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Via e-mail to Todd Sells (tsells@naic.org)

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Lou Felice
Chair, NAIC Health Care Reform Solvency Impact Subgroup

Dear Mr. Felice:

WellPoint appreciates this opportunity to comment upon the definitions in Section 2718 of the Patient Protection and Affordable Care Act (PPACA)¹ that the NAIC is currently in the process of developing in order to provide recommendations to the U.S. Department of Health and Human Services (HHS). In this letter we want to focus on four items: 1) what activities should be included in the “activities that improve health care quality” criterion; 2) the “objectively measured and verified” criterion for quality activities; 3) the “hands on” criterion for quality activities; and 4) what constitutes “federal and state taxes or licensing and regulatory fees” under Section 2718.

WellPoint believes that the definition of quality activities proposed by the NAIC subgroup is much too restrictive, in that the proposed definition:

- Is not based on the broadly understood meaning of the relevant statutory language in PPACA as demonstrated by authoritative pronouncements from those quality organizations recognized by state and federal regulators such as the Department of Health and Human Services’ own Agency for Healthcare Research and Quality;
- Is inconsistent with the very authorities featured in the recent deliberations of the NAIC Health Innovations Working Group—which stressed innovation, incentives, and cost containment, broadly understood, as quality improvement drivers.
- Does not consider quality requirements imposed upon health plans or to be implemented by federal and state laws;
- Ignores the quality activities over the last two decades of organizations such as NCQA and URAC that are part of the PPACA legislative history;
- Will result in a dollar-for-dollar disincentive for health plans to invest in patient safety initiatives while medical errors are resulting in tens of thousands of deaths each year;
- Will result in far more fraud and abuse in the health care system by providing a disincentive to invest in anti-fraud activities;
- Attempts to discard health plan initiatives that improve quality and safety AND save healthcare dollars, despite the fact that the title of this section of PPACA is “Bringing Down the Cost of Health Care Coverage”, and
- Establishes a “hands-on” requirement for quality initiatives that will inhibit the development of a 21st Century Health Care system.

¹ Pub.L. 111-148 and 111-152.

WellPoint believes that objective measurement or verification of health plans' quality activities, if any, should be performed by organizations with long-standing expertise in assessing health plans' quality, such as NCQA.

WellPoint also believes that restricting health plans' quality activities to those that are "hands on" (i.e., delivered in face-to-face or telephonic contacts) fails to acknowledge the wired nature of our society and the importance that the Administration places on health information technology, as evidenced by laws such as the HITECH Act and Section 1104 of PPACA.

Finally, WellPoint believes that the NAIC has arrived at an unduly restrictive notion of the federal and state taxes or licensing and regulatory fees that health plans may permissibly exclude under Section 2718, ignoring the plain statutory language and creating an artificial distinction that will serve to drive up health plans' administrative costs at a time when health plans are expected to make every effort to decrease those costs.

Activities That Must Be Added To the Quality Definition

WellPoint believes that the following activities and programs must be added to the allowable "activities that improve health care quality" in Section 2718, as each has a well-established nexus to quality:

- Promotion of compliance with evidence-based medicine, widely accepted best clinical practice, or standards issued by accreditation organizations or government agencies. Such activities include, but are not limited to disease management, case and utilization management, wellness and prevention, and physician- and member-targeted member-specific decision support.
- Quality assurance activities, including those related to obtaining accreditation by NCQA or URAC and provider credentialing/network development and integrity, are also extremely important activities that improve quality of care.
 - For instance, an HHS fact sheet on "Quality Measures" cites NCQA as the lead framework reviewed for its determination of "desirable attributes of quality measures."²
 - And a senior HHS official testified to Congress last year that one of the "three basic dimensions" to "health care quality" is "structure," specifically "whether there are well-educated health professionals, appropriate hospitals, nursing homes, and clinics, as well as well-maintained medical records and good mechanisms for communication between clinicians. For example: Is the mammography equipment up to date and maintained properly? Are the cardiologists well-trained and board certified?"³
 - NAIC itself has long officially recognized the essential contribution to improving quality made by accrediting organizations. NAIC's 2004 Best Practices Organizations White Paper explained that accreditation "could serve as a 'short cut' to licensing" and that "[t]o the extent that a state measures an entity's 'quality' before deciding whether to grant a license, accreditation will tell the regulator more about the entity." **And NAIC's official Market Regulation Handbook explicitly instructs that "Market conduct analysts and examiners should be conversant with the standards required to qualify for membership in organizations such as . . . NCQA and URAC."**⁴
- Quality measurement and reporting on quality of care to entities such as NCQA and URAQ, as well as programs that measure and report physician-specific quality of care to physicians and publicly.
- Patient education regarding health conditions, diagnostic procedures, and treatments.
- Management of members' personal health information, such as providing members with access to personal health records (PHRs).
- 24-hour nurse health lines.

² http://www.qualitymeasures.ahrq.gov/resources/measure_use.aspx. (last visited 5/15/10)

³ <http://www.ahrq.gov/news/test031809.htm>. (Last visited 5/15/10)

⁴ NAIC Market Regulation Handbook (2009), Chapter 3, "Basic Analytical Tools," P. 34.

- Promotion of quality improvement through participation in local, regional or national collaboratives, such as the Colorado Clinical Guideline Collaborative, or through collaboration with quality organizations such as the National Quality Forum (NQF) or the Ambulatory Quality Alliance (AQA).
- Interpretation and translation services for members with limited English proficiency.
- Health information technology, including electronic health records, and creation and use of electronic channels for communication of member-specific information between health plans and providers to facilitate clinical decision support at the point of care.
 - This has been a main point of stress since the 1998 publication of the report of the President’s Advisory Commission on Consumer Protection and Quality in the Health Care Industry on which former Kansas Insurance Commissioner and current HHS Secretary Sebelius served as the NAIC representative. The report states that “[t]he health care industry will need to make a significant investment in health information systems to provide data on the individual and comparative performance of plans, facilities, and practitioners; help improve the coordination of care; advance evidence-based health care; and support continued research and innovation. Existing information systems are not adequate for these purposes.”⁵
- Provision of data to support health information exchanges.
- The support and provision of comparative effectiveness and outcomes research as part of a national agenda to determine the clinical effectiveness of health care services.
- Initiatives that support improved patient safety including hospital safety programs and drug and vaccine safety programs.
- Programs that target fraud and abuse, so that providers with a pattern of fraudulent or abusive behavior are taken out of the system, and so that services are appropriately billed by providers and reimbursed by insurers.

Reasons for Adopting a More Expansive Definition of “Activities that Improve Health Care Quality”

- A. The proposed restriction is restrictive, inconsistent with the framework of PPACA, and will disincentivize positive insurer programs

We respectfully suggest that the draft’s definition of “activities that improve health care quality” turns well established notions of productive and quality-improving health insurer programs—and the framework of the PPACA—on their head by creating narrow categories of inclusion; imposing a strong presumption against inclusion; creating a “hands on requirement” for all included activities; treating claims control and health quality improvement as mutually exclusive; and from day one, mandating that the activity in nature be precisely quantifiable. **These definitions will exclude a wide swath of core health insurer activities which relevant stakeholders have broadly understood—as demonstrated by existing authoritative literature, independent federal agencies, and in some cases federal law—to be fundamentally directed toward improving health care quality and patient safety.**

Health plans have for many years developed and promoted quality programs, many times taking the initiative to implement the programs well before Medicare has run a pilot program. For instance, Medicare is just starting to pilot pay for performance programs (as directed under the PPACA) with which health plans have successfully improved quality under for years. There will literally be a dollar-for-dollar negative incentive for health plans to provide this kind of innovative development of health care quality programs under the NAIC’s proposed framework. **Health insurers do not act as a pure pass-through, and it is activities which have both a cost control component AND a health care quality component which meet the very titles of the relevant parts of PPACA: “Bringing Down The Cost Of Health Care Coverage” and “Ensuring That Consumers Receive Value For Their Premium Payments.” And the common understanding of these**

⁵ <http://www.hcqualitycommission.gov/final/execsum.html>. (last visited 5/15/10)

terms at the time when Congress passed the Act was broad, not narrow, as described below. In fact, numerous studies demonstrate that payor pass-through without management yields both more expense and less quality care.

B. Leading authorities recognize a much broader concept of what constitutes an activity which improves health care quality than memorialized in the draft definitions.

Much of the discussions surrounding the drafting of PPACA and health care reform recognized a much broader concept of what is encompassed in quality initiatives. For at least the last two decades, organizations such as AHRQ, the Institute of Medicine, the National Quality Forum, and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO, now the Joint Commission) have been researching and publishing findings on what types of practices lead to higher quality health care.

Approximately a year ago the Senate Finance Committee Subcommittee on Health Care held a hearing entitled “What is Health Care Quality, and Who Decides?” In his opening remarks, Senator John “Jay” D. Rockefeller IV (D-WV) stated that “Creating a delivery system that rewards quality care and improves health outcomes is an absolutely essential part of health care reform. . . it is important to understand how all the public and private entities that deal with health care quality coordinate their efforts.”⁶ However, such public-private coordination was already ongoing at the time of the Senator’s remarks.

In June 2008, the National Priorities Partnership⁷ was convened, which is a joint public-private consortium convened by the National Quality Forum and jointly chaired by Donald Berwick of the Institute for Healthcare Improvement⁸ and Margaret O’Kane of NCQA. The purpose of the Partnership is to establish national priorities for healthcare quality and safety, and goals to achieve those priorities. Partnership members include 32 multi-stakeholder organizations that include consumers, purchasers and health plans, quality alliances, health professionals and providers, quality accreditation/certification groups, and public sector agencies such as CMS, CDC, AHRQ, and NIH. The Partnership repeatedly explains that quality and cost containment are interrelated in a manner that activities such as utilization review are designed to address. “It is estimated that 30 to 40 percent of health services represent waste. . . . We envision healthcare that promotes better health and more affordable care by continually and safely reducing the burden of unscientific, inappropriate, and excessive care, including tests, drugs, procedures, visits, and hospital stays.”⁹ **It is important to note that the National Priorities Partnership has now been legislatively authorized by PPACA.**¹⁰

The Partnership established 6 national quality priorities: patient and family engagement; population health; safety; care coordination; palliative and end-of-life care; and overuse.¹¹ Many of the quality programs currently established by health plans address these priorities. For example, cited as one type of overuse is “over-reliance on imaging scans that expose patients to radiation.”¹² Since 2007, WellPoint has had an Imaging Patient Safety Program in place that promotes more informed decision-making by physicians and patients by offering relevant information regarding the radiation exposure associated with diagnostic imaging procedures. This program is based on two key components: (1) providing educational resources to consumers and programs; and (2) measuring, monitoring and reporting to consumers and providers radiation exposure

⁶ March 18, 2009 hearing of Senate Finance Committee Subcommittee on Health Care.

⁷ <http://www.nationalprioritiespartnership.org/> (last visited 5/14/2010)

⁸ Dr. Berwick was recently nominated by President Obama to be the new CMS Administrator.

<http://www.whitehouse.gov/the-press-office/president-obama-nominates-dr-donald-berwick-administrator-centers-medicare-and-medi> (last visited 5/16/10)

⁹ http://www.nationalprioritiespartnership.org/uploadedFiles/NPP/About_NPP/ExecSum_no_ticks.pdf. (last visited 5/15/10)

¹⁰ See PPACA Sections 3011 – 3015.

