



PBGH
Pacific Business
Group on Health

Evaluation of Consumer Decision Support Tools: *Helping People Make Health Care Decisions*

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About the Pacific Business Group on Health

The Pacific Business Group on Health (PBGH) is one of the nation's top business coalitions focused on health care. Our large purchaser members spend billions of dollars annually to provide health care coverage to more than 3 million employees, retirees and dependents. PBGH is a respected voice in the state and national dialogue on how to improve the quality and effectiveness of health care while moderating costs. Partnering with the state's leading health plans, provider organizations, consumer groups and other stakeholders, PBGH works on many fronts to promote value-based purchasing in health care. Reflecting the vision of its member organizations, PBGH plays a leadership role in an array of health care quality initiatives that includes providing consumers with standardized comparative quality information and developing methods to assess and communicate the quality of care delivered by health plans, medical groups, physicians and hospitals. For additional information or an electronic copy of this report, visit www.pbgh.org.

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Executive Summary

Consumer engagement in decisions about coverage, provider and treatment choices, and purchasing is central to the value-purchasing and benefit design strategies of large employers. The Pacific Business Group on Health has sought to advance breakthroughs in use of consumer tools, resources and performance information. The goal is to influence employees' value-based decision making and participation in managing their personal health. To date, leading purchasers have set expectations for their plan partners to expand decision support programs, while making direct investments in plan choice tools and health education.

This report presents evaluation frameworks for three (3) types of consumer decision support tools. The report highlights the strengths and weaknesses of leading online consumer decision support tools to inform the development and enhancement of additional Web-based services. As performance information becomes increasingly available, it is important to apply proven decision support techniques to produce consumer tools that work.

This project focuses on Web-based consumer tools sponsored by health plans, employers, or other third parties in three (3) specific decision areas:

- Treatment option support;
- Hospital choice; and
- Personal cost decision support.

The evaluation framework was created based on input from leading researchers, consultants and experts. The methodology and evaluation process are detailed in each section of this report.

Product performance varied widely across the tools evaluated in each of these three areas; few tools met standards across all of the key dimensions. Higher performing products were distinguished by: 1) the superior organization of data that fostered a clearer understanding of the information and 2) personalization of the tool to increase the relevance

of the information for the user. The latter area in particular calls for improvement.

Weaker products generally: 1) lacked personalized information such as health plan coverage and provider network data, and 2) did not address individual preferences and values. These two shortcomings are significant barriers for consumers. Decision support tools are irrelevant to patients unless the information they provide is germane to patients' particular treatment context, coverage situation, and personal preferences or values.

Treatment Decision Support

In an era of increasingly complex medical science, ever-evolving therapeutic options, and expanded consumer participation in health care decisions, making the "best" treatment choice can be a formidable challenge for patients and their physicians. When choosing among treatment options, patients consider a multitude of factors including efficacy, time to recovery, qualifications of providers, plan coverage, and cost. Moreover, in many cases, there is no "best" therapy, but rather a series of options with trade-offs that are highly sensitive to the patient's personal preferences.

There is a set of maturing web-based treatment decision support tools. However, few studies have examined the performance and promise of these products. The tools evaluated in this category were developed by four vendors: BestTreatments, HealthDialog, Healthwise and NexCura. The number and types of conditions and treatments addressed by the tools varies greatly across these vendors.

HealthDialog's Health Crossroads was rated highest among the competing products for its superior handling of patient priorities. The tool helps patients consider their preferences and explains the trade-offs in benefits and risks of alternative treatments, including the option of no treatment, for particular condition-choice scenarios. Health Crossroads crisply frames the decision using key choice attributes and

its content uses familiar language to help demystify complex issues.

All four of these treatment decision support tools fell short in one significant respect: none currently offers any information about treatment costs.

Hospital Choice

Three products were evaluated in the hospital choice area: HealthGrades, Subimo/WebMD and WebMD Select Quality Care. The WebMD Select Quality Care tool was rated highest: it offers a wide array of hospital performance indicators and organizes the information in an intuitive, easy-to-use format. The tool clearly distinguishes the highest and lowest performing hospitals through a summary performance indicator and personalizes coverage-access information by ranking hospitals according to hospital network status.

However, as was the case with the treatment choice tools we evaluated, the services in this category did not provide cost information that is relevant to the user. Additionally, none of these hospital choice tools included information about doctors' hospital affiliations and each have somewhat convoluted decision frameworks which are not well tailored to specific conditions or treatments. This latter shortcoming complicates decision-making by introducing aspects of choice that aren't critical to the decision. For example, the explanation of patient volume as an indicator lacks condition-specific context which is important when considering volume information, nor is there consideration for conditions in which surgeon volume and skill is a greater determinant of outcomes than hospital-wide performance metrics and the value of volume.

None of the three tools educates the user about the distinction between condition-specific and hospital-wide metrics in the context of hospital choice for a particular service.

