**Washington State
Health Care Authority**

Advanced Imaging Management
Workgroup Report

Findings and Recommendations

**As Required by Engrossed Substitute House Bill 2105
Chapter 258, Laws of 2009**

August 2009

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Advanced Imaging Management Workgroup

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Purpose

Washington State is leading efforts to use evidence-based medicine to make sound health policy and coverage decisions.

This report is submitted in compliance with Engrossed Substitute House Bill (ESHB) 2105 which was signed by the Governor and enacted as chapter 258, Laws of 2009. The act directs the Health Care Authority (HCA) to convene a workgroup to:

- Identify evidence-based best practice guidelines or protocols applicable and decision support tools applicable to advanced diagnostic imaging services to be implemented by state purchased health care programs. Section 2(1).
- Report its findings and recommendations to the Governor and the appropriate committees of the Legislature no later than July 1, 2009. Section 2(5).

To meet the July 1 deadline, the HCA appointed the Advanced Imaging Management (AIM) workgroup immediately following enactment of the legislation. The 13-member workgroup representing health care provider, payor, and quality organizations held its first meeting on May 4, 2009 and completed its initial task of identifying evidence-based best practice guidelines and protocols prior to the July 1 deadline. The work product of the workgroup to date is electronically available on the HCA website at http://www.hta.hca.wa.gov/aim.html.

The legislation also directs the workgroup to explore the "feasibility of using the guidelines or protocols for state purchased health care services that are purchased from or through health carriers and all payors in the state by January 1, 2011, for the reimbursement of advanced diagnostic imaging services." The workgroup will complete this task prior to July 1, 2010, the statutory deadline for completion of its work.

Authorizing Legislation - ESHB 2105 / chapter 258, Laws of 2009

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

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Background

Technological advances in imaging enhance the ability of medical providers to diagnose and treat disease. Several national studies and reports document a dramatic rise in the use of imaging, particularly advanced imaging: magnetic resonance imaging (MRI), positron emission tomography (PET), computed tomography (CT), and cardiac nuclear services. The expanded utilization of scanning has led to increased costs by government and other payors, 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 diagnoses, inferior equipment, experimental or investigational use, use by untrained practitioners, referral to physician owned imaging centers, and defensive medicine practices.

Executive Summary

The AIM workgroup charter and work plan were developed to identify the problem statement, purpose, scope, and limitations of the AIM workgroup. To support the findings and recommendations, the AIM workgroup conducted the following research activities:

1. Agency Data

   The Department of Social and Health Services, Health Care Authority, and Department of Labor and Industries provided utilization data to identify high priority areas, which were also cross-referenced with high priority areas identified by the Institute for Clinical Systems Improvement (ICSI), a non-profit organization comprised of 54 medical groups and sponsored by seven Minnesota and Wisconsin health plans. There was a high overlap of the data from the three agencies and with the ICSI priority areas. See Appendix 1 for a summary of the State Agency Utilization – Advanced Imaging Priority Report.

   Eight MRI, CT, PET, and Cardiac Nuclear imaging areas represent 56% of the agency advanced imaging total costs. The AIM workgroup determined that any recommendation and agency action should at least include these eight high priority areas.

2. Search for and Rating of Advanced Imaging Guidelines

   The AIM workgroup identified and selected guidelines for the utilization of advanced imaging services for review by the workgroup. Workgroup members and stakeholders were invited to submit evidence-based guidelines. The primary additional source was the National Guidelines Clearinghouse (NGC), a comprehensive database of evidence-based clinical practice guidelines and related documents sponsored by the Agency for Healthcare Research and Quality (AHRQ).

   - A total of 32 guidelines for the use of the eight high priority advanced imaging areas were identified for review.
   - These guidelines were developed by 23 guideline development organizations. Most of these organizations are health care provider / specialty societies.

   See Appendix 2 for more information on the process used to identify guidelines for review.

   The AIM workgroup approved a guidelines review checklist to provide a structured base of information for workgroup members to compare the development process and evidentiary basis of identified guidelines. The workgroup approved a checklist developed by the Medicaid Evidence-based Decisions Project (MED) at the Oregon Health & Science University (OHSU). See Appendix 3. This checklist is based on a longer tool developed by AGREE, an international guidelines collaboration which includes participation by AHRQ.

   HCA staff was tasked with reviewing identified guidelines against the checklist. The guidelines were rated on the rigor and transparency of evidence used to develop the guidelines – the three primary criteria in Section 1 of the MED guidelines review checklist (See Appendix 3). The guidelines were rated as Good, Fair, or Poor for each of three checklist questions on rigor of development. To review the rating for each of the 32 guidelines see Appendix 2, Table 2.

- 11 guidelines had at least two "Good" ratings and one "Fair" rating.
- Of these 11 guidelines, five guidelines had all "Good" ratings.
- At least one of the 11 higher scoring guidelines applied to six of the eight advanced imaging high priority areas.