¹¹ <http://www.nationalprioritiespartnership.org/Priorities.aspx>

¹² <http://www.nationalprioritiespartnership.org/PriorityDetails.aspx?id=598>

information. Medical studies have shown the increased risk of cancer to patients that results from overuse of imaging studies,¹³ and some imaging modalities have a high false-positive rate which would require further but unnecessary medical services to follow up and rule out a condition. **However, under the NAIC's proposed restrictive definition of quality activities, this imaging management program would likely be considered to be utilization review and thus not quality-related, even though it perfectly aligns with national quality priorities.**

We also believe that the proposed definition's presumptions against inclusion the inclusion of health insurers' activities that improve health care quality runs counter to the authorities cited by the NAIC's Health Innovations (B) Working Group. According to the NAIC minutes,¹⁴ one of the highlights of the Working Group's discussion was a presentation by the Robert Wood Johnson Foundation's State Coverage Initiatives Deputy Director. This Foundation is a well-recognized authority, linked to by the Department of Health and Human Services quality initiatives webpage.¹⁵ This presentation's primary focus was on the "several approaches that states have taken to attempt to contain costs while improving the quality of health care in the state. Nine states have created cost and quality councils to coordinate these efforts."

- Cost containment and quality of care were inextricably linked in this presentation, which stressed as "root problems" "inappropriate and/or overutilization of medical care/good new technologies"; "patients' lack of price sensitivity"; and "incentive mis-alignment," among others; and stated that key state initiatives "work with both providers and insurers to improve efficiency and reduce overall health care costs" and "address access, systems improvement, cost containment simultaneously."

Similarly, a May 30, 2008 hearing held by the Health Innovations Working Group focused on the link between cost controls and healthcare quality, and featured a warning from the Chair of the American Academy of Actuaries State Health Committee that, if in medical loss ratios, "cost-containment and disease management programs [are] not ... counted as medical expenses, [it would] mak[e] them difficult to provide while meeting minimum medical loss ratio requirements."¹⁶

C. Federal law and regulation has legislatively legitimized a wide range of quality activities

PPACA is rife with quality initiatives and programs, including but not limited to the following:

- a) Programs that address racial and ethnic disparities. (PPACA Section 4302)
- b) Programs health plans and sponsors of self-funded health plans are required to report to HHS and to enrollees under Section 2717 of PPACA.
- c) Comparative effectiveness research (PPACA Sections 6301-6302)
- d) Quality measures established pursuant to PPACA Sections 3013 – 3015
- e) Establishment of Centers of Excellence (PPACA Section 10410)
- f) Wellness programs (Sections 2717 and 4303 of PPACA)
- g) National Strategy to Improve Healthcare Priorities (Sections 3011 - 3015 of PPACA)
- h) Activities that complement quality measures established under the health care quality improvement program in Section 3501 of PPACA
- i) Medication management (MTM) in treatment of chronic disease (Section 3503 of PPACA)
- j) Pay for performance (PPACA Sections 3001- 3008)
- k) Payment bundling (PPACA Section 3023)
- l) Patient centered medical homes (PPACA Section 3602)

¹³ See Wang, S., "CT Scans Linked to Cancer," *Wall Street Journal*, December 15, 2009, found at:

<http://online.wsj.com/article/SB126082398582691047.html> (last visited 5/15/10); and Smith-Bindman, R., et al., "Radiation Dose Associated With Common Computed Tomography Examinations and the Associated Lifetime Attributable Risk of Cancer," *Arch Intern Med.* 2009;169(22):2078-2086.

¹⁴ 2008 NAIC Proc. 1st Qtr., p. 7-1. March 29, 2008 Health Insurance and Managed Care (B) Committee minutes.

¹⁵ <http://www.hhs.gov/ophs/initiatives/quality/system> (last visited 5/15/10)

¹⁶ Minutes of Health Innovations (B) Working Group, May 30, 2008.

- m) Medicaid quality programs in Sections 2701 – 2707 of PPACA
- n) Hospital readmission reduction program (PPACA Section 3025)

Additionally, CMS has established quality-related programs in Medicare and Medicaid, including the initiatives on hospital and healthcare acquired infections and wrong surgeries.¹⁷

WellPoint believes that if a quality program is authorized or required by federal law, including PPACA, private health insurers' activities aligning with such programs must be permitted to be included in the Section 2718 quality activities definition. To decide otherwise will mean that these important programs will cease to be offered in the private health insurance market as insurers look to reduce their administrative expenses.

D. Relating the definition to entities charged with establishing what constitutes quality

We respectfully suggest that NAIC and HHS should look to the pronouncements of an HHS subagency, the Agency for Healthcare Research and Quality (AHRQ). AHRQ is the primary federal agency charged with improving the quality, safety, efficiency, and effectiveness of health care.^{18,19} AHRQ has established a National Quality Measures Clearinghouse (NQMC)²⁰, a public repository of evidence-based quality measures. The clearinghouse relied upon the Institute of Medicine's definition of quality of care as "the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."²¹

A NQMC fact sheet on "Quality Measures"²² recognizes that quality measures may appropriately be used for internal quality improvement programs, such as the NCQA accreditation for managed health plans. But a health insurer's expenses for NCQA accreditation would likely not be included in the current proposed NAIC definition, nor would any network development, utilization review, or other activities which clearly meet the NCQA parameters. **Thus, the draft NAIC recommendations to HHS are on a path towards disagreeing with and disregarding the recommendations of HHS' own agencies with respect to quality activities.**

¹⁷http://www.cms.gov/HospitalAcqCond/02_Statute_Regulations_Program_Instructions.asp#TopOfPage
http://www.cms.gov/HospitalAcqCond/06_Hospital-Acquired_Conditions.asp#TopOfPage

Medicare National Coverage Determinations 140.6, 140.7, and 140.8 (eff. January 15, 2009), in *Medicare National Coverage Determinations Manual* Chapter 1, Part 2, pp. 42-46, found at:

http://www.cms.gov/manuals/downloads/ncd103c1_Part2.pdf

See also PPACA Section 3013(f) requiring the Secretary to publicly report data on hospital acquired infections.

¹⁸ <http://www.ahrq.gov/about/profile.htm>.

¹⁹ We note that in a recent letter to HHS Secretary Sebelius, Sen. Rockefeller agrees that AHRQ should be looked to for guidance in determining the definition of "activities that improve health care quality."

http://www.naic.org/documents/committees_lhatf_ahwg_100510_5_07_10_Letter_to_Sebelius.pdf (last visited 5/14/10)

²⁰ Found at www.qualitymeasures.ahrq.com (last visited 5/13/10).

²¹ Institute of Medicine, Committee to Design a Strategy for Quality Review and Assurance in Medicine. Lohr KN, editors. *Medicare: a strategy for quality assurance / Committee to Design a Strategy for Quality Review and Assurance in Medicare*, Division of Health Care Services, Institute of Medicine. Vol. 1, Report of a study. Washington (DC): National Academy Press; 1990 May. 468 p.

²² http://www.qualitymeasures.ahrq.gov/resources/measure_use.aspx (last visited 5/14/10).

Suggested Approach

We would like to suggest that there is a simple, objective way, based on medical science and literature, to capture “activities that improve health care quality”: Rely upon the pronouncements of federal agencies with responsibility for quality standards that have determined, and the provisions of federal and state law that have enacted, what programs and activities foster better quality health care. We suggest that, **at a minimum**, health plans be allowed to include as quality activities for MLR calculation purposes any items that fall within the following categories, and that these categories be considered a “safe harbor” for purposes of Section 2718 MLR reporting and rebate calculation:

- Quality measures pronounced by federal agencies;
- Quality measures that are public program initiatives;
- Quality measures that are required by federal or state law.

Because these activities are based on federal guidance and/or federal or state law designating them as “improving health care quality” or are established with the explicit purpose of “improving health care quality,” there is a solid legal foundation upon which the items **must be** captured by the definition.

We attach, as appendices at the end of this letter, further information about WellPoint quality programs falling into one or more of these categories. Below is a discussion of a few selected examples in each category. In the interest of time, we have chosen only several of our programs to highlight, but there are many more such quality programs at WellPoint that could be discussed.

Example of a Federal Agency Pronouncement and Public Program Initiative on Quality: Preventable Adverse Events

In August 2007, the Centers for Medicare and Medicaid Services, after receiving input from a number of groups and organizations, announced that Medicare will no longer pay for charges related to a list of 10 hospital acquired conditions. This change became effective on October 1, 2008.

In addition, in 2009 CMS stated it would not pay for any charges related to “wrong surgery”—wrong site, wrong procedure, or wrong patient—because these services are considered not medically appropriate and necessary and, therefore, are excluded from Medicare coverage.

At around the same time as CMS’ initial announcement, private payers began developing their own programs to align with the Medicare program. In 2007, WellPoint started its own program to address preventable adverse events. This program was piloted in Virginia, where, as in the Medicare program, neither WellPoint nor our members would be required to pay claims for the preventable adverse events identified by CMS. Effective October 1, 2008, WellPoint expanded this program enterprise-wide, and has also incorporated CMS’ policy on “wrong surgery.” Subsequently all Blue Plans have also aligned their programs with the CMS program. Further details are found in **Appendix A**.

Through a focus on patient safety, WellPoint is committed to working collaboratively with network physicians and hospitals to ensure that physicians and hospitals are identifying preventable adverse events and implementing appropriate processes, technologies, and strategies to prevent adverse events and to enhance the quality of care received by not only WellPoint members but also all patients receiving care in these facilities.

Examples of Federal Legislative Quality Requirements:
Comparative Effectiveness Research and Drug Safety Program

A patient-centered outcomes research institute responsible for performing comparative effectiveness research is formally established in PPACA Section 6301.²³ The purpose of the Institute, as set forth in PPACA, is to assist patients, clinicians, purchasers, and policy-makers in making informed health decisions by advancing the quality and relevance of evidence concerning the manner in which diseases, disorders, and other health conditions can effectively and appropriately be prevented, diagnosed, treated, monitored, and managed through research and evidence synthesis that considers variations in patient subpopulations, and the dissemination of research findings with respect to the relative health outcomes, clinical effectiveness, and appropriateness of medical treatments, services, and items.

Since at least 2007, WellPoint has engaged in its own comparative effectiveness research. One example is the published work we performed in collaboration with several medical societies and several WellPoint providers that developed real world evidence on the comparative effectiveness of various asthma controller medications.²⁴ A copy of this paper is attached in **Appendix B**.

Additionally, the FDA Amendment Act of 2007 mandated the development of a national active surveillance system by the FDA with key milestones of having 10 million lives by 2010 and 100 million by 2012. Along with a handful of other organizations (Harvard Medical School, eHealth Initiative and Ingenix's I3Drug Safety), WellPoint also collaborated with former FDA Commissioner and CMS Administrator Mark McClellan at the Brookings Institution to develop a white paper on the key components and core principles necessary for the success of the FDA's Sentinel Initiative. A summary of this document was published in the New England Journal of Medicine.²⁵

The FDA issued an RFP in the summer of 2009 looking for proposals from collaborating organizations to build the initial framework for what they believe will eventually be the FDA Sentinel System. There were a number of applicants for the contract. Our collaboration, led by Richard Platt from Harvard Medical School/Harvard Pilgrim won the bid. WellPoint is the largest data environment represented under the contract and is heavily involved in the leadership of the collaborative. Other health plans involved include Kaiser, Cigna, Humana and several of the smaller integrated systems including Henry Ford, Lovelace Clinical and Group Health. AHIP is also a collaborator along with a large number of academic institutions across the country.