Personal Cost Decision Support

In this module, UnitedHealthcare's cost estimator out-performed services offered by competing plans (Aetna, Blue Cross of California, CIGNA) and WebMD. UnitedHealthcare's tool integrates the member's benefits coverage and the health plan's contracted fees. Patients can estimate their expected service use; in turn, the estimated costs better fit their circumstances. Users can consider how a possible purchase decision would contribute to meeting deductible and/or out-of-pocket maximum amounts. The tool also shows the purchase decision impact on FSA/HSA account balances and lists the projected value of FSA tax savings.

None of these tools were superior across all performance dimensions. The WebMD and CIGNA tools had relatively good personal account budgeting functions; other tools had no budgeting support whatsoever. Several tools had strong medication cost estimator services but sub-par medical services cost estimator functions. The value of these tools varies in part due to differences in the level of integration with the health plan benefits and claims systems data.

Given the variation in performance among these leading tools, employers and other health insurance program sponsors should communicate the promise and current limitations of consumer decision support tools to employees and other audiences.

Treatment Decision Support

Summary

PBGH evaluated four vendors' treatment choice decision support tools that are available to consumers through health portals sponsored by employers, health plans or other third parties:

- BestTreatments: www.besttreatments.org
- HealthDialog: www.healthcrossroads.com
- Healthwise: www.healthwise.org
- NexCura: www.heartfacts.com,
www.cancerfacts.com

Each tool was evaluated on these performance dimensions:

- Provision of treatment and condition information;
- Effectiveness of decision-support techniques; and
- Website ease of use.

PBGH integrated the consultants' assessments and assigned grades for each decision tool. The findings are presented in **Figure 1**. The PBGH Treatment Option Support Evaluation Framework is presented as **Appendix B**, on page 55.

HealthDialog's Health Crossroads rated highest largely due to its superior decision support techniques. Healthwise was ranked second as it met the key criteria in each of the three evaluation categories. BestTreatments and NexCura have good condition and treatment option content but these tools do not provide meaningful decision-making support.

HealthDialog distinguished itself with its superior attention to patient priorities. HealthDialog's tool helps patients consider their preferences and explains the trade-offs in benefits and risks of alternative treatments, including the option of no treatment for particular condition-choice scenarios. The tool crisply frames the decision using key choice attributes, and its content uses familiar language to help demystify complex issues.

Treatment and Condition Information. All of the tools, except BestTreatments, explain treatment duration, the patient's role during and after treatment, and the treatment's recovery period. Similarly, all four products provide links to evidence of treatment efficacy. The NexCura and BestTreatments tools do not address the comparability of outcomes across treatments nor do they consistently identify the likelihood of treatment benefits and harms. The number and types of conditions and treatments addressed in each of the tools varies greatly.

Effectiveness of Decision-Support Techniques.

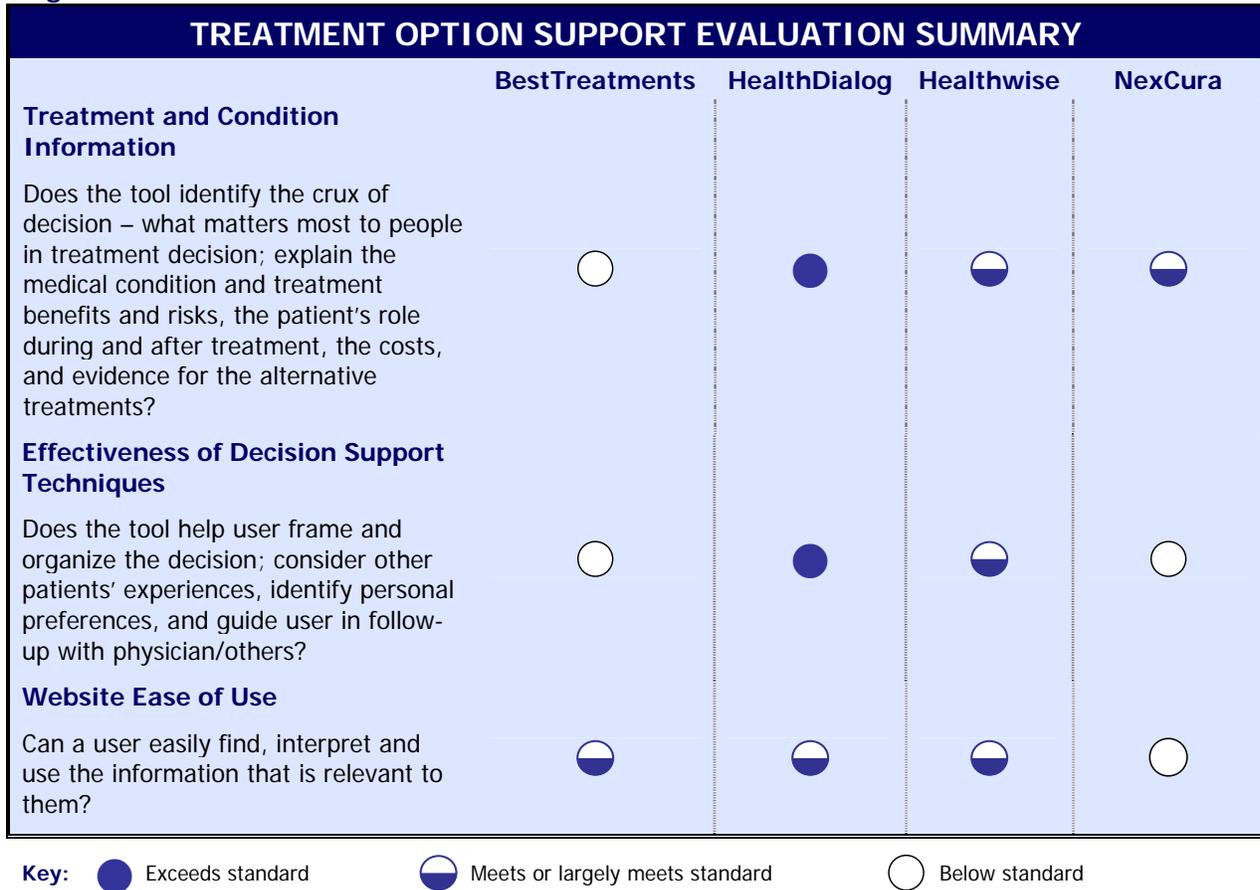
The tools were markedly different in the effectiveness of their decision-support techniques. The HealthDialog and Healthwise tools explain what matters most to people and how they considered their preferences when making a decision through narratives of other patients' decision-making processes. All four products provide guidance about engaging the patient's physician in the treatment decision.

