nd</sup>. A review draft for comments was circulated, and a final draft was voted on via email with a majority (12 of 13 members) approving.

Public purchasers shall implement a consistent program of mandatory utilization management using evidence based guidelines and prospective review, where possible, for the high cost/high variability advanced imaging studies. The program should result in a satisfactory business case (balancing access, quality, and cost) for the State and public purchasers. In addition, the program should stress minimizing the administrative burden on ordering providers.

#### Recommendations on Evidence based guidelines or protocols

- Public purchasers will use the AGREE Checklist approved by AIM workgroup to identify and select guidelines
- Review of guidelines will be conducted periodically
- Guidelines will not supersede the decisions of the health technology clinical committee
- A vendor of a public purchaser must apply the guidelines chosen by the public purchaser

#### Recommendations on the Program, including criteria for decision tool and utilization management

- Applicability
  - Target utilization management intervention to identified advanced imaging of high cost/high variability
  - Apply to all providers, to the extent possible
- Program Components
  - Include incentives (for example, programs such as 'gold card')
  - Include denials (with opportunity for peer interaction)
  - Include provider education component
    - Provider performance reports
  - Minimize delays for approving requests that are consistent with evidence based guidelines
  - Meet State standards or URAC or NCQA criteria
  - Include a deployment and communications plan
- Evaluation component
  - Evaluate program's effects in 24 months initially and annually thereafter (cost, utilization trends, service reports, provider satisfaction)
  - Require a vendor of a public purchaser to provide quarterly data

**High Priority Advanced Imaging**

The AIM Workgroup reviewed the last available year of utilization data for the three health purchasing agencies direct purchasing, Department of Social and Health Services (Medicaid), Health Care Authority (Public Employee Health Plan), and Labor and Industries (Workers Compensation). The following imaging areas were selected based on utilization and relevance to the workgroup mandate (e.g. a high percent of excluded advanced imaging related to therapeutic use of PET for cancer, ultrasound, and mammography).

A total of eight areas were identified (MRI Brain and CT Brain were combined).

**Table 1. WA State Purchasing High Priority Advanced Imaging**

<b>Imaging Type and Body Region</b>	<b>All Agency Paid (annual)</b>	<b>All Agency Unit</b>	<b>Per Unit Cost</b>
MRI Cervical Subtotal	\$5,030,759	9,142	\$550
MRI Lumbar Subtotal	\$11,920,418	19,194	\$621
MRI Upper Joint Subtotal	\$7,974,280	13,084	\$609
MRI Lower Joint Subtotal	\$8,165,721	14,070	\$580
MRI Brain Subtotal	\$6,327,112	10,447	\$606
MRI Subtotal	\$39,418,291	65,937	\$598
CT Brain	\$2,421,023	13,762	\$176
CT Abdomen/Pelvis	\$10,477,615	39,259	\$267
Cardiac Nuclear Subtotal	\$3,316,845	17,264	\$192
PET Oncology Subtotal	\$1,789,879	997	\$1,795
<b>AI High Priority Total</b>	<b>\$57,423,652</b>	<b>137,219</b>	<b>\$600</b>
All Agency All Radiology (Professional Bills)	<b>\$115,398,090</b>	<b>809,439</b>	
All Agency Non-Xray Radiology (Professional Bills)	<b>\$102,699,465</b>	<b>472,235</b>	
Advanced Imaging - High priority % of non-xray professional	56%		29%

## **Decision Support Tools**

“Decision support tools” available to implement the evidence based best practice guidelines or protocols are not legislatively defined and could include a range of products from implementation criteria attached to a guideline to computer programs using evidence based criteria, to review services that use evidence based criteria.

The workgroup invited organizations that provide advanced imaging related criteria or products to provide brief materials and presentations at the June 2, 2009 meeting, summarized below. Additionally, a report appendix includes relevant excerpts from an information request conducted by OHSU where vendors described their product offerings, services, and prices.

A summary of the different decision support tool components as well as a listing of the Organizations are included in Table1, below. In general there were two “program models”: which will be referred to in this report as Clinical Decision Support and Benefits Management Systems. Aside from the table description, the “do it yourself” purchase of criteria is not further detailed.

Both program models use a computer program that requires relevant patient information and proceeds through a series of questions/criteria related to imaging method, disease and/or medical condition. Both program models indicate that they are evidence based and most cite ACR Appropriateness Criteria as a primary basis. The computer programs differ among vendors and models in specifics such as: display, order of arranging (e.g. by modality or condition); level of detail; alternatives. It is beyond the scope of this report and possible only by direct comparison of mostly proprietary algorithms to ascertain differences in individual criteria and whether those criteria, rigor of evidence level for each criteria, and “stringency” of the criteria.