WellPoint has developed its Healthcare Safety Sentinel System (HSSS) to address one of the health care system's most pressing concerns: the lack of knowledge on the safety of health care products and services. The HSSS is an "active" surveillance system, as opposed to the FDA's current Adverse Event Reporting System (AERS) system, which is "passive" in that it depends on volunteer reporting by the community. Our first utilization of the HSSS is for the monitoring of the safety of the H1N1 Vaccine, a project entitled PRISM that is in collaboration with AHIP and HHS/CDC. A more complete summary of the HSSS also appears in **Appendix B**.

²³ There was, however, a Federal Coordinating Council for Comparative Effectiveness Research established under section 804 of Division A of the American Recovery and Reinvestment Act of 2009 (42 U.S.C. 299b-8), which terminated upon the effective date of the PPACA. See PPACA Section 6302.

²⁴ Tan, H., Sarawate, C., Singer, J., Elward, K., Cohen, R., Smart, B., Busk, M., Lustig, J., O'Brien, J., and Schatz, M., "Impact of Asthma Controller Medications on clinical, Economic, and Patient-Reported Outcomes," *Mayo Clin Proc.* 2009;84(8):675-684.

²⁵ "The New Sentinel Network – Improving the Evidence of Medical Product Safety." *N Engl J Med*, August 13, 2009 36:7.

Example of Federal Program Quality Projects and Pilots: Medicare Value Based Purchasing (Pay for Performance)

The pay for performance program initiative by CMS has been developing over the past several years. It was outlined and requested by CMS in its November 2007 Report to Congress²⁶ but not legislatively authorized until the passage of PPACA in March 2010.²⁷ Even with such legislative authority, the program does not begin until 2013.

At WellPoint both physicians and hospitals are increasingly engaged in quality improvement pay for performance programs. In fact, WellPoint has engaged hospitals in quality performance programs in California, Colorado, Connecticut, Georgia, Indiana, Kentucky, Maine, Missouri, New Hampshire, New York, Ohio, and Virginia. In our Virginia program, we saw improvements in performance and reduction in variation around the measure of how quickly a patient's blood vessel is opened during a cardiac event, resulting in more rapid response times. This means that patients are receiving proper care more quickly. In Indiana, Kentucky, and Ohio, WellPoint rewards hospitals for quality goals including decreasing mortality and return-to-surgery rates for patients undergoing coronary artery bypass grafts. Our efforts in Virginia earned WellPoint the 2008 John M. Eisenberg Patient Safety and Quality Award for Innovation in Patient Safety and Quality at the Local Level.²⁸ The John M. Eisenberg Patient Safety and Quality Award was established by the National Quality Forum and the Joint Commission (previously known as JCAHO), and recognizes major achievements of individuals and organizations in improving patient safety and health care quality. The WellPoint program was also highlighted in a Joint Commission article.²⁹

Example of State Legislative Requirements on Quality: NCQA Accreditation, Provider Credentialing, and State-Required Quality Assurance Programs

Many states have laws requiring health plans to institute quality measures. A common requirement is for health plans to undergo, and receive certain scores on, NCQA accreditation before they may market their products in the jurisdiction.³⁰

Provider credentialing is also required by states (as well as Medicare). Ensuring that network physicians and other healthcare providers actually do have appropriate professional licenses, board certifications, and have not had actions reported to the National Practitioner Data Bank is necessary to assist members in obtaining quality health care from network providers. NCQA has established standards for approving the credentials of physicians wishing to join a health insurer's network, and many states refer to those standards in their laws.

Other states also require managed care health plans to institute quality assurance programs, designed to support quality health care and safety for patients who patronize network physicians. For example, the state of Georgia administrative regulations for quality requirements in managed care plans fall in a section entitled the

²⁶ U.S. Department of Health and Human Services Centers for Medicare & Medicaid Services, Report to Congress: Plan to Implement a Medicare Hospital Value-Based Purchasing Program, November 21, 2007, found at: <http://www.cms.gov/AcuteInpatientPPS/downloads/HospitalVBPPlanRTCFINALSUBMITTED2007.pdf> (last visited 5/13/10).

²⁷ See Sections 3001 - 3008 of PPACA.

²⁸ http://www.jointcommission.org/NewsRoom/NewsReleases/nr_09_25_08.htm
<http://www.jointcommission.org/PatientSafety/EisenbergAward/> (last visited 5/15/10)

²⁹ Gilbert, L., Walker, R., Krebs, R., and Barger, K., "Aligning Hospital and Physician Performance Incentives: A Shared Success Model," Joint Commission Journal on Quality and Patient Safety, vol. 34, no. 12, pp. 703-706(4) (December 2008).

³⁰ See, e.g., the Commonwealth of Massachusetts' regulatory requirement in 211 CMR sec. 52.00 et seq., "Managed Care Consumer Protections and Accreditation of Carriers, which requires carriers to obtain NCQA accreditation before they may market health benefits in that jurisdiction.

“Patient Protection Act.”³¹ The Patient Protection Act regulations have been a part of Georgia law since 1998.³² Under those regulations, plans must submit to the Georgia Department of Insurance their quality assurance programs. Specifically, GAC section 120-2-80.08(2) provides that

(2) The managed care entity must demonstrate, to the satisfaction of the Commissioner, that its quality assurance program includes organizational arrangements and ongoing procedures for the identification, evaluation, resolution and follow up of potential and actual problems in health care administration and delivery to enrollees. The program should include, but not be limited to procedures to:

- (a) monitor and resolve complaints;
- (b) **monitor provider performance;**
- (c) monitor patient satisfaction;
- (d) **establish appropriate quality indicators based on current standards of the relevant health care profession;**
- (e) **meet reasonable thresholds with regard to quality indicators;**
- (f) **credential network providers according to established standards;**
- (g) ensure access to network providers by maintaining sufficient numbers of primary care physicians and other types of providers within the managed care entity's service area; and
- (h) **detect both under utilization and over utilization of services.**

[Emphasis added.]

It is evident from this regulation and other laws and regulations³³ that the states have a longstanding history of requiring health insurers to adopt and implement health care quality practices in their organizations and in their network arrangements, and that insurer quality assurance programs, provider credentialing, and utilization management are all activities that the states acknowledge are directly related to improving the quality of health plan enrollees. Insurers should thus be able to put expenses from these legally-required activities into the quality category for purposes of the MLR calculation.

The “Objectively Measured and Verified” Criterion in the Proposed MLR Reporting Exhibit

There is no requirement in PPACA that the quality activities in Section 2718 be objectively measured and verified, as proposed in the draft NAIC MLR reporting exhibit. Similarly, the quality activities outlined in Section 2717 that health plans will be required to report annually to HHS and to enrollees do not require that they be objectively measured and verified.

However, to a great extent the independent, national organizations of NCQA, DMAA and URAC have already been engaged in a similar process of objective measurement, assessment and verification of quality measures for health plans. NCQA in particular has accreditation programs for health plans that build standards and performance measures for health plan quality management and improvement, as well as HEDIS measures that evaluate areas of care. In PPACA, Congress has recognized NCQA as a reputable accreditation organization that will accredit Medicare Advantage special needs plans.³⁴ We recommend that NCQA and

³¹ GAC 120-2-80, et seq.

³² The legislative findings of the Patient Protection Act statute, OCGA sec. 33-20A-2, state in pertinent part that “it is a vital government concern that the citizens of the State of Georgia have access to quality health care services.”

³³ See, e.g., Indiana Code sec. 27-13-6 (eff. 1994), et seq. (HMOs required to establish procedures based on professionally recognized standards to assess and monitor the health care services provided to enrollees of the organization; HMOs required to have an ongoing internal quality management program to monitor and evaluate the health care services they provide, which must include a written statement of goals and objectives emphasizing improved health status in evaluating the quality of care rendered to enrollees, as well as a system for credentialing providers and performing peer review activities); Wis Admin Code sec. 9.40 (eff. 2000) (requiring managed care plans to adopt quality assurance plans designed to reasonably assure that health care services provided to plan enrollees meet the quality of care standards consistent with prevailing standards of medical practice in the community). [Emphasis supplied.]

³⁴ PPACA Section 3205(e).

other independent national quality assurance organizations be named as the entities responsible to measure and verify health plans' quality activities under Section 2718.

The "Hands On" Criterion in the Proposed MLR Reporting Exhibit

Additionally, neither Section 2717 nor 2718 requires that as a precondition of an activity improving health care quality, that the activity be "hands on,"³⁵ as would be required by the draft NAIC proposal. Importantly, in the detailed provision on wellness and prevention programs in Section 2717 (b), the law specifically affirms that "web-based intervention efforts" will be an acceptable method of delivering these type of programs. If health insurers are prohibited from including as quality activities in the MLR calculation quality programs that rely in part on web-based tools, then it is likely that insurers will stop offering these programs, even though they otherwise could have demonstrably improved a member's quality of health care. Furthermore, there would be a legal contradiction if health plans could not consider activities that improve health care quality just because they are not "hands on," despite the fact that in other areas of federal law and/or federal agencies have considered those activities to be instrumental in improving health care quality.

It is not reasonable in our wired society to require that quality programs be delivered only in person or by phone, particularly if the insurer can demonstrate a clear improvement in healthcare quality by employing other methods. Web-based tools enable a "member-directed" experience allowing members to participate in programs according to their schedule and preferences. For example, in our disease management programs it is sometimes a challenge to get members to participate via phone outreach. Enabling use of web-tools adds to the resources at an insurer's disposal to engage members in managing their chronic conditions, and there is a demonstrated improvement in health care quality despite a potential lack of "hands-on" effort. It is critical that the federal government not—through MLR definitions—inhibit the development of a 21st Century health care system.

Also, as technology advances, there are legitimate alternative channels or media that insurers could use to educate their members. Two examples of WellPoint programs in which electronic information delivery (via web portal or secure e-mail) could be useful and save on administrative expenses are medical care alerts and information on certain types of elective surgeries. Care alerts are sent when medical care gaps in services provided to members are identified, based on evidence-based medical standards. An example is if in the management of a diabetic, the managing physician did not order a Hemoglobin A1C test twice a year. Once the care gaps are identified, communications are sent to members or providers or both, depending on the type of care gap identified. Currently WellPoint provides the care alerts via U.S. Mail, but providing them electronically would result in administrative cost savings as well as ensure that the alert was always readily available to both the member and provider, should they wish to later consult it.

Additionally, WellPoint provides information to help members be better informed on the pros and cons of certain treatments before they choose to undergo a surgical procedure. WellPoint has just launched a test program supplying members with an educational video on low back surgeries, but it would be just as if not more useful for a member to be able to view the video online.

³⁵ We note that although the exhibit instructions for line 5.1 in one category equate "hands on" with face-to-face or telephonic contact, it is unclear whether "hands on" is used in the same fashion throughout the categories of line 5.1 activities in the instructions.

The PPACA's Definition of Taxes and Fees is Broad

The PPACA Clearly Permits Insurers to Exclude All Federal and State Taxes or Licensing and Regulatory Fees" from the MLR Calculation in Section 2718

In reviewing the NAIC HCRSI workgroup's latest draft of the MLR supplementary exhibit, we are concerned about lines 1.5 and the related instructions, which give insurers credit in the MLR calculation for only certain kinds of federal taxes. Line 1.5 refers to "federal income taxes allocated to premiums," which the instructions clarify is to "[i]nclude federal income taxes allocated to premium and not related to other aspects of a company's operations (e.g., taxes on investment income and capital gains)." [Emphasis added] Moreover, on line 1.7 the exhibit erroneously translates what the statute terms "licensing or regulatory fees" into "regulatory authority licenses and fees." We are troubled by these artificial distinctions and translations, because they disregard the express language of the statute and do not express Congress' intent in enacting PPACA.