Website Ease of Use. BestTreatments, HealthDialog, and Healthwise meet the ease of use criteria with clear navigation and attractive, readable print formats. In contrast, NexCura's site has high text density, cumbersome navigation and requires a higher literacy level than the other products. The literacy level of all four sites was high for many people, hovering in the 8th-13th grade level range. Ideally, Websites should target their content at or below an 8th grade level reader and include more non-text elements in order to engage a broader audience.

Background

In an era of increasingly complex medical science, ever-evolving therapeutic options, and expanded consumer participation in health care decisions, making the "best" treatment choice can be a

Figure 1.



formidable challenge for patients and their physicians. When choosing among treatment options, patients consider a multitude of factors including efficacy, time to recovery, qualifications of providers, plan coverage, and cost. Moreover, in many cases, there is no “best” therapy, but rather a series of options with trade-offs that vary depending on the patient’s personal preferences and budget.

Today, a patient with chronic back pain may choose between treatment options, physicians, and perhaps even the service location, whether hospital or outpatient facility. The patient considers these options in light of treatment goals, benefit and risk trade-offs, values and personal preferences, provider recommendations, benefits coverage and out-of-pocket costs. In this multi-layered decision-making context, consumer tools can help patients discern components of their care choices that matter to them and navigate among the treatment and provider options.

Fortunately, Web-based treatment decision support tools have matured in recent years to better meet this need. These products provide consumers with trustworthy, pertinent, and personalized information when they need it most. In turn, informed patients are better equipped to participate with their physicians in treatment decision making.

Web-based treatment decision-support tools help consumers navigate this complicated decision-making process. The products provide consumers with trustworthy, pertinent, and personalized information when they need it most – when facing a new diagnosis or difficult medical decision.

Given the benefits of treatment decision-support tools, plans and employers should promote such services to employees through health plan and vendor partners, self-care incentive programs, and internal communications. The utility of treatment decision-support tools would be significantly enhanced by their

integration with information about treatment costs. Not only is it important to connect treatment option information with costs, but it's also necessary to tailor that information based on provider selection and benefit coverage.

In spite of the tools' shortcomings, vendors have made great strides in decision-support functionality and in customizing information to particular health conditions. In many cases, positive health outcomes are defined as much by the patient and his lifestyle as by the provider using more traditional clinical measures. In this context, decision aids help patients identify and achieve their most desirable health outcomes.

Making the "best" treatment choice can be a formidable challenge for patients and their physicians. When choosing among treatment options, patients consider a multitude of factors including efficacy, time to recovery, qualifications of providers, plan coverage, and cost. Moreover, in many cases, there is no "best" therapy, but rather a series of options with trade-offs that vary depending on the patient's personal preferences and budget.

Importantly, treatment decision support tools may deliver dividends for employers as well. In addition to educating patients, decision aids may save money and improve the care experience. Examples of high cost health conditions in commercial population are presented in **Appendix A**. Research indicates patients who use treatment decision support tools are more satisfied with their care decisions; have better understanding of their care instructions; and choose more conservative, less costly treatment options.