3. <u>Review Decision Support Solutions</u>

Provider associations and product developers with decision support tools that implement evidence-based guidelines were invited to provide materials. Seven organizations responded to present to the workgroup. See Appendix 4 for additional information on the decision support tools presented to the workgroup.

- In general, two "program models" with some variations were presented: Clinical Decision Support and Benefits Management.
    - o 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.
    - o All program models indicate that they are evidence-based and most cite the American College of Radiology (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 recommendations directing public purchasers to implement a consistent program of mandatory utilization management, including use of the guidelines review checklist to collectively establish evidence-based best practice guidelines for at least each of the eight high priority advanced imaging areas.

AIM workgroup members wrote draft recommendations at their June 22, 2009, meeting. A review draft for comments was circulated, and a final draft was voted on via email with a majority (12 of 13 members) approving.

AIM workgroup recommendations and the findings and outcomes of each of these steps are outlined in this report. Additional information about the workgroup, meetings, and full materials are available at: http://www.hta.hca.wa.gov/aim.html.

Advanced Imaging Management Workgroup Recommendations

<u>These are the recommendations as adopted by the AIM workgroup</u>:

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

Next Steps

1. <u>State Agency Implementation</u>

   State purchased health care programs are currently working together on implementation of a program of mandatory utilization management, including:

   - Selection of guideline(s) that meet the AIM workgroup criteria for use by agencies for at least each of the high priority areas; and
   - Review of current resources and planning for implementation either through new or existing resources, or contracting, with special emphasis on joint approaches.

2. <u>Feasibility Review – Extending Application of the Guidelines</u>

   During the next year the workgroup will explore the feasibility of using the guidelines for reimbursement of advanced diagnostic imaging services by state purchased health care services purchased through health carriers and all payors. The workgroup will complete this task and submit its findings and recommendations prior to July 1, 2010, the statutory deadline for completion of its work.

3. <u>Final Report</u>

   The Health Care Authority will submit a final report next summer detailing all findings and recommendations of the workgroup and the status of the state agencies' implementation of utilization management processes and guidelines for the reimbursement of advanced diagnostic imaging services.

Appendix 1

High Priority Advanced Imaging

This appendix is a summary of the information in the State Agency Utilization – AI Priority Report found on the HCA AIM project website.

The AIM workgroup reviewed the last available year of utilization data for direct purchasing at the following three health purchasing agencies:
- Department of Social and Health Services (Medicaid)
- Health Care Authority (Public Employees Health Plans)
- Department of 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 later combined).

Table 1. Washington State Purchasing High Priority Advanced Imaging

Imaging Type and Body Region	All Agency Paid (annual)	All Agency Units	Per Unit Cost
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
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
Advanced Imaging High Priority Total	**$57,423,652**	**137,219**	**$600***
All Agency All Radiology (Professional Bills)	**$115,398,090**	**809,439**	
All Agency Non-X-ray Radiology (Professional Bills)	**$102,699,465**	**472,235**	
Advanced Imaging High Priority Total as a Percentage of All Agency Non-X-ray Radiology (Professional Bills)	56%	29%	

*Average of the per unit cost for each imaging type and body region area.

Appendix 2

Evidence-based Guidelines Identification and Rating

This is a summary of the AIM Workgroup Guidelines Review Staff Report that has appendices including individual search criteria and results.

All workgroup members and stakeholders were invited to submit evidence-based guidelines for the review. The primary additional source was 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.

- 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."

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 Orthopaedic Surgeons (AAOS) were very prominent guideline developers in many of the searches. Most organizations use the same methodology and include, or reference, an organizational methods statement which is applicable to all of their guidelines and is 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. As an example, ACR has a standard methodology document which does not vary and thus the rating for primary criteria 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. 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.

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 AHRQ. AGREE can be found online at www.agreecollaboration.org and 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. GRADE is also an international collaboration with U.S. participation and focuses on a "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 the OHSU MED Project checklist (Appendix 3) 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 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.

Table 2. AIM Staff Guideline Ratings

#	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**	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**	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 (ACC) 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**	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**	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**	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**	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, 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**	Appropriateness Criteria: Shoulder Trauma	*Poor*	*Fair*	*Poor*
32	Upper Joint - MRI	**American Academy of Orthopaedic Surgeons**	Clinical Guideline on Diagnosis of Carpal Tunnel Syndrome	*Good*	*Fair*	*Good*

Appendix 3

MED PROJECT	Methodology Checklist: Guidelines

Guideline citation *(Include name of organization, title, year of publication, journal title, pages)*		

MED Topic:	Key Question No.(s), if applicable:

Checklist completed by:	Date:

SECTION 1: PRIMARY CRITERIA[1]

To what extent is there	*Assessment/Comments:*		
1.1	**RIGOR OF DEVELOPMENT: Evidence** • Systematic literature search • Study selection criteria clearly described • Quality of individual studies and overall strength of the evidence assessed • Explicit link between evidence & recommendations *(If any of the above are missing, rate as poor)*	GOOD	FAIR	POOR
1.2	**RIGOR OF DEVELOPMENT: Recommendations** • Methods for developing recommendations clearly described • Benefits/side effects/risks considered • External review	GOOD	FAIR	POOR
1.3	**EDITORIAL INDEPENDENCE** • Independence from funding source • Member conflict of interest identified	GOOD	FAIR	POOR

If any of three primary criteria are rated poor, the entire guideline should be rated poor.