The clinical decision support was originally purposed to support a provider at point of care in clinical decision making and is generally installed and connected to a provider’s electronic medical record, though some are web accessed. The benefit management system was originally purposed to support payors in determining medical appropriateness and fit within benefit design and is generally installed and connected to a payor’s utilization or claims support process, though some are web accessed. Both models now have been extended to be accessible to both payors and providers and allow different access and reporting that would support both business functions. Depending on the model, additional services to support the computer program are bundled or can be added on.

A primary distinction is the degree and method by which a payor’s reimbursement policy is enforced, which generally is through voluntary education in the clinical decision support model and through prior authorization (permission) in the benefits management model. However, both models can now accommodate these processes.

**Table 1: Decision Support Tools**

#	Support Tool Type	Description	Attributes	Model Example
	Criteria, algorithms, protocols	Produced with guidelines or based on others' guidelines. Can include decision trees; criteria; algorithms; or protocols for clinical decision making	<ul style="list-style-type: none"> <li>• Electronic or paper documents/web pages</li> <li>• Purchase or publicly available developed by public and private orgs</li> <li>• for use by provider, payor or health care organization</li> </ul>	Milliman Ambulatory Care guidelines (inc. outpatient radiology)
	Clinical decision support systems (CDDS) (can include radiology order entry)	Interactive computer programs designed to assist providers with medical decision making that are based on rules or logic modules (including evidence based guidelines).	<ul style="list-style-type: none"> <li>• Installed in provider offices or accessed by providers through the web</li> <li>• Distinction between access at Point of Order and Point of Care</li> <li>• Software purchase or license/subscription fee</li> <li>• Used by provider to decide on treatment/diagnostic</li> <li>• Most also provide reports to providers</li> </ul>	Nuance (RadPort -MGH) Medicalis Innovent Oncology
	CDDS – plus database	Same as above plus additional software for aggregating and reporting	<ul style="list-style-type: none"> <li>• Same as above plus</li> <li>• Decision support tool may include inquiry number for tracking or notification</li> <li>• Information and reports from multiple providers available to payor(s)</li> </ul>	ICSI HTDI Model using Nuance software Medicalis

#	Support Tool Type	Description	Attributes	Model Example
	Benefits management systems (also called Radiology Benefit management systems)	Interactive computer program designed to assist health plans in deciding appropriateness, medical need, or efficiency of health care procedure based on rules or logic criteria (including evidence based guidelines) under a health benefit plan.	<ul style="list-style-type: none"> <li>• Installed in payor organization (or contracted vendor) accessed through web</li> <li>• Software or license purchase</li> <li>• Used by payor to manage utilization and for reporting</li> <li>• Provider may access via web, phone, fax and use to review payment criteria or obtain permission</li> </ul>	CareCore National; MedSolutions
	Benefit management Services (also called utilization management or review)	Evaluation of appropriateness, medical need or efficiency of health care services for a health plan based on criteria (including evidence based guidelines). Often bundled with benefit management system. Services can include: <ul style="list-style-type: none"> <li>• Audit or retrospective review for adherence to criteria</li> <li>• Provider education</li> <li>• Provider incentive systems</li> <li>• Prior notification processing</li> <li>• Prior authorization processing</li> <li>• Related services for updates, call center, appeals, reports, etc</li> </ul>	<ul style="list-style-type: none"> <li>• Often bundled with system or embedded in system (see above)</li> <li>• Services provided by contract, typically on per member per month basis, some offer at risk component; some per review or other basis</li> </ul>	Qualis CareCore National; MedSolutions

## ***Evidence Based Guidelines Identification and Rating***

All workgroup members and stakeholders were invited to submit guidelines for the review. The primary additional source was a search of the National Guidelines Clearinghouse (NGC) which is a comprehensive database of evidence-based clinical practice guidelines and related documents sponsored by the Agency for Healthcare Research and Quality (AHRQ).

The NGC does not have an advanced imaging category, but for basic context, the “diagnosis” category, which lists all diagnostic interventions, contains 1,324 guidelines. Systematic, itemized searches were conducted for the eight high priority advanced imaging topics identified by the workgroup. In general, search criteria were broad and included the relevant imaging topic; date range for production or update within five years; and use of some evidence-review process in development. Original staff report Appendices includes individual search criteria and results. Each search resulted in an average of 30 guidelines with a total of 250 potentially relevant guidelines. These searches also identified the guidelines provided by stakeholders.