Evaluation Methods

The treatment choice tools were evaluated as follows:

(1) PBGH supplied each of the three (3) consulting experts with the PBGH Treatment Option Support Evaluation Framework (**Appendix B**) which is comprised of criteria that are organized into three evaluation categories:

- Treatment and Condition Information;
- Effectiveness of Decision Support Techniques; and
- Website Ease of Use.

(2) PBGH selected five (5) medical conditions/procedures topics: breast cancer, prostate cancer, angina, hypertension and low back pain.

(3) Consulting experts identified one or more patient profiles. For example, two patient profiles were used for the hypertension decision aid assessment:

- A 48-year old woman, newly informed she has high blood pressure, who likely will need to begin some treatment soon.
- A 60-year old man with an established diagnosis of hypertension, currently on medications, who also has several other risk factors for complications of cardiovascular disease.

(4) Each consultant applied the Framework criteria to each vendor tool for the respective condition and patient profile.

(5) PBGH integrated the consultants' assessments and assigned grades for each decision tool using a three-tier grading method represented by the symbols below. The grading criteria are explained in the overview section for each topic.

-  **Exceeds standard** – The tool offers features beyond the primary functionality or content
-  **Meets or largely meets standard** – The primary decision support functionality and content was present
-  **Below standard** – The tool does not offer core decision support functionality or the content is too limited to meet a user's basic needs

Brief descriptions in the tables below highlight each tool's capabilities vis à vis the desired dimensions.

Findings: Treatment and Condition Information

This section assesses how well the tools address the following areas:

- Description and explanation of the medical condition;
- What matters most to people making the decision, including the benefits and risks of the treatment options;
- A patient's role in treatment, including the duration and recovery time;
- Cost of treatment and treatment alternatives, linked to the patient's benefit coverage; and
- Evidence basis for the treatment.

Summary Findings

HealthDialog is superior in explaining what matters most to people considering treatment decisions. The other tools meet the criteria for this critical aspect of the service but the NexCura and BestTreatments

tools do not address the comparability of outcomes across treatments nor do these two tools consistently identify the likelihood of treatment benefits and harms.

The patient's role during and after treatment is explained in all of the tools except BestTreatments. BestTreatments also does not consistently explain treatment duration and recovery period across treatment topics.

None of the tools address cost as an aspect of treatment choice, nor is health plan benefit design addressed as a variable for potential out-of-pocket costs to the patient.

All of the tools provide links to the treatment efficacy evidence but the HealthDialog tool fails to clearly tie its content to the supporting evidence.

Table 1A. Medical Condition		
Criteria		Describes the condition including symptoms and stages of disease and the improvement that can be realized with treatment.
BestTreatments	●	<ol style="list-style-type: none"> 1. Describes condition fully 2. Describes aspects of condition that benefit from treatment 3. Distinguishes the stages/severity of the condition
HealthDialog	●	<ol style="list-style-type: none"> 1. Describes condition fully 2. Describes aspects of condition that benefit from treatment 3. Distinguishes the stages/severity of the condition
Healthwise	●	<ol style="list-style-type: none"> 1. Describes condition fully 2. Describes aspects of condition that benefit from treatment 3. Distinguishes the stages/severity of the condition
NexCura	◐	<ol style="list-style-type: none"> 1. Describes condition fully 2. Distinguishes the stages/severity of the condition 3. Information is not consolidated in a single section – diminishes the value to the reader 4. Explanations of aspects of condition that benefit from treatment are not consistently addressed across topics

Table 1B. Crux of the Treatment Decision		
Criteria		Identifies crux of decision – what matters most to people making the decision. Describes the treatment options and explains if outcomes are comparable. Explains treatment benefits and harms and details likelihood of these events.
BestTreatments		<ol style="list-style-type: none"> 1. Describes alternative treatments and their benefit/harm trade-offs 2. Comparability of outcomes for alternative treatments is not clearly explained 3. Explanation of the likelihood of benefits and harms is incomplete or not integrated with condition content; presented in a separate section of the site
HealthDialog		<ol style="list-style-type: none"> 1. Describes alternative treatments and their benefit/harm trade-offs 2. Explains treatment results and if treatments yield comparable outcomes 3. Discusses side-effects, discomfort/impact of the treatment and impact on quality of life 4. Presents likelihood of benefits and harms
Healthwise		<ol style="list-style-type: none"> 1. Describes alternative treatments and their benefit/harm trade-offs 2. Explains treatment results and if treatments yield comparable outcomes 3. Discusses side-effects, discomfort/impact of the treatment and impact on quality of life 4. Explanation of the likelihood of benefits and harms is not consistently available across topics 5. Some treatment options/accompanying therapies missing.
NexCura		<ol style="list-style-type: none"> 1. Describes alternative treatments and their benefit/harm trade-offs 2. Comparability of outcomes for alternative treatments is not clearly explained 3. Treatment trade-offs are detailed but difficult to compare due to the format 4. Explanation of the likelihood of benefits and harms is incomplete or absent across topics 5. Implications of no treatment not consistently explained across topics