All Federal and State Taxes and Licensing or Regulatory Fees are included in PPACA

The clear language of PPACA excludes from the MLR calculation in Section 2718 "Federal and State taxes and licensing or regulatory fees." There is no qualification in the law that such taxes and fees must relate to premiums; there is no qualification whatsoever. Because no types of taxes and fees are excluded, every type of federal or state tax and licensing or regulatory fee that insurers pay must necessarily be included.

It is important to recognize that failing to permit all federal and state taxes to be excluded from the MLR calculation will place an undue burden on for-profit health insurance companies and HMOs as they attempt to calculate the artificial allocation of taxes as proposed by the exhibit. This will create an unlevel playing field in health insurance markets, since for-profit insurers will have to bear the additional administrative expense of making these allocations, as it is not something which insurers do today. We do not believe that this was Congress' intent in enacting PPACA, and we do not think that imposing additional administrative expense on health insurers at a time when the public is sensitive to insurers' administrative expenses is good public policy.

The NAIC's interpretation also lays aside the fact that, throughout PPACA, Congress was very intentional and deliberate about which types of insurers and HMOs are subject to which statutory requirements. For example, in Section 9010 imposing the new insurer fee, expressly excluded from application of that fee (in whole or in part) are entities that are non profit and for which

no part of the net earnings [] . . . inures to the benefit of any private shareholder or individual, no substantial part of the activities of which is carrying on propaganda, or otherwise attempting, to influence legislation (except as otherwise provided in section 501(h) of the Internal Revenue Code of 1986), and which does not participate in, or intervene in (including the publishing or distributing of statements), any political campaign on behalf of (or in opposition to) any candidate for public office.

Another example is in Section 1334 relating to the multi-state plans offered by OPM, where the HHS Secretary must ensure that at least one contract is entered into by a non-profit entity.

Thus, Congress clearly indicated in PPACA when it meant non-profit insurers and when the distinction between for-profit and non-profit insurers was irrelevant to application of a certain legal provision. Clearly the tax exclusion in Section 2718 is not a case where Congress intended to draw any distinction between

insurers. The clear unambiguous language of PPACA states that all insurers can exclude federal and state taxes regardless of their profit status under federal tax law.

“Licensing and regulatory fees” are not equivalent to “regulatory authority licenses and fees.”

We are troubled by the NAIC apparently equating what PPACA Section 2718 calls “licensing and regulatory fees” with the exhibit’s terminology on line 1.8 of “regulatory authority licenses and fees.” The instructions for this line detail that only “[a]ssessments to defray operating expenses of any state insurance department” are included, and excluded are both “[f]ines and penalties of regulatory authorities” as well as “[f]ees for examinations by state departments.”

Again, the NAIC workgroup places a modification on the statutory language that is unwarranted and unduly restrictive. Insurers are subject to a multitude of licensing and regulatory fees³⁶ and are completely unaware whether the monies collected go to support the operating expenses of state insurance departments, go into state general revenue, or are otherwise allocated by the state. It would be impossible for insurers to try and discern which fees would be excluded by the exhibit, and which would not. If Congress had meant that the only licensing and regulatory fees that could be excluded were those that go to shore up state insurance department operating expenses, it would have specifically said that in Section 2718. That it did not indicates that the NAIC’s interpretation is unduly restrictive.

Additionally, there can be no question that fees imposed upon health insurers for the costs of market conduct or financial examinations performed by state insurance departments or their agents are “regulatory fees” that insurers should be able to exclude in the MLR calculation. It is unfair as a matter of policy to require insurers to place in the administrative cost category fees over which the insurer has no control, and will again serve only to drive up insurers’ administrative costs.

³⁶ Such fees include, but are not limited to, the following:

- Financial regulation fee
- Annual statement filing
- Rate and form filing fees
- Holding company filings (Forms A, B, C, D, etc.)
- Initial certificate of authority applications
- Renewal of certificate of authority
- Original filing of and amendments to articles of incorporation and bylaws
- Filing reinsurance agreements
- Filing management agreements
- Costs/expenses of financial and market conduct examinations

Conclusion

In sum, WellPoint believes that the NAIC subgroup must acknowledge and rely upon previous efforts in the health care quality field, both by organizations and by health plans aligning with the organizations, in order to come up with a correct definition of what activities are included in “activities that improve health care quality.” WellPoint also believes that health insurers must be able to exclude from the MLR calculation all federal and state taxes and licensing or regulatory fees, as clearly stated in PPACA.

WellPoint appreciates this opportunity to comment on these important matters before the NAIC, and looks forward to working with the NAIC and HHS on implementation of PPACA over the next several years. Should you have any questions or wish to discuss our comments further, please contact Tony Mader at (916) 403-0522 or Anthony.Mader@wellpoint.com.

Sincerely,



Elizabeth P. Hall
Vice President for, Public Policy

Cc: Sandy Praeger, Chair, B Committee
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Appendix A

Example of a WellPoint Quality Program that Aligns with Federal Agency Pronouncements and Public Program Initiatives on Quality: Preventable Adverse Events (Hospital Acquired Conditions and Wrong Surgeries)

In 1999, the Institute of Medicine (IOM) concluded in its report, *To Err is Human: Building a Safer Health System*, that between 44,000 and 98,000 people die each year in the U.S. because of medical errors.³⁷ AHRQ's research into the frequency and causes of medical errors was used by the IOM panel.³⁸

In response to the IOM's findings, the federal Quality Interagency Coordination Task Force instructed the National Quality Forum, a not-for-profit public-private partnership that focuses on monitoring health care quality and promoting quality improvement, to "identify a basic set of patient safety measures."³⁹

In 2002, the NQF published "Serious Reportable Events in Healthcare," which identified 27 adverse events that are serious and largely preventable.⁴⁰ NQF expanded the list to 28 events and they became known as "never events" within the health care community and the public, though NQF formally refers to these as serious reportable events.

Section 5001(c) of the Deficit Reduction Act of 2005 required the Secretary of the U.S. Department of Health and Human Services to select, by October 1, 2007, at least two hospital-acquired medical conditions that:

- Are high cost or high volume or both;
- Are a Major Complication or Comorbidity (MCC) or a Complication/Comorbidity (CC) that would, in the absence of this provision, result in the assignment of the case to a MS-DRG that has a higher payment when present as a secondary diagnosis; and
- Could reasonably have been prevented through the application of evidence-based guidelines.

In August 2007, the Centers for Medicare and Medicaid Services, after receiving input from a number of groups and organizations, announced that Medicare will no longer pay for charges related to certain events, some of which are from the NQF list. This change became effective on October 1, 2008. The events that CMS identified include:

1. Object left in the body during surgery
2. Air embolism or blockage
3. Blood incompatibility
4. Catheter-associated urinary tract infection
5. Vascular catheter-associated infection
6. Pressure ulcers (stages 3 & 4)
7. Hospital-acquired injuries (falls and trauma): fractures, dislocations, intracranial injury, crushing injury, burn, and other unspecified effects of external causes
8. Surgical site infection following:
 - a. Coronary artery bypass graft – CABG (mediastinitis)
 - b. Certain orthopedic procedures
 - c. Bariatric surgery for obesity
9. Deep vein thrombosis (DVT) and pulmonary embolism (PE) following hip or knee replacement
10. Manifestations of poor glycemic control

37 Kohn LT, Corrigan JM, & Donaldson MS (Eds.). *To err is human: Building a safer health system*. Committee on Quality of Health Care in America, Institute of Medicine, National Academies Press, Washington, DC, 2000.

38 Eisenberg JM. *Response of the Quality Interagency Coordination (QulC) Task Force*. Testimony before a Joint Hearing of the Senate Health, Education, Labor, and Pensions Committee and the Senate Appropriations Subcommittee on Health, Education, and Labor, Washington, DC, February 22, 2000.

39 Ibid.

40 *Serious reportable events in healthcare: A consensus report*. National Quality Forum, Washington, DC, 2002, and *No pay for 'never event' errors becoming standard*,

Amednews.com, 01/07/2007.

In addition, in 2009 CMS stated it would not pay for any charges related to “wrong surgery”—wrong site, wrong procedure, or wrong patient—because these services are considered not medically appropriate and necessary and, therefore, are excluded from Medicare coverage.

In 2007, WellPoint started its own program to address preventable adverse events. This program was piloted in Virginia, where, as in the Medicare program, neither WellPoint nor our members would be required to pay claims for the preventable adverse events identified by CMS. Effective October 1, 2008, WellPoint expanded this program enterprise-wide and has incorporated the CMS initiative on “wrong surgery.” Subsequently all Blue Plans have also aligned their programs with the CMS program.

Appendix B

Examples of WellPoint Quality Programs Following Federal Legislative Quality Requirements WellPoint's Comparative Effectiveness research (paper attached) WellPoint's Safety Sentinel Program

WellPoint Healthcare Safety Sentinel System

The Healthcare Safety Sentinel System (HSSS) takes advantage of the wealth of information generated by WellPoint affiliated plans each day to address one of the health care system's most pressing concerns: the lack of knowledge on the safety of health care products and services. The HSSS is an "active" surveillance system, as opposed to the FDA's current Adverse Event Reporting System (AERS) system, which is "passive" in that it depends on volunteer reporting by the community. The HSSS is comprised of analytic processes, a host of relationships with our provider and academic communities and collaborations with our clients aimed at generating and communicating information on the relative safety of various pharmaceuticals, biotechnologies, medical devices and procedures more rapidly, effectively, and cost-efficiently than is possible in the current system.

Key Elements for Success

- Speed – with our strong information assets, we will have the ability to improve the speed of detecting signals of safety concerns. In addition, because of our local market depth, WellPoint affiliated health plans are uniquely positioned to rapidly validate or refute the signal by collaborating with our providers in the conduct of signal validation studies.
- Accuracy – because the information source for the HSSS is designed first and foremost to pay claims, much of the early development work on the HSSS has focused on the developing, testing and refining of various algorithms to be used in determine coding patterns that are most predictive of a true adverse event. This work, along with our methods development work with our colleagues at Harvard Medical School/Brigham and Women's Hospital's department of Pharmacoepidemiologic and Pharmacoeconomics, continues to improve the accuracy and reliability of our system. This work will be ongoing for the foreseeable future.
- Acuity and Actionability – while understanding the relative safety of a health care intervention is important, the most valuable contribution of the HSSS is ultimately to better inform decision-makers as to which populations and under what circumstances the risk is greater than the benefit. Risk/benefit considerations are the heart and soul of medical decision-making and providing this information in a personalized fashion to physicians, regulators, policy-makers or members at the point of the decision provides the opportunity for optimal outcomes. Our advantages in this area include:
 - Size of population and database
 - Broad population distribution
 - Local market depth (allowing for better subpopulation assessments)
 - Collaborations with our provider community (HealthCore's Integrated Research Network)
 - Collaborations with Harvard Medical School, University of Pennsylvania and University of North Carolina

- Physician and patient messaging capabilities (RHI) and ability to capitalize on the evolution of health information technology (HIT) and other decision-support mechanisms. The more connected the medical community, the more valuable the HSSS becomes.

While it is true that the HSSS will provide a significant benefit to the country as a whole, since the response to various health care interventions in highly population specific, impacted by age, gender, race, ethnicity, accompanying illnesses and concomitant medications, it is important for WellPoint affiliated health plans to be able to better understand how our membership responds both positively (clinical improvement) and negatively (serious adverse events). This information helps to enable us to create more customized, personalized and effective (value and safety) programs, benefit structures and medical policy.

What are our competitors doing in safety?