SECTION 2: SECONDARY CRITERIA

2.1	**SCOPE AND PURPOSE** • Objectives described • Clinical questions described • Patients/population specified	GOOD	FAIR	POOR
2.2	**STAKEHOLDER INVOLVEMENT** • Relevant professional groups represented • Patients' views and preferences sought • Target users defined • Pilot tested among target users	GOOD	FAIR	POOR

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1 Editorial Independence is also a critical domain. However, it is often very poorly reported in guidelines. The assessor should not rate the domain, but write "unable to assess" in the comment section. If the editorial independence is rated as "poor", indicating a high likelihood of bias, the entire guideline should be assessed as poor.

SECTION 2: SECONDARY CRITERIA, Cont.			
2.3	**CLARITY AND PRESENTATION** • Recommendations specific, unambiguous • Management options clearly presented • Key recommendations identifiable • Application tools available • Updating procedure specified	GOOD FAIR POOR	
2.4	**APPLICABILITY** • Potential organizational barriers discussed • Potential cost implications considered • Monitoring/audit/review criteria presented	GOOD FAIR POOR	
SECTION 3: OVERALL ASSESSMENT OF THE GUIDELINE			
3.1	How well done is this guideline?	GOOD FAIR POOR	
3.2	Other reviewer comments:		

Description of Ratings: Methodology Checklist for Guidelines

The checklist for rating guidelines is organized to emphasize the use of evidence in developing guidelines and the philosophy that "evidence is global, guidelines are local." This philosophy recognizes the unique situations (e.g., differences in resources, populations) that different organizations may face in developing guidelines for their constituents. The second area of emphasis is transparency. Guideline developers should be clear about how they arrived at a recommendation and to what extent there was potential for bias in their recommendations. For these reasons, rating descriptions are only provided for the primary criteria in section one. There may be variation in how individuals might apply the good, fair, and poor ratings in section two based on their needs, resources, organizations, etc.

Section 1. Primary Criteria (rigor of development and editorial independence) ratings:

Good: All items listed are present, well described, and well executed (e.g., key research references are included for each recommendation).
Fair: All items are present, but may not be well described or well executed.
Poor: One or more items are absent or are poorly conducted

Appendix 4

Decision Support Tools

This appendix summarizes the [AIM Workgroup Decision Support Tools Staff Summary Report](#).

"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 have advanced imaging-related criteria or products to provide brief materials and presentations at the June 2, 2009, meeting, summarized below. Additionally, an appendix in the report referenced above 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 Table 3. In general, there were two "program models" that will be referred to in this report as Clinical Decision Support and Benefits Management Systems. The "do it yourself" purchase of criteria is described briefly in the table.

- 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: display, order of arranging (e.g., by modality or condition), level of detail, and alternatives.

The original purpose of clinical decision support was 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 available through the web.

The original purpose of the benefit management system was 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 available through the web.

Both models are now 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. Generally it is enforced 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 3. 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.	• Electronic or paper documents/web pages • Purchase or publicly available developed by public and private organizations • For use by provider, payor, or health care organization	Milliman Ambulatory Care guidelines (including outpatient radiology)
Clinical decision support systems (CDSS) (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).	• Installed in provider offices or accessed by providers through the web • Distinction between access at Point of Order and Point of Care • Software purchase or license/subscription fee • Used by provider to decide on treatment/diagnostic • Most also provide reports to providers	Nuance (RadPort -MGH) Medicalis Innovent Oncology
CDSS – plus database	Same as above plus additional software for aggregating and reporting.	Same as above plus: • Decision support tool may include inquiry number for tracking or notification • Information and reports from multiple providers available to payor(s)	ICSI HTDI Model using Nuance software Medicalis
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.	• Installed in payor organization (or contracted vendor) or accessed through the web • Software or license purchase • Used by payor to manage utilization and for reporting • Provider may access via web, phone, or fax and use to review payment criteria or obtain permission	CareCore National; MedSolutions

Table 3. Decision Support Tools (continued)

Support Tool Type	Description	Attributes	Model Example
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: • Audit or retrospective review for adherence to criteria. • Provider education. • Provider incentive systems. • Prior notification processing. • Prior authorization processing. • Related services for updates, call center, appeals, reports, etc.	• Often bundled with system or embedded in system (see above) • Services provided by contract, typically on per member per month basis, some offer at risk component; some peer review or other basis	Qualis CareCore National; MedSolutions