Table 1C. Patient Role in Treatment		
Criteria		Describes patient's and caregivers' roles in treatment, recovery and post treatment; explains duration of treatment and recovery time.
BestTreatments		<ol style="list-style-type: none"> 1. The patient's self-care role is not addressed 2. Addresses treatment duration for most topics
HealthDialog		<ol style="list-style-type: none"> 1. Explains patient self-care role in primary and ongoing treatment 2. Modifiable risk factors and patient's behavior change role are addressed but not in detail
Healthwise		<ol style="list-style-type: none"> 1. Explains patient self-care role in primary treatment and the side-effects of treatment 2. Addresses modifiable risk factors 3. Treatment duration and recovery not consistently addressed across topics
NexCura		<ol style="list-style-type: none"> 1. Explains patient self-care role including modifiable risk factors for most topics 2. Addresses treatment duration and recovery for most topics

Table 1D. Cost of Treatment		
Criteria		Presents the costs of alternative treatments; distinguishes market prevailing prices from patient's actual costs per health benefits coverage.
BestTreatments	<input type="radio"/>	1. No cost or insurance coverage information
HealthDialog	<input type="radio"/>	1. No cost or insurance coverage information
Healthwise	<input type="radio"/>	1. No cost or insurance coverage information
NexCura	<input type="radio"/>	1. No cost or insurance coverage information

Table 1E. Evidence for the Treatment		
Criteria		Provides footnoted citations for the treatment evidence; lists date(s) of most recent review of literature; identifies contributing experts/authors of the site content.
BestTreatments	<input type="radio"/>	<ol style="list-style-type: none"> 1. Each treatment that is reviewed has footnotes with article citations to direct reader to supporting evidence 2. Content preparation authors and contributing experts not clearly identified for specific conditions 3. No date is given for most recent update of pertinent literature
HealthDialog	<input type="radio"/>	<ol style="list-style-type: none"> 1. Bibliography lists pertinent articles but no footnotes are used to link content to supporting evidence 2. Link to PubMed site for article abstracts 3. Lists affiliations of content preparation authors and contributing experts 4. No date is given for most recent update of pertinent literature
Healthwise	<input type="radio"/>	<ol style="list-style-type: none"> 1. Footnotes with article citations direct reader to supporting evidence 2. Bibliography lists pertinent articles; no links to articles 3. Lists qualifications of content preparation authors and contributing experts 4. No date is given for most recent update of pertinent literature
NexCura	<input type="radio"/>	<ol style="list-style-type: none"> 1. Bibliography is personalized to user's clinical situation 2. A key helps reader interpret the strength of the evidence 3. Citations direct reader to supporting evidence; online abstracts 4. Citation footnotes and contributing expert qualifications are not consistently available across topics; content preparation authors/contributors is unclear

Findings: Effectiveness of Decision-Support Techniques

These criteria are applied to assess how each tool helps the user frame and organize the decision by:

- Presentation of a small number of treatment attributes with identification of the most important aspects of the decision
- Eliciting personal preferences
- Provision of patient narratives to reveal how patients with a similar condition have made a decision
- Guiding the patient in using the information to help make a decision or communicate with a physician.

These decision-support techniques can then guide the user through the decision-making process and provide strategies and questions for communicating with physicians and family.

Summary Findings

The HealthDialog and Healthwise tools distinguish themselves by integrating decision-support techniques into their services. Such decision-support techniques are missing from the BestTreatments and NexCura tools.

HealthDialog and Healthwise support patients in considering their preferences and present patient narratives to inform users about typical patient preferences; the other two tools do not provide this support.

All of the tools provide guidance about engaging the patient's physician in the treatment decision. HealthDialog has a phone service to follow-up with a health coach for additional guidance; the other three tools supply questions to ask your doctor.

Table 2A. Organize and Frame the Treatment Options		
Criteria		Organizes the treatment options' performance/characteristics into a small number of attributes; identifies the most important aspects of the decision. Provides side-by-side comparisons of the treatment options.
BestTreatments	<input type="radio"/>	<ol style="list-style-type: none"> 1. No framing of the decision to guide user in considering the treatment options 2. No side-by-side comparisons of treatment options
HealthDialog	<input checked="" type="radio"/>	<ol style="list-style-type: none"> 1. Decision is framed with an explicit set of attributes 2. Aspects of the decision are organized in a hierarchy of importance 3. Compares treatments side-by-side
Healthwise	<input checked="" type="radio"/>	<ol style="list-style-type: none"> 1. Decision is framed with an explicit set of attributes 2. Aspects of the decision are organized in a hierarchy of importance (although mixing of clinical attributes and preferences is confusing) 3. Compares treatment 'decision points' side-by-side
NexCura	<input type="radio"/>	<ol style="list-style-type: none"> 1. No framing of the decision 2. Lists advantages and disadvantages of each treatment option but does not synthesize into a small number of key attributes 3. No side-by-side comparison of treatment options 4. User personal information is collected and applied in the decision support – for instance, questions to discuss with doctor are tailored