Given the elements of success detailed above, few organizations are capable of operating as a standalone system. Currently, in addition to WellPoint, there are two large health plans actively involved in safety research (United Healthcare through Ingenix's I3Drug Safety group and Kaiser, by itself and in collaboration with a consortium of smaller HMOs through the HMO Research Network). Aetna is beginning work in this area. Others have participated on a smaller scale contributing their data to academic and other research organizations for the conduct of safety analyses.

Critical Differentiator

Our collaborative research community (or Integrated Research Network (IRN), which is in development), as well as more than 1,000 network providers who have signed on to this effort, are the assets that will differentiate us. Our collaboration with our provider community, made possible due to WellPoint's deep local market presence and broad geographic coverage across the U.S., will allow for more elegant investigations and rapid validation of signals found in by the HSSS.

Timelines/Milestones

- Investment approved by the executive leadership team in June 2007
- Development initiated January 2008
- Development work consisting of:
 - Outlining, detailing and testing of the investigative processes
 - Enhancement of surveillance methods
 - Development of adverse event algorithms and validation for top adverse events (seven completed to date including heart attack and stroke)
 - Development of the communications plan for signal evaluation
 - Legal review
- Release 1 launched in September 2009
- Our first utilization of the HSSS is for the monitoring of the safety of the H1N1 Vaccine, a project entitled PRISM that is in collaboration with AHIP and HHS/CDC.

Release 1 of the HSSS

- Purposely non-automated as we continue to develop and refine the processes.
- Evaluation of specific drugs where a suspicion of an adverse event already exists.

Future Releases of the HSSS

- As each process is validated it will be automated to improve the speed of the analysis and reduce the staff requirements for each investigation.
- As the processes and methods mature, we will move to a surveillance process that will look for adverse events even where suspicions do not yet exist (in essence an early warning system).

Clients

- Federal
 - Food and Drug Administration
 - Center for Disease Control
- Industry
 - Pharmaceutical companies
 - Biotechnology companies
 - Medical device manufacturers
- WellPoint and other participating Blue plans (currently limited to the WellPoint health plans)

Value to WellPoint

- Innovation and market differentiation
- New source of revenue from both public (FDA/CDC) and private (industry – multi-billion dollar post-marketing research industry)
- Potential for improvement in cost of care by avoidance of adverse events
- Ideal opportunity to create a strong, positive collaborative relationship with our providers (especially network physicians)
- Public Relations – create strong perceived value contribution to health care system overall

Relationship to the FDA’s Sentinel Initiative (SI)

The FDA Amendment Act of 2007 mandated the development of a national active surveillance system by the FDA with key milestones of having 10 million lives by 2010 and 100 million by 2012. Because of its size, WellPoint will be able to field a standalone system. We have, however, committed to collaboration with the FDA in the construct of the SI and have been working with thought leaders around the country since 2007 in evaluating options for building the SI. The SI will be needed in the evaluation of rare events where very large numbers are needed to determine the presence or absence of elevated risk.

Along with a handful of other organizations (Harvard Medical School, eHealth Initiative and Ingenix’s I3Drug Safety), WellPoint also collaborated with Mark McClellan at the Brookings Institution to develop a white paper on the key components and core principles necessary for the success of the SI. A summary of this document was published in the New England Journal of Medicine. (“The New Sentinel Network – Improving the Evidence of Medical Product Safety.” *N Engl J Med*, August 13, 2009 36;7).

The FDA issued an RFP in the summer of 2009 looking for proposals from collaborating organizations to build the initial framework for what they believe will eventually be the FDA Sentinel System. There were a number of applicants for the contract. Our collaboration, led by Richard Platt from Harvard Medical School/Harvard Pilgrim won the bid. WellPoint/HealthCore is the largest data environment

represented under the contract and HealthCore is heavily involved in the leadership of the collaborative. Other health plans involved include Kaiser, Cigna, Humana and several of the smaller integrated systems including Henry Ford, Lovelace Clinical and Group Health. AHIP is also a collaborator along with a large number of academic institutions across the country.

Key market factors driving the demand for post-marketing safety services and capabilities

- Institute of Medicine (IOM) reports on health care system safety and quality deficiencies
- FDA Amendment Act of 2007
- Increased pressure from regulators and payers for stronger evidence on product safety and effectiveness (value)
- Increased outsourcing of research services by industry
- American Recovery and Reinvestment Act (ARRA) of 2009 which provided economic stimulus to comparative effectiveness (safety and effectiveness research are supported by the same infrastructure backbone)
- Evolution of HIT and economic support for its implementation
- Evolution of electronic data sources and analytic methods

Impact of Asthma Controller Medications on Clinical, Economic, and Patient-Reported Outcomes

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OBJECTIVE: To comprehensively evaluate clinical, economic, and patient-reported outcomes associated with various therapeutic classes of asthma controller medications.

PATIENTS AND METHODS: This observational study, which used administrative claims data from US commercial health plans, included patients with asthma aged 18 through 64 years who filled a prescription for at least 1 asthma controller medication from September 1, 2003, through August 31, 2005. Outcome metrics included the use of short-acting β -agonists (SABAs), the use of oral corticosteroids, inpatient (INP)/emergency department (ED) visits, and asthma-related health care costs. A subset of 5000 patients was randomly selected for a survey using the Mini-Asthma Quality of Life Questionnaire, the Work Productivity and Activity Impairment questionnaire, and the Asthma Therapy Assessment Questionnaire.

RESULTS: Of 56,168 eligible patients, 823 returned completed questionnaires. Compared with inhaled corticosteroids (ICSs), leukotriene modifiers (LMs) were associated with lower odds of INP/ED visits (odds ratio [OR], 0.80; $P < .001$), lower odds of using 6 or more SABA canisters (OR, 0.81; $P < .001$), and higher annual cost (\$193; $P < .001$). In the subgroup analysis of adherent patients, LMs were associated with higher odds of INP/ED visits (OR, 1.74; $P = .04$), lower odds of using 6 or more SABA canisters (OR, 0.46; $P < .001$), and higher annual cost (\$235; $P < .001$). Inhaled corticosteroids and LMs had a comparable impact on all patient-reported outcomes. For combination therapy, ICS plus a long-acting β -agonist consistently showed at least equivalent or better outcomes in the use of SABAs and oral corticosteroids, the risk of INP/ED visits, cost, asthma control level, quality of life, and impairment in productivity and activity.

CONCLUSION: Inhaled corticosteroids were associated with a lower risk of INP/ED visits, and a lower cost if adherence was achieved. When adherence cannot be achieved, LMs may be a reasonable alternative. Combination therapy with ICS plus a long-acting β -agonist was associated with better or equivalent clinical, economic, and patient-reported outcomes.

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ATAQ = Asthma Therapy Assessment Questionnaire; BMI = body mass index; COPD = chronic obstructive pulmonary disease; ED = emergency department; HIPAA = Health Insurance Portability and Accountability Act; ICD-9-CM = International Classification of Diseases, Ninth Revision, Clinical Modification; ICS = inhaled corticosteroid; INP = inpatient; LABA = long-acting β -agonist; LM = leukotriene modifier; Mini-AQLQ = Mini-Asthma Quality of Life Questionnaire; MPR = medication possession ratio; NAEP = National Asthma Education and Prevention Program; OCS = oral corticosteroid; SABA = short-acting β -agonist; WPAI = Work Productivity and Activity Impairment

Asthma is a common and chronic inflammatory disorder of the airways that affects more than 22 million Americans.¹ It is associated with considerable morbidity: in 2004 it resulted in 14.7 million outpatient visits, 1.8 million emergency department (ED) visits, and nearly 500,000 hospitalizations.¹ Asthma also carries a substantial economic burden, with an estimated total cost of \$18.3 billion annually, including \$10.1 billion in direct costs for medications and health care services and \$8.2 billion in indirect costs associated with lost productivity because of missed days of school or work.²

In addition to its clinical morbidity and economic burden, asthma is associated with adverse patient-centered outcomes, such as decreased quality of life and lost days

For editorial comment, see page 673

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at work or school.^{3,4} These outcomes are important because they reflect the patients' burden of disease rather than a simple assessment of clinical and economic perspectives. Although some clinical trials have assessed patient-centered outcomes,⁵⁻⁷ few such studies have been performed in real-world settings.

The current asthma management guidelines from the National Asthma Education and Prevention Program (NAEPP) Expert Panel of the National Institutes of Health (National Heart, Lung, and Blood Institute) recommend a stepwise approach to asthma management.⁴ However, the appropriate pharmacotherapy for asthma in real-world settings remains a subject of debate. Several studies have evaluated how effectively asthma controller medications improve clinical (eg, symptom control and exacerbation) and economic (eg, cost of care) outcomes, but the results have been inconsistent. For instance, the findings of some studies suggest that the best outcome is achieved with the use of inhaled corticosteroids (ICSs) as monotherapy,⁸⁻¹⁰ whereas other studies report discrepant findings.^{11,12} Several studies have found that superior outcomes are achieved by the combination of ICSs plus long-acting β -agonists (LABAs)¹³⁻¹⁵; however, others have suggested that coupling ICSs with a leukotriene modifier (LM) would be a reasonable choice.¹⁶ Few of these studies have attempted to establish the association between controller medications and patient-centered outcomes. In one study, O'Connor et al¹⁷ found that the effectiveness of fluticasone propionate/salmeterol (100/50 μ g) on patient-reported outcomes was similar to that of montelukast (10 mg); however, these investigators did not study ICSs alone or other combination therapies.

The current study was designed to address the existing gap in knowledge about the effectiveness of various therapeutic classes of asthma controller medications for adult asthma patients by integrating one of the largest administrative claims databases in the United States with the results of a comprehensive survey. To our knowledge, this is the first study to comprehensively determine the association between therapeutic classes of asthma controller medications and patient-reported asthma control problems, quality of life, work productivity, and activity impairment, as well as both clinical and economic end points.

PATIENTS AND METHODS

DATA SOURCE

This observational study used administrative claims data obtained from 8 geographically dispersed US commercial health plans that represent approximately 17.5 million members. The administrative data set consisted of integrated medical claims, pharmacy claims, and eligibility files. The study database was developed in compliance

with the regulations of the Health Insurance Portability and Accountability Act (HIPAA) of 1996.

RETROSPECTIVE COHORT

Patient Selection. To be eligible for the study, patients had to be aged 18 through 64 years with at least 1 medical claim with an *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)* code for asthma (*ICD-9-CM: 493.xx*) from September 1, 2002, through August 31, 2006, and at least 1 prescription claim for an asthma controller medication from September 1, 2003, through August 31, 2005 (intake period). Eligible patients had to have received either monotherapy with an ICS, a LABA, or an LM or combination therapy with an ICS and a LABA; an ICS and an LM; or an ICS, a LABA, and an LM. The class of the first controller medication for which a prescription was filled during the intake period was considered to be the index class of controller medications for each patient, and the prescription date was considered to be the index date. To account for instances of combination therapy in which prescriptions for 2 medications might be filled on different days, we used the following algorithm: the patient was considered to be taking combination therapy if a prescription for controller 2 (a different class of medication from that of the index controller) was filled and the prescription for the index controller was refilled after the fill date for controller 2 but within 90 days after the index date for controller 1.

Once an index class of controller medications and an index date had been determined, the patient remained in that index class for the rest of the study period, regardless of any switching or discontinuation of medications. Patients were required to be continuously enrolled in a health plan for at least 12 months before and after the index date. Patients were excluded from the study if they had a medical claim for chronic bronchitis or emphysema (*ICD-9-CM: 491.xx-492.xx*), cystic fibrosis (*ICD-9-CM: 277.0x*), bronchopulmonary dysplasia (*ICD-9-CM: 770.7x*), or other respiratory diseases (*ICD-9-CM: 495.xx-519.xx*) at any time during the study period.