Search results were then reviewed and further narrowed based on relevance and duplication. An example of relevance would be that including “MRI” in key terms resulted in guidelines that contained the word “MRI” but were not necessarily related to the other key word such as “knee” or “upper joint”. Regarding duplication, during the search process it became apparent that many searches resulted in guidelines from a handful of the same guideline developers. For instance, the American College of Radiology (ACR), the Work Loss Data Institute, and the American Academy of Orthopedic Surgeons (AAOS) were very prominent guideline developers in many of these searches. Most organizations use the same methodology and include or reference an organizational methods statement applicable to all of their guidelines, used to streamline and standardize their process.

Because our staff inquiry is primarily focused on the rigor of guideline development and evidence quality, it isn’t necessary to review each of the individual ACR guidelines for instance, because ACR has a standard methodology document which does not vary and thus the rating for Section 1 did not change. However, due to the prominence of ACR in advanced imaging, staff did review at least one ACR guideline per high priority topic. Important to this workgroup, this provides a mechanism to apply a standardized evidence filter at a relatively high level (the organization’s methodology), to initially narrow the guidelines for eventual consideration or recommendation for agency implementation. The final number of guidelines included and reviewed is 32. See Appendix A for individual checklists.

Resources: The AIM Workgroup approved a guidelines review checklist that is based on a longer tool developed by AGREE, an international guidelines collaboration which includes participation by US’ AHRQ. [www.agreecollaboration.org](http://www.agreecollaboration.org) AGREE is dedicated to defining quality for guideline development, reporting, and assessment. Staff also referenced a series of articles “Rating the Quality of Evidence and Strength of Recommendations” published in the British Medical Journal and developed by GRADE (Grading of Recommendations Assessment, Development, and Evaluation) Working Group available at: [http://www.gradeworkinggroup.org/about\\_us.htm](http://www.gradeworkinggroup.org/about_us.htm). GRADE is also an international collaboration with US participation and focuses on “common, sensible, and transparent” approach to grading the quality of evidence and strength of recommendations.

Using the checklist provides a structured base of information for workgroup members to compare the development process and evidentiary basis of identified guidelines. HCA staff was tasked with reviewing identified guidelines against checklist sections 1 and 2. To prioritize work due to the limited timeframe, the staff focused on section 1-Primary Criteria - which are questions related to guideline development rigor. As time permitted and for those with fair or good Section

1 ratings, Section 2 was also completed. Section 2 addresses whether guideline scope and stakeholder involvement are defined.

**Primary Criteria:** Rigor of development (Section 1) relates to the process used to gather and synthesize the evidence, the methods to formulate the recommendations, and editorial independence. The guideline/ organization must be explicit about the search and selection of evidence, the rating or strength of that evidence, and how that graded evidence is correlated to guideline recommendations. Additionally, the guideline/ organization must state funding sources and conflicts of interests of members.

Note that the questions focus on transparency but do not impose any specific quality of evidence requirement. This is key to our ability to understand and follow the basis for both the evidence cited and the recommendations. High quality, evidence based guidelines describe search terms and inclusion criteria and their ability to maximize the number of relevant studies; have explicit study quality ratings linked to evidentiary hierarchy (study design) and study implementation (limitations, directness of evidence, etc); and clearly identify the linkage between the evidence ratings and recommendations. In our review, numerous guidelines received a Poor rating because they did not meet AGREE standards in clearly describing their search and study selection. Without this information, a potential user does not know whether all relevant studies were included and what the basis for a selected (or excluded) study is.

Note that a guideline developed with poor evidentiary rigor may still contain some individually reasonable or well supported recommendations; however, because of the development limitations, which of the recommendations are properly supported is not ascertainable. The reverse is also true: guidelines developed with excellent evidentiary rigor may still contain recommendations that are not appropriate for the workgroup's purpose. This initial sort identifies the organizations using comprehensive, unbiased, and clearly defined evidence standards. Secondary criteria can assist in assessing whether the context, scope, usability, and important outcomes are addressed such that the guideline would be applicable to the workgroup's task of identifying guidelines for use by state agency purchasers, but a review against those criteria was beyond the scope of the review.