Table 2B. Elicit Patient Preferences		
Criteria		Identifies the aspects of choice that matter to most patients and prompts user to consider aspects that matter most to them.
BestTreatments	<input type="radio"/>	1. Patient preferences are not elicited
HealthDialog	<input checked="" type="radio"/>	1. Patient preferences and values are emphasized in treatment selection 2. Provides user with a questionnaire to consider preferences
Healthwise	<input checked="" type="radio"/>	1. Patient preferences and values are emphasized in treatment selection 2. Provides user with an interactive worksheet to consider preferences
NexCura	<input type="radio"/>	1. Patient preferences are not elicited

Table 2C. Provide Patient Narratives		
Criteria		Provides narratives so user can consider the choices made by patients who have identified their preferences.
BestTreatments	<input type="radio"/>	1. No patient narratives
HealthDialog	<input checked="" type="radio"/>	1. Patient narratives are presented with a balance of patient perspectives 2. Actual patients, with photos included, convey the ambiguities of real decision-makers
Healthwise	<input type="radio"/>	1. Patient narratives are presented with a balance of patient perspectives 2. These appear to be hypothetical patients
NexCura	<input type="radio"/>	1. No patient narratives 2. Main site includes patient perspectives but these are not condition-specific

Table 2D. Guide User in Follow-up After Using the Tool		
Criteria		Explains purpose of tool and how information can be used in decision-making process. Provides questions to discuss with doctor/family. User has option to talk to a professional who is trained in treatment choice counseling for the given condition.
BestTreatments	<input type="radio"/>	1. The role/purpose of the tool is explained on the main site 2. Tool provides questions to ask physician
HealthDialog	<input checked="" type="radio"/>	1. The role/purpose of the tool is explained - shared decision-making is emphasized 2. Explains the role of pertinent health professionals 3. Health coach service available by phone
Healthwise	<input type="radio"/>	1. The role/purpose of the tool is explained - shared decision-making is emphasized 2. Provides a decision sheet for user to complete and share with physician 3. Includes medical test information form to help user discuss tests with physician
NexCura	<input type="radio"/>	1. The role/purpose of the tool is explained on the main site 2. User is encouraged to consider questions to discuss with their physician throughout use of tool

Findings: Website Ease of Use

This section describes the consumer's experience in using the Web tool, including:

- Organization, interpretability and readability of the tools' contents;
- The web tools' user interfaces such as the site architecture and the user's navigation experience;
- Communication in everyday language that can be understood by users with varying reading levels;
- Capture of information in printed outputs that the consumer can use; and
- Display of security safeguards in the event the consumer inputs personal information.

Summary Findings

Three of the tools meet the ease of use criteria with clear navigation, attractive formats and readable print formats. NexCura does not meet the ease of use standard as the site has high text density, cumbersome navigation and requires a higher literacy level.

The four sites' literacy levels hover in the 8th-13th grade level range – exceeding the preferred 8th grade level. HealthDialog uses non-text elements more extensively to explain data to lower numeracy level users.

Table 3A: Content Format and Appearance		
Criteria		Attractive page density through a balance of text, white space and images or photos. Text is easy to read (12-14 point font). The format cues users about the organization and location of the content.
BestTreatments		<ol style="list-style-type: none"> 1. Simple clean design uses short, easy to read text passages, with mix of white space and text 2. 12-point font
HealthDialog		<ol style="list-style-type: none"> 1. Attractive low text density; organized in brief paragraphs and bulleted lists. Easy to read due to mix of text, graphics, tables and pictures. 2. 9-point font is harder to read
Healthwise		<ol style="list-style-type: none"> 1. Attractive balance of text, images and white space. 2. Font size ranges from 12-14 point
NexCura		<ol style="list-style-type: none"> 1. High density of text with scant use of non-text elements 2. 10-point font is harder to read