Study Measures. Four outcomes were assessed: use of short-acting β -agonists (SABAs), use of oral corticosteroids (OCSs), inpatient (INP)/ED visits, and total cost of care attributable to asthma during the 12-month period after the index date. To account for the potential of regular prophylactic use of SABAs before exercise, we measured SABA use with a binary variable (receiving vs not receiving ≥ 6 canisters); this variable served as an indicator of lack of asthma control. Oral corticosteroid use was measured by the number of prescriptions filled for oral prednisone or methylprednisolone; this variable served as an indicator of asthma exacerbation. An INP/ED visit was defined as at least 1 asthma-related hospitalization or ED visit vs no such visits

(binary), determined by institutional claims that contained an *ICD-9-CM* code for asthma. Total cost of care reflected the total allowable amount reimbursed by the health plans during the 12-month period after the index date.

Important potential confounding variables, including disease severity and adherence to controller medications, were also captured and were controlled for in analyses of the association between index controller medication and outcomes. Asthma disease severity was approximated by using 3 available claims-based severity scales, which classified patients into severity groups according to the use of asthma controllers, SABAs, and OCSs; the number of hospitalizations; and the number of ED visits during the 12-month period before the index date.¹⁸⁻²⁰ The scale determined to best discriminate the groups was included in the multivariate analyses, whereas the other 2 scales were used in the sensitivity analyses to examine the consistency of the results. Adherence to controller medications was measured by using the medication possession ratio (MPR), defined as the ratio of the total-day supply of index controller medications dispensed during the period to the total number of days during the 12-month period after the index date. Patients with an MPR of 0.8 or higher were considered to be adherent to therapy.

SURVEY COHORT

Patient Selection. A subset of patients from the retrospective cohort was selected for the survey. Eligible patients had to be actively enrolled in a health plan on August 31, 2006 (latest data available at the time of conducting the survey), and had to have filled prescriptions for at least 2 asthma controller medications in 2006. Patients were randomly selected for the survey and were grouped according to the index controller medications determined by the retrospective cohort study. A HIPAA waiver of authorization for patient consent was obtained from a central institutional review board (Quorum Review); this waiver allowed the use of protected health information to contact patients for participation. A total of 5000 questionnaires were mailed in May and June of 2007 and were collected in compliance with HIPAA guidelines. A letter from the medical director of the regional health plan accompanied the questionnaires, and a small financial incentive was provided to encourage participation. Written consent was obtained from all respondents.

Survey Instruments. The survey was designed to collect information about age, sex, race/ethnicity, education level, income level, body mass index (BMI), smoking status, chronic obstructive pulmonary disease (COPD) status, and controller medication used at the time of survey. The validated tools included the 15-question Mini-Asthma Quality of Life Questionnaire (Mini-AQLQ), with scores

ranging from 1 to 7 and higher scores indicating better quality of life²¹; the 4-question Asthma Therapy Assessment Questionnaire (ATAQ), with scores ranging from 0 to 4 and higher scores indicating more control problems²²; and the 9-question Work Productivity and Activity Impairment (WPAI) questionnaire, with scores ranging from 0% to 100% and higher scores indicating greater impairment.²³⁻²⁵

Proxies of asthma disease severity scales and adherence to controller medication regimens at the time of the survey were generated by using administrative claims data from the 12 months before the survey or the end of health plan eligibility, whichever came first. As was true for analyses of data from the retrospective cohort, both measures were controlled for in the multivariate analyses so that the independent association of controller medication with patient-reported outcomes could be determined.

STATISTICAL ANALYSES

All outcome measures were compared across the therapeutic classes of controller medications within the monotherapy and combination therapy cohorts. The statistical significance of differences between cohorts was assessed by using the Wilcoxon rank-sum test or the Kruskal-Wallis test for continuous variables and the Pearson χ^2 test for categorical variables. In post hoc tests, Bonferroni α adjustment was used to account for multiple comparisons. An a priori 2-tailed level of significance (α value) of .05 was set for all analyses.

Multivariate analyses were performed to examine the association between index controller medication and each outcome while controlling for potential confounders. Generalized linear models were constructed with various response probability distributions and link functions, depending on the distribution of the outcomes and the goodness of fit of the models. For instance, γ distribution and log link function were used for total cost of care, whereas binomial distribution and logit link function were used for binary outcomes (eg, whether at least 6 SABA canisters were used and whether INP/ED visits occurred). Covariates were chosen a priori for all models on the basis of clinical relevance and baseline differences, which included age, sex, region, plan type (ie, health maintenance organization, preferred provider organization), season and year of index date, treatment naivety, baseline comorbid conditions (ie, allergic rhinitis, sinusitis), proxy of asthma severity, baseline medication used (ie, SABA, OCS), and other demographic information collected from the survey cohort (ie, race/ethnicity, education, income level, BMI, smoking status).

Because of a substantial difference in the level of adherence across index controller medication groups in the retrospective cohort analysis, we also conducted a subgroup analysis of data from adherent patients with an MPR of at

TABLE 1. Patient Characteristics for Retrospective Cohort (N=56,168)^a

	ICS only	LABA only	LM only	ICS + LABA	ICS + LM	ICS + LABA + LM
No. (%) of patients	11,561 (21)	1855 (3)	13,725 (24)	23,549 (42)	1065 (2)	4413 (8)
Age (y), mean ± SD	43±12	44±12	42±12	43±12	44±12	43±12
Female (%)	64.0	62.1	68.0	61.9	62.2	65.5
Health plan region (%)						
West	50.6	50.2	37.3	51.7	44.0	49.6
Central	33.0	33.2	44.6	25.6	42.6	33.7
Southeast	16.4	16.6	18.0	22.6	13.3	16.7
Health plan type (%)						
Health maintenance organization	21.2	17.8	16.8	20.5	18.7	20.0
Preferred provider organization	68.8	71.9	74.3	68.4	71.1	69.2
Point of service	5.3	5.4	4.0	5.5	4.8	4.9
Other	4.7	4.9	4.9	5.6	5.4	5.9
Comorbid condition at baseline (%) ^b						
Allergic rhinitis	24.7	22.5	40.1	28.5	31.9	34.7
Sinusitis	16.8	16.6	26.4	20.4	19.4	22.3
Baseline asthma severity (%) ^c						
High-risk	6.5	5.9	5.5	6.3	7.0	8.2
Medium-risk	17.1	14.6	20.3	20.0	21.8	26.1
Low-risk	76.4	79.6	74.2	73.8	71.2	65.7
Season of index date (%)						
Spring	20.6	14.5	19.6	19.2	13.4	12.8
Summer	12.0	9.3	12.8	12.5	6.8	8.6
Fall	40.5	53.5	51.9	44.9	63.5	66.2
Winter	26.9	22.7	15.7	23.4	16.3	12.4
Year of index date (%)						
2003	41.0	55.6	48.9	43.5	63.8	64.4
2004	40.6	34.8	32.7	33.4	23.7	20.7
2005	18.4	9.6	18.4	23.0	12.6	14.9
Newly treated (%) ^d	35.7	34.1	31.8	32.1	22.6	18.2
Days of therapy, mean ± SD ^e	79±77	109±103	182±135	132±118	179±103	210±116
Adherent to therapy (%) ^f	3.4	9.2	30.2	12.5	15.3	27.2

^a ICS = inhaled corticosteroid; LABA = long-acting β-agonist; LM = leukotriene modifier.

^b Based on the 12-month period before the index date.

^c Proxy of asthma severity (as described in Schatz et al²⁰).

^d Defined as no asthma treatment during the 12-month period before the index date.

^e Treatment with index controller medications received during the 12-month period after the index date.

^f Defined as a medication possession ratio of 0.8 or higher during the 12-month period after the index date.

least 0.8 during the 12-month period after the index date. All outcomes were analyzed by using multivariate analyses parallel to those used in the primary analysis above.

RESULTS

RETROSPECTIVE COHORT

A total of 56,168 patients were eligible for the study. Of these, 11,561 (21%) used an ICS, 1855 (3%) used a LABA, and 13,725 (24%) used an LM as monotherapy, whereas 23,549 (42%) used ICS + LABA as combination therapy; 1065 (2%), ICS + LM; and 4413 (8%), ICS + LABA + LM (Table 1). Overall, the mean age of the patients was 43 years; approximately two-thirds of the cohort was female. At baseline, allergic rhinitis and sinusitis were most prevalent in the LM monotherapy group (rhinitis, 40.1%; sinusitis, 26.4%; Table 1). Most patients (65.7%-79.6%) in all controller medication groups had a low risk of asthma severity. During the 12-month period after initiation of

the index controller medication, patients receiving LM monotherapy (>95% were taking montelukast) were more adherent to their index controller medication regimen than patients taking other monotherapies. On average, the LM monotherapy group received 182 days of therapy, whereas the ICS monotherapy group received 79 days of therapy. Only 9014 patients (16%) were determined to be adherent, defined as having an MPR of at least 0.8 for each controller medication used. The proportion of adherent patients was highest in the LM monotherapy group.

When preindex characteristics were controlled for by using a multivariable logistic regression model, the LABA and LM monotherapy groups were less likely than the ICS monotherapy group to receive at least 6 SABA canisters (LABA group: odds ratio [OR], 0.82; *P*=.02; LM group: OR, 0.81; *P*<.001) during the 12-month period after the index date (Table 2). For patients taking combination therapy, the odds of receiving at least 6 SABA canisters

TABLE 2. **Adjusted ORs of Receiving ≥ 6 SABA Canisters and Having ≥ 1 Asthma-Related INP/ED Visit^a**

Index controller medication	≥ 6 SABA canisters, OR (95% CI) ^b		≥ 1 INP/ED visit, OR (95% CI) ^b	
	All (N=56,168)	Adherent (n=9014) ^c	All (N=56,168)	Adherent (n=9014) ^c
Monotherapy				
ICS	Reference	Reference	Reference	Reference
LABA	0.82 (0.70-0.97)	0.61 (0.38-0.95)	0.95 (0.79-1.14)	2.87 (1.37-6.01)
LM	0.81 (0.74-0.88)	0.46 (0.36-0.59)	0.80 (0.72-0.88)	1.74 (1.02-2.99)
Combination therapy				
ICS + LABA	Reference	Reference	Reference	Reference
ICS + LM	2.13 (1.81-2.50)	3.22 (2.27-4.57)	1.40 (1.13-1.73)	1.58 (0.91-2.74)
ICS + LABA + LM	1.43 (1.30-1.57)	1.16 (0.97-1.39)	1.19 (1.05-1.34)	1.04 (0.79-1.36)

^a Analyses were controlled for age, sex, health plan region, health plan type (eg, health maintenance organization, preferred provider organization), season and year of index date, newness to asthma treatment, proxy of asthma severity (as described in Schatz et al²⁰), comorbid conditions (allergic rhinitis, sinusitis), use of baseline medications (short-acting β -agonist, oral corticosteroid), and baseline utilization of health care. CI = confidence interval; ED = emergency department; ICS = inhaled corticosteroid; INP = inpatient; LABA = long-acting β -agonist; LM = leukotriene modifier; OR = odds ratio.

^b Estimated by logistic regression analysis.

^c Defined as a medication possession ratio ≥ 0.8 during the 12-month period after the index date.

were 113% higher for the ICS + LM group and 43% higher for the ICS + LABA + LM than for the ICS + LABA group. The observed trend was consistent in the subanalysis of adherent patients, except that the odds of receiving at least 6 SABA canisters were similar for the ICS + LABA + LM group and the ICS + LABA group.