#	High Priority AI Topic	Guideline Developer	Title	1.1 Rigor of Evidence	1.2 Rigor of Recommendation	1.3 Editorial Independence
1	Abdomen / Pelvis - CT	American College of Radiology (ACR)	Left Lower Quadrant Pain	Poor	Fair	Poor
2	Abdomen / Pelvis - CT	American College of Radiology (ACR)	Renal Trauma	Poor	Fair	Poor
3	Brain -MRI / CT	American Academy of Neurology (AAN)	Headache; Non-acute	Good	Good	Fair
4	Brain -MRI / CT	American College of Radiology (ACR)	Headache	Poor	Fair	Poor
5	Brain -MRI / CT	American College of Emergency Physicians	Neuro imaging and decision making in adult mild traumatic brain injury in the acute setting	Good	Good	Good
6	Brain -MRI / CT	Scottish intercollegiate Guidelines Network	Diagnosis and Management of headache in Adults	Good	Good	Good
7	Brain -MRI / CT	European Federation of Neurological Societies	Diagnosis and Treatment of Brain metastases	Good	Good	Fair
8	Brain -MRI / CT	New Zealand Guidelines Group (NZGG)	Traumatic Brain Injury: diagnosis, acute management and rehabilitation	Good	Good	Good
9	Cardiac Nuclear	American College of Cardiology (ACR) Appropriateness Criteria	Single-Photon Emission Tomography Myocardial Perfusion Imaging	Poor	Fair	Fair
10	Cardiac Nuclear	Am. Heart Association; Am. Stroke Association Stroke Council; Clinical Cardiology Council; Cardiovascular Radiology & Intervention Council	Early Management of adults with ischemic stroke	Poor	Fair	Fair
11	Cardiac Nuclear	European Society of Cardiology	Diagnosis and Treatment of Chronic Heart Failure	Poor	Fair	Fair
12	Cardiac Nuclear	American Heart Association (AHA) & American College of Cardiology (ACC)	Diagnosis and Management of chronic heart failure in the adult	Poor	Good	Fair
13	Cardiac Nuclear	National Heart Foundation of Australia, Cardiac Society of Australia and NZ	Guidelines for prevention, detection and management of chronic heart failure in Australia	Poor	Poor	Good
14	Cervical - MRI	American College of Radiology (ACR)	Chronic Neck Pain	Poor	Fair	Poor
15	Cervical - MRI	Work Loss Data Institute	Neck and Upper back (acute & chronic)	Good	Fair	Good

#	High Priority AI Topic	Guideline Developer	Title	1.1 Rigor of Evidence	1.2 Rigor of Recommendation	1.3 Editorial Independence
16	Cervical - MRI	Canadian Protective Chiropractic Association	Diagnostic Imaging practice guidelines for musculoskeletal complaints in adults, and evidence-based approach	Poor	Fair	Fair
17	Lower Joint- MRI	American College of Radiology (ACR)	Acute Trauma to the Knee	Poor	Fair	Poor
18	Lower Joint- MRI	American Academy of Orthopaedic Surgeons	Treatment of Osteoarthritis of the Knee	Good	Good	Fair
19	Lower Joint- MRI	University of Michigan Health System	Knee Pain or Swelling: Acute or Chronic	Poor	Poor	Fair
20	Lower Joint- MRI	Institute for Clinical Systems Improvement (ICSI)	Diagnosis and Treatment of Adult Degenerative Joint Disease (DJD)/Osteoarthritis (OA) of the Knee	Poor	Poor	Fair
21	Lumbar - MRI	American Academy of Occupational and Environmental Medicine	Low Back Disorder	Poor	Good	Good
22	Lumbar - MRI	American College of Radiology (ACR)	Appropriateness Criteria: Low Back Pain	Poor	Fair	Poor
23	Lumbar - MRI	North American Spine Society (NASS)	Diagnosis and treatment of degenerative lumbar spinal stenosis	Good	Good	Fair
24	Lumbar - MRI	American College of Physicians and American Pain Society	Diagnosis and treatment of low back pain	Good	Good	Good
25	Oncology - PET	Association of Comprehensive Cancer Care Centres	Non-small Cell Lung Cancer	Poor	Good	Good
26	Oncology - PET	National Institute for Clinical Excellence (NICE)	Diagnosis and Treatment of Lung Cancer	Good	Good	Fair
27	Oncology - PET	American College of Chest Physicians	Management of small cell lung cancer	Good	Good	Good
28	Oncology - PET	Cancer Care Ontario	Diagnostic Imaging in the Assessment of Metastatic/ Recurrent Ovarian Cancer	Poor	Fair	Poor
29	Oncology - PET	Scottish Intercollegiate Guidelines Network	Management of patients with lung cancer	Good	Good	Fair
30	Oncology - PET	National Comprehensive Cancer Network	Non-small Cell Lung Cancer	Poor	Good	Good
31	Upper Joint - MRI	American College of Radiology (ACR)	Appropriateness Criteria: Shoulder Trauma	Poor	Fair	Poor
32	Upper Joint - MRI	American Academy of Orthopedic Surgeons	Clinical guideline on diagnosis of carpal tunnel syndrome	Good	Fair	Good