Table 3B. Site Architecture and Navigation		
Criteria		The navigation is intuitive with consistent, prominent placement of navigation elements (e.g., buttons, tabs, menus). If tool is nested within a larger site, user can instantly find and initiate the decision aid and navigate from the decision aid to related content on main site. Text links to pop-ups to easily retrieve reference/explanatory information.
BestTreatments		<ol style="list-style-type: none"> 1. Navigation is easy and clear – left-side menu for tool and top menu for site 2. It is cumbersome for the user to navigate between tool and the main site which houses important supplemental content
HealthDialog		<ol style="list-style-type: none"> 1. Navigation is easy and clear – left-side menu
Healthwise		<ol style="list-style-type: none"> 1. Navigation is easy and clear – right-side menu
NexCura		<ol style="list-style-type: none"> 1. Navigation between tool and main site is cumbersome as user must reenter password protected logon to access tool 2. Tool requires more effort to learn to use given need to enter personal information 3. Some of the navigation elements are not intuitive – there is no left-side or top bar to navigate from linked material

Table 3C. Interpretability		
Criteria		The content is communicated in everyday language at an 8th grade reading level. Avoids mixing measurement types (e.g., 1 in 10 and 10%). Communicates quantitative information with supplemental devices like graphs or images for lower numeracy level users.
BestTreatments		<ol style="list-style-type: none"> 1. Uses everyday language (SMOG* 9.5-11.5) 2. Missing graphs/other elements to explain statistics to lower numeracy level users 3. Video explaining risk is helpful content but difficult to find 4. Mix of numbers and text to describe probabilities is confusing.
HealthDialog		<ol style="list-style-type: none"> 1. Uses everyday language (SMOG 8-13.5) 2. Text supplemented with photos, graphs and pictures 3. Consistent use of statistics to describe probabilities.
Healthwise		<ol style="list-style-type: none"> 1. Uses everyday language (SMOG 8.5-13) 2. Text supplemented with images 3. Likelihood of outcomes presented as simple probabilities but missing graphs/non-text elements to explain probabilities to lower numeracy level users.
NexCura		<ol style="list-style-type: none"> 1. Higher literacy level required (SMOG 13.5-16.5) 2. Largely a text-only site except for 'treatment outcomes report' section which uses graphs and images.

*Simplified measure of gobbledygook – a readability formula that translates to grade reading level.

Table 3D. Printing and Security		
Criteria		Tool has a 'print report' function to print a 'condition report'. Format for printing function is available to print a page in a readable format. For users entering personal information, prominently communicates security safeguards.
BestTreatments		<ol style="list-style-type: none"> 1. Can create and print condition report (pdf) 2. Personal information is not entered
HealthDialog		<ol style="list-style-type: none"> 1. Can create and print condition report (pdf) 2. Individual pages print in readable format 3. Personal information is not entered.
Healthwise		<ol style="list-style-type: none"> 1. Can create and print condition report (pdf) 2. Individual pages print in readable format 3. Personal information is not entered.
NexCura		<ol style="list-style-type: none"> 1. Can create and print condition report (pdf) 2. Individual pages print in readable format 3. Session information is saved 4. Security safeguards for personal information prominently communicated

Hospital Choice

Summary

PBGH evaluated three vendors' hospital choice decision support tools that are available to consumers through health portals sponsored by employers, health plans or other third parties:

- HealthGrades: www.healthgrades.com
- Healthcare Advisor, formerly Subimo: www.bluecrossca.com
- WebMD Select Quality Care, formerly HealthShare: www.webmdqualityservices.com

Experts identified the performance information evidence for hospital mortality, complication and treatment volume indicators for each of ten (10) common, elective procedures. Each tool was evaluated on these performance dimensions, with the results summarized in **Figure 2**.

The PBGH Hospital Choice Decision Support Evaluation Framework is summarized in **Appendix C**

on page 58, and is comprised of criteria that are organized into three evaluation categories:

- Hospital performance information;
- Effectiveness of decision-support techniques; and
- Website ease of use.

WebMD Select Quality Care met or exceeded the standard for each of the three evaluation categories and was rated highest among the three tools evaluated. Healthcare Advisor and HealthGrades were comparably rated: each met key criteria in selected categories but lacked important decision-support functions.

Hospital Performance Information. Healthcare Advisor and WebMD Select Quality Care report comparable sets of performance metrics on volume, treatment complications and mortality, and patient safety. The HealthGrades tool uses a relatively

Figure 2.

HOSPITAL CHOICE EVALUATION SUMMARY			
	HealthGrades	WebMD Select Quality Care	Healthcare Advisor
Hospital Performance Information			
Does the tool report the available hospital performance and features information and are the performance indicators accurately presented?			
Effectiveness of Decision Support Techniques			
Does the tool help user frame and organize the decision; narrow the search to relevant hospitals and compare hospitals on aspects of performance that match their interests and that are meaningful indicators for a given treatment?			
Website Ease of Use			
Can a user easily find, interpret and use the information that is relevant to them?			

Key: Exceeds standard Meets or largely meets standard Below standard

limited set of condition-specific performance measures largely based on Medicare cases.

Effectiveness of Decision-Support Techniques.