In another multivariable logistic regression analysis, the odds of having at least 1 INP/ED visit during the 12-month period after the index date were 20% lower for the LM monotherapy group than for the ICS monotherapy group (Table 2). However, this lower risk did not hold true in the subanalysis of adherent patients: for these patients, the odds of such a visit were 74% higher for the LM monotherapy group than for the ICS monotherapy group. For patients receiving combination therapy, the likelihood of having at least 1 INP/ED visit was higher for the ICS + LM group (OR, 1.40; $P=.002$) and for the ICS + LABA + LM group (OR, 1.19, $P=.005$) than for the ICS + LABA group, but no significant difference was observed among adherent patients.

For the multivariate adjusted use of OCSs during the 12-month period after the index date, no significant difference was found among the monotherapy groups (Table 3). In contrast, differences were noted for the combination therapy groups: the use of OCSs was on average 33% higher for the ICS + LM group and 32% higher for the ICS + LABA + LM group than for the ICS + LABA group. The subanalysis of adherent patients showed a similar trend, except that no significant difference was observed between the ICS + LABA group and the ICS + LM groups.

After the analysis was adjusted for preindex characteristics, the total asthma-attributable cost of care during the

12 months after the index period was 10% higher ($P<.001$) for the LABA group and 19% higher ($P<.001$) for the LM monotherapy group than for the ICS monotherapy group (Table 3). The adjusted mean total asthma-attributable costs per patient-year were \$1016 for the ICS group, \$1117 for the LABA group, and \$1209 for the LM monotherapy group. For the combination therapy groups, the costs for the ICS + LM group were 38% higher ($P<.001$) and the costs for the ICS + LABA + LM group were 81% higher ($P<.001$) than those for the ICS + LABA group. The subanalysis of adherent patients showed that total asthma-attributable costs were lowest for the ICS group among the monotherapy groups and for the ICS + LABA group among the combination therapy groups.

SURVEY COHORT

Of the 5000 questionnaires mailed, 823 eligible responses were received (response rate, 16.5%). For each controller medication cohort, the survey patients (respondents) and the nonsurvey patients were comparable in terms of age and sex, with 2 exceptions: within the ICS + LABA combination group, survey respondents were on average 3 years older than nonsurvey patients ($P<.001$), and the LM monotherapy survey group included 7% more female patients than the nonsurvey group ($P=.03$).

Of the 823 respondents, 116 (14%) reported using an ICS only; 110 (13%), an LM only; 280 (34%), ICS + LABA; 93 (11%), ICS + LM; 153 (19%), ICS + LABA + LM; and 71 (9%), other therapies, including a LABA ($n=11$), theophylline ($n=1$), other combination therapy ($n=6$), and no medication at all ($n=53$) at the time of survey. Most patients were female, white, educated (Bachelor's

TABLE 3. **Adjusted Use of OCSs and 12-Month Asthma-Attributable Total Cost for Total Cohort and Adherent Group^a**

Index controller medication	Use of OCSs, rate ratio (95% CI) ^b		Adjusted 12-mo asthma-attributable cost in US dollars (95% CI) ^{c,d}	
	All (N=56,168)	Adherent (n=9014) ^e	All (N=56,168)	Adherent (n=9014) ^e
Monotherapy				
ICS	Reference	Reference	1016 (988-1044)	1337 (1251-1429)
LABA	0.96 (0.89-1.04)	1.10 (0.84-1.44)	1117 (1063-1174)	1752 (1589-1931)
LM	0.97 (0.94-1.01)	0.99 (0.84-1.16)	1209 (1178-1241)	1572 (1520-1626)
Combination therapy				
ICS + LABA	Reference	Reference	1226 (1198-1254)	1936 (1870-2003)
ICS + LM	1.33 (1.23-1.44)	1.00 (0.80-1.26)	1687 (1582-1798)	2428 (2199-2681)
ICS + LABA + LM	1.32 (1.26-1.37)	1.33 (1.22-1.44)	2221 (2145-2301)	2885 (2760-3014)

^a Analyses controlled for age, sex, health plan region, health plan type (eg, health maintenance organization, preferred provider organization), season and year of index date, newness to asthma treatment, proxy of asthma severity (as described in Schatz et al²⁰), comorbid conditions (allergic rhinitis, sinusitis), baseline medication use (short-acting β-agonist, OCS), and baseline utilization of health care. CI = confidence interval; ICS = inhaled corticosteroid; LABA = long-acting β-agonist; LM = leukotriene modifier; OCS = oral corticosteroid.

^b Estimated by Poisson regression.

^c Estimated by generalized linear model with log link function and γ distribution.

^d All controller medications were significantly different from each other at the level of *P*<.05 within the monotherapy group and within the combination therapy group.

^e Defined as a medication possession ratio ≥0.8 during the 12-month period after the index date.

or graduate degree) nonsmokers, with a medium level of annual income (\$50,000-\$99,999) (Table 4). Overall, the groups using the various classes of controller medications were comparable in age, race/ethnicity, education level, income level, smoking status, BMI, and COPD status. The proportion of female patients was lower in the ICS monotherapy group (58.6%) than in the LM monotherapy group (76.4%; *P*=.005); among the combination therapy groups, the proportion of female patients was lowest in the ICS + LABA group (58.9%; *P*=.003). Most patients had “mild” asthma as determined by the Leidy severity scale.¹⁹ According to this scale, patients taking ICS + LABA + LM had more severe asthma than patients taking ICS + LABA (*P*=.02). During the period before the survey, patients who initiated LM monotherapy received on average 244 days of therapy with controller medications, whereas those who initiated ICS monotherapy received 147 days of therapy (*P*<.001). No significant difference was observed in length of therapy among the combination therapies.

Most survey respondents reported no asthma control problem on the ATAQ (Table 5). They reported an average score of 5.48 on the Mini-AQLQ, 16.5 on WPAI-activity impairment, 9.2 on WPAI-work impairment, and 12.3 on WPAI-school impairment. No significant differences in these scores were observed across the monotherapy groups or across the combination therapy groups, except that, compared with the patients taking ICS + LABA + LM, the patients taking ICS + LABA reported higher scores

on the Mini-AQLQ (5.54 vs 5.09; *P*<.001), lower scores on WPAI-activity impairment (14.8 vs 24.1; *P*<.001), and lower scores on WPAI-work impairment (9.0 vs 15.0; *P*<.001).

When the analysis was controlled for age, sex, race/ethnicity, education level, income level, BMI, smoking status, COPD status, proxy of asthma severity (Leidy severity scale¹⁹), and adherence level, the outcomes of the ICS monotherapy group were comparable with those of the LM monotherapy group on ATAQ (13% fewer asthma control problems; *P*=.50), the Mini-AQLQ (0.01 better; *P*=.95), WPAI-activity impairment (18% less impairment; *P*=.27), and WPAI-work impairment (1% less impairment; *P*=.62). Patients receiving combination therapy with ICS + LABA reported better outcomes than those receiving ICS + LABA + LM therapy on the Mini-AQLQ (0.27 better; *P*=.01), WPAI-activity impairment (28% less impairment; *P*=.009), and WPAI-work impairment (4.6% less impairment; *P*=.01). Similarly, the ICS + LM group reported better outcomes than the ICS + LABA + LM group on the Mini-AQLQ (0.29 better; *P*=.03), WPAI-activity impairment (30% less impairment; *P*=.29), and WPAI-work impairment (6% less impairment; *P*=.01). No significant difference in outcomes was observed between the ICS + LABA group and the ICS + LM group. Multivariate adjustment was not performed for WPAI-school impairment because of the small sample size (only 14.5% of respondents were attending school).

TABLE 4. Demographic Characteristics of 823 Survey Respondents^a

	ICS only	LM only	ICS + LABA	ICS + LM	ICS + LABA + LM	Other ^b
No. (%) of patients	116 (14)	110 (13)	280 (34)	93 (11)	153 (19)	71 (9)
Age (y), mean ± SD	47±13	44±14	46±12	42±14	46±12	42±12
Female (%)	58.6 ^c	76.4 ^c	58.9 ^d	73.1 ^d	73.2 ^d	59.2
White (%)	87.9	92.7	87.1	92.5	91.5	74.7
Education level (%)						
High school or less	13.8	17.3	15.0	17.2	13.1	15.5
Some college/Associate's degree	26.7	39.1	38.6	33.3	36.6	40.9
Bachelor's/graduate degree	59.5	42.7	45.0	49.5	49.0	36.6
Refused	0.0	0.9	1.4	0.0	1.3	7.0
Annual income (%)						
≤\$49,999	24.1	23.6	22.5	23.7	25.5	26.8
\$50,000-\$99,999	41.4	42.7	37.5	37.6	41.8	33.8
≥\$100,000	23.3	24.6	28.6	26.9	20.9	18.3
Refused	11.2	9.1	11.4	11.8	11.8	21.1
Smoking status (%)						
Current smoker	2.6	2.7	6.4	3.2	5.2	4.2
Former smoker	25.0	17.3	24.3	19.4	25.5	16.9
Never smoked	72.4	80.0	68.6	77.4	69.3	71.8
Body mass index (%)						
Underweight	1.7	0.9	0.7	2.2	1.3	1.4
Normal	35.3	38.2	37.1	38.7	31.4	31.0
Overweight	31.0	33.6	31.4	25.8	23.5	31.0
Obese	31.9	27.3	30.7	33.3	43.1	28.2
Chronic obstructive pulmonary disease (%)	9.5	9.1	11.8	11.8	16.3	2.8
Asthma severity (%) ^{e,f}						
Severe/moderate persistent	19.0	19.1	17.5 ^d	24.7 ^d	26.8 ^d	23.9
Mild persistent	34.5	29.1	31.8 ^d	37.6 ^d	35.3 ^d	33.8
Mild intermittent	46.6	51.8	50.7 ^d	37.6 ^d	37.9 ^d	42.3
Duration of therapy (d), mean ± SD ^{f,g}	147±111 ^c	243±125 ^c	166±118	185±89	198±113	45±102

^a No comparisons of controller medications within the monotherapy group and the combination therapy group were statistically significant unless specified. ICS = inhaled corticosteroid; LABA = long-acting β -agonist; LM = leukotriene modifier.

^b Included LABA alone (n=11), theophylline (n=1), other combination therapy (n=6), and no medication use at the time of survey completion (n=53).

^c ICS only vs LM only; $P < .05$.

^d ICS + LABA vs ICS + LM vs ICS + LABA + LM; $P < .05$.

^e Proxy of asthma severity (as described in Leidy et al¹⁹) on the basis of administrative claims.

^f During the 12-month period before the survey date or at the ending date of health plan eligibility, whichever came first (health plan eligibility for 77 patients ended before the survey date; the difference in their distribution across controller medication groups was not statistically significant; $P = .66$).

^g Treatment with controller medication as self-reported in the survey.

DISCUSSION

To our knowledge, this is the first comparative effectiveness study to comprehensively evaluate clinical, economic, and patient-reported outcomes across various therapeutic classes of asthma controller medications. Among the monotherapy groups, the LM group appeared to have better clinical outcomes than the ICS group, as indicated by less SABA use and lower risk of INP/ED visits. This finding was in line with those of some previous studies^{12,26}; however, it conflicted with the 2002 and 2007 NAEPP guidelines, which recommended ICS as the preferred monotherapy.^{4,27} This conflict could be due to the observation that the patients in this study were less adherent to an inhaled controller medication (ICS, LABA) regimen than to an oral controller medication (LM) regimen. This observation concurred with the findings of other studies, which indicated that adherence

was poor for inhaled medications, both in general and in comparison with oral medications.²⁸⁻³⁰

As is true for other therapeutic areas (ie, hyperlipidemia, hypertension), medication adherence has been crucial to obtaining the beneficial effects of asthma treatment, and poor adherence to medication has been associated with detrimental health outcomes for patients with asthma.^{31,32} In this study, for patients who were adherent (MPR ≥ 0.8) to their controller medication regimen, the risk of INP/ED visits was lower for patients receiving ICS monotherapy than for those receiving LM. These results were consistent with the findings of clinical trials,³³ in which patients were closely monitored and were more likely to adhere to medication regimens. Inhaled corticosteroid monotherapy was associated with higher use of SABAs, a marker of asthma symptom control, for both total patients and adherent patients. Although this trend concurred with the

TABLE 5. Association Between Self-reported Controller Medication Use and Summary Scores on ATAQ, Mini-AQLQ, and the WPAI Questionnaire for 832 Survey Respondents^a

	ICS only	LM only	ICS + LABA	ICS + LM	ICS + LABA + LM	Other ^b
No. (%) of patients	116 (14)	110 (13)	280 (34)	93 (11)	153 (19)	71 (9)
ATAQ, No. (%) of control problems ^c						
0	66.4	57.3	59.3	54.8	47.1	66.2
1	20.7	22.7	23.2	25.8	28.1	11.3
≥2	12.9	20.0	17.5	19.4	24.8	22.5
Mini-AQLQ summary score, mean ± SD ^d	5.63±0.96	5.52±1.03	5.54±1.08 ^e	5.46±1.07	5.09±1.16 ^e	5.81±1.10
WPAI score, mean ± SD ^f						
Activity impairment	12.5±17.4	16.2±19.9	14.8±19.3 ^e	17.0±18.7	24.1±23.9 ^e	13.0±20.2
Overall work impairment ^g	5.7±9.5	7.2±16.0	9.0±16.8 ^e	9.0±13.8	15.0±19.9 ^e	6.1±14.3
Overall school impairment ^h	13.9±27.3	5.5±8.9	13.6±21.2	10.9±17.9	16.3±15.9	14.2±22.9

^a None of the comparisons between controller medications within the monotherapy group and the combination therapy group were statistically significant unless specified. ATAQ = Asthma Therapy Assessment Questionnaire; ICS = inhaled corticosteroid; LABA = long-acting β-agonist; LM = leukotriene modifier; Mini-AQLQ = Mini-Asthma Quality of Life Questionnaire; WPAI = Work Productivity and Activity Impairment.

^b Included LABA alone (n=11), theophylline (n=1), other combination therapy (n=6), and no medication use at the time of survey completion (n=53).

^c Higher values indicate more control problems.

^d Higher values indicate better quality of life.

^e ICS + LABA vs ICS + LABA + LM; *P*<.001; Bonferroni α=.0167.

^f Higher values indicate more impairment.

^g Overall, 82.0% were employed; differences in distribution across controller medication groups were not statistically significant; *P*=.21.

^h Overall, 14.5% were attending school; differences in distribution across controller medication groups were not statistically significant; *P*=.21.

findings of some other studies,^{12,34} the real reasons for this trend remain unknown and require further study. The importance of this finding is reduced by the fact that this study found no differences in patient-reported measures of asthma control between the ICS monotherapy group and the LM monotherapy group.

The appropriate use of an inhaled medication remains one of the challenges in the management of asthma. Because ICS monotherapy has been proved to be efficacious in randomized clinical trials and was associated in the current study with optimal clinical (except for higher SABA use) and economic outcomes for adherent patients, care management interventions should focus on achieving better adherence to ICS regimens so that the full benefit of this controller medication can be obtained. Only 3% of patients in the ICS monotherapy group were considered adherent, a finding that underlines the urgent need for a better understanding of the barriers to patient acceptance of the most proven and effective therapy. Providing patients with better education about correct inhaler technique and reviewing correct technique at planned visits could be helpful in maximizing the benefits of inhaled medications. When ICS adherence cannot be achieved, our findings indicate that an LM may be a reasonable alternative, although at a higher cost. This suggestion is supported by the finding that the effects of ICS monotherapy and LM monotherapy on patient-reported asthma control problems, quality of life, and work productivity and activity impairment were comparable. For patients who have

experienced difficulty in manipulating an inhaler, an oral tablet may be an easier option. In fact, this finding does not contradict the recommendations of the 2002 or 2007 NAEPP guidelines, which were meant to assist, not replace, the clinical decision making that is necessary for meeting individual patient needs and which consider LMs to be an alternative therapy when ICS monotherapy fails.^{4,27}

For combination therapy, patients receiving ICS + LABA consistently showed the lowest use of SABAs, the lowest or a comparable use of OCSs, the lowest or a comparable risk of INP/ED visits, and the lowest asthma-attributable total cost of care. When ICS + LABA and ICS + LM were compared, the findings were consistent with those of other observational studies^{14,15} and those of a Cochrane systematic review published in 2006, which showed that adding a LABA was superior to adding an LM in preventing exacerbations that required systemic OCSs, both improving lung function and asthma symptoms and reducing the use of rescue SABAs by adults.³⁵ In terms of patient-reported asthma control problems, quality of life, work productivity, and activity impairment, both ICS + LABA and ICS + LM were comparable in all aspects. When all clinical, economic, and patient-reported outcomes are considered, our results suggest that ICS + LABA should be the first choice when patients are switched from monotherapy to combination therapy. This finding is consistent with the recommendations of the 2002 and 2007 NAEPP guidelines, which state that ICS + LABA is the preferred combination therapy in a stepwise treatment approach.^{4,27}

Although ICS + LABA + LM was not one of the preferred therapies listed in the 2002 and 2007 NAEPP guidelines, this combination therapy was commonly used by our study patients. As expected, the patients using this combination exhibited the highest level of disease severity, as measured by the 3 proxies of asthma severity. Combination therapy with ICS + LABA + LM was associated with inferior clinical outcomes, the highest asthma-related total cost of care, a poorer quality of life, and more severe impairment in work productivity and activity. Although we controlled the multivariate analyses for asthma severity by using proxies, residual confounding by severity may have contributed to these findings.

To assess the effect of the study methodology on the results, we performed several sensitivity analyses using different methods. These methods included analyzing the number of SABA canisters used as a continuous variable rather than as a binary variable; using a more restrictive definition of OCSs (pharmacy claims for OCS 1 day before to 3 days after an office visit that had an ICD-9-CM code for asthma) because OCSs can be used for many other conditions; using 3 different proxies of asthma severity (as described in Schatz et al,²⁰ Leidy et al,¹⁹ and Cai et al¹⁸) in multivariate analyses; limiting the study sample to newly treated adults; analyzing ATAQ results as a continuous and as a categorical variable by using different cutoff points; and excluding patients with self-reported COPD from the analysis of the survey data. The results of all of these sensitivity analyses were consistent with the trends observed in the primary results and did not alter the overall conclusions of the study.

This study had several limitations. First, patients were not randomly assigned to treatment (controller medications) because of the nature of this observational study. Second, misclassification or measurement error could occur in administrative claims; however, it is unlikely that such errors would be systematically different across cohorts. Third, estimates of asthma severity were based on 3 claims-based proxies reported in the medical literature; these proxies may not accurately reflect disease severity as defined by the NAEPP guidelines. Fourth, although survey respondents were similar to the entire retrospective cohort in age and sex, they may not be representative of the entire retrospective cohort because of the low response rate. Although we cannot assume that our findings can be generalized to other populations, the geographical diversity and large size of the study sample increase the chances that the current results can be generalized to other insured adult populations.

CONCLUSION

To our knowledge, this study is the first to comprehensively evaluate the comparative effectiveness of various thera-

peutic classes of asthma controller medications on clinical, economic, and patient-reported outcomes in a real-world setting. This study factors in the perspective of the patient as well as the body of evidence of clinical and economic outcomes in its assessment of the results of asthma management. Our findings suggest that care management interventions should focus on improving adherence to ICS therapy so that optimal clinical and economic outcomes can be achieved. When adherence to ICS therapy cannot be achieved, an LM may be a reasonable choice for monotherapy. The combination therapy of ICS + LABA was associated with better or at least equivalent outcomes in all clinical, economic, and patient-reported perspectives. Therefore, ICS + LABA should be considered the first choice when patients are switched from monotherapy to combination therapy, as recommended by the 2002 and 2007 NAEPP guidelines.

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Appendix C
Examples of WellPoint Quality Programs that Comport With
Federal Agency Pronouncements on Quality

Imaging Patient Safety Program

Patient Safety Program Overview

As a part of its objective of increasing value to our clients and their members and providers, American Imaging Management (“AIM”), a WellPoint subsidiary, has taken a leadership position to promote patient safety in imaging. Since 2007, AIM has developed and implemented a Patient Safety Program (www.americanimaging.net/safety) that promotes more informed decision-making by physicians and patients by offering relevant information regarding the radiation exposure associated with diagnostic imaging procedures.

This program is based on two key components: (1) providing educational resources to consumers and programs; and (2) measuring, monitoring and reporting radiation exposure information. An overview of these components can be found below:

Providing Education and Outreach

In order to promote more informed decision-making by consumers and providers AIM launched its Patient Safety website “in February 2008. This website offers the following services:

- Ask AIMee:
An easy-to-use interface that provides members and physicians with information on the uses and radiation exposure associated with commonly ordered diagnostic imaging studies. Since the site’s launch in February 2008, Ask AIMee has attracted close to 20,000 visitors; as importantly over 80% of the visitors to the site have rated the site as being helpful or very helpful.

- Podcasts:
As a complement to Ask AIMEE, we launched a series of podcasts in 2009. Narrated by Dr. David Soffa, MD, MPA, FACR, AIM’s Senior Vice President, Medical Affairs and Dr. Thomas Power, MD, FACC, MRCPI, AIM’s Medical Director, Cardiology, the podcasts cover current issues in diagnostic imaging. AIM has already released six podcasts and we are planning additional ones for 2010.

- Links to Other Sources
The website provides links to other radiology resources such as the American College of Radiology.

Measuring, Monitoring and Reporting Radiation Exposure

Based on a number of verified sources, AIM has assigned radiation exposure values (as measured in millisieverts) to diagnostic imaging procedures that are covered under AIM’s programs. These values have been integrated in AIM’s preauthorization system.

When a service is approved for a health plan member, AIM’s system assigns the appropriate radiation exposure value for that service and records it. As subsequent services are approved for that member, AIM’s system aggregates the radiation exposure for each service. AIM’s radiation safety program uses this information for provider messaging and education once certain thresholds have been reached. These messages include the following:

- When the total aggregated radiation exposure for a member meets or exceeds 50 millisieverts, but is less than 100 millisieverts, physicians requesting radiation emitting diagnostic imaging procedures for that member receive a message. This message provides the member's aggregate radiation exposure level and requests that the provider take this information into account when determining the use of further imaging studies for the member.
- When the total aggregated radiation exposure for a member exceeds 100 millisieverts, all requests for radiation emitting diagnostic imaging procedures are immediately transferred for a peer-to-peer discussion between the ordering physician and an AIM Physician Reviewer. The purpose of this discussion is to provide an educational opportunity for the ordering physician regarding the potential effects from radiation exposure.

It is important to note that AIM's program does provide exceptions for those patients and providers that may utilize significant imaging above and beyond these radiation exposure levels.

In addition to provider messaging, AIM also provides health plans with reports concerning members that have been exposed to high levels of radiation from diagnostic imaging as well as information regarding providers ordering studies for these members. These reports allow health plans to identify member and provider educational opportunities.