To improve decision-making quality and reduce decision-making effort, the tools deliver on one promise – all three identify the highest and lowest performing hospitals. Healthcare Advisor and WebMD Select Quality Care tools rank the hospitals based on preference weights and performance results. The HealthGrades tool presents the user with the option of viewing hospitals' 'overall quality rating' or a summary quality rating based on the condition-specific survival/complication rate compared to the expected rate. However, none of the tools explicitly frame the hospital choice decision; and the approaches to elicit user preferences are flawed. The tools do not help users understand the relevance and meaning of the listed user preferences.

Website Ease of Use. The team assessed how readily users can find, interpret and make use of the hospital choice information provided by each tool. In this category, the HealthGrades tool was rated highest among the three competing products due to its user-friendly format and immediate presentation of summary results. HealthGrades is the only tool that includes a hospital profile with an affiliated physician search function.

WebMD Select Quality Care's navigation scored well with its conventional but intuitive presentation; Healthcare Advisor requires six (6) clicks to reach summary results. However, Healthcare Advisor's distinctive architecture had several advantages: it couples treatment decision support with the hospital choice functionality, includes questions about insurance coverage, and provides users with questions to ask a physician. The other tools do not provide users with this type of follow-up help. All three tools' content interpretability was sub-par.

Background

Numerous studies have documented pervasive disparities in hospital quality, safety and pricing of services. These inconsistencies present a challenge for patients who, when faced with an illness or serious condition, must sift through complex, sometimes impenetrable data to find a high quality

and affordable provider, if indeed relevant quality and usable information are available for their condition.

Web-based hospital choice tools can help consumers focus their search by providing reliable, pertinent and personalized information on hospital performance. These tools may also serve plan and employer goals to direct patients to higher quality, higher value providers, thereby improving consumer engagement and reducing employee use of low-quality facilities with high complication rates.

A patient can use hospital choice tools for a number of purposes. For example, a patient in need of knee replacement surgery can use a hospital choice tool to find nearby hospitals that perform this procedure; to view a ranking of facilities by performance; and find a summary of complication rates for knee replacement procedures at each facility. Determining if a patient's provider practices at that hospital or assessing out-of-pocket costs are important services that are not typically offered by these tools today.

Importantly, these tools use relative rather than absolute performance ratings – performance is assessed relative to other hospitals rather than benchmark criteria – it's unclear if higher rated hospitals are actually "high performers" simply because they score above the reference hospitals. An opportunity for future improvement is to distinguish between condition-specific and hospital-wide performance metrics and to clarify the limitations of hospital-wide metrics in the context of hospital choice for a particular service.

The hospital choice decision needs to be placed in the context of relevant performance information and meaningful hospital attributes. It can be difficult for a consumer to differentiate factors such as clinical quality, length of stay or organizational characteristics and their relative impact on the patient's hospital stay. Improvements in the tools would help consumers identify their preferences for factors that are central to hospital performance and that could affect their hospital experience.

The positioning of such tools in health plan Websites can influence the utility of summary information. One benefit of a customized health plan portal is the

ability to link consumers to a health plan's specific hospital network, including its Centers of Excellence. The ability to link affiliated physicians is also important.

Similar to the evaluation of treatment choice tools, a major shortcoming among current hospital choice tools is the lack of information about the patient's share of the costs. Despite limited charge-based information in some tools, cost data is not adjusted for benefit design and insurance coverage. Other opportunities for improvement include tailoring the decision frameworks to specific conditions or treatments and restricting the decision-making to aspects of choice that are meaningful to the patient's experience.

Evaluation Methods

The three vendor's hospital choice tools are available to consumers through health portals sponsored by employers, health plans or other third parties. PBGH evaluated the HealthGrades Website that is limited by password to subscribers. A different version of HealthGrades' Hospital Report Card decision aid is available to the general public at no charge. PBGH evaluated a version of the Healthcare Advisor tool that has been customized for Blue Cross of California. A customized version of the WebMD tool, Select Quality Care, was accessed through Blue Shield of California's mylifepath.com site and a demo site provided by WebMD Quality Services.

The three hospital choice tools were evaluated as follows:

(1) PBGH prepared a Hospital Choice Decision Support Evaluation Framework (**Appendix C**) that is comprised of criteria organized into three (3) evaluation categories:

- Hospital Performance Information,
- Effectiveness of Decision Support Techniques, and
- Website Ease of Use.

(2) PBGH identified ten (10) elective procedures that are among the most common, largely non-emergent inpatient services provided to working people who are commercially insured.

- Laminectomy
- Mastectomy and lumpectomy
- Coronary artery bypass surgery
- Angioplasty
- Caesarean section delivery
- Hip replacement
- Knee replacement
- Abdominal aortic aneurysm repair
- Colorectal resection
- Hysterectomy

(3) Consulting experts identified the performance information evidence for hospital mortality, complication and treatment volume indicators for each of the ten (10) elective treatments. In turn, this evidence was used to assess the measures that are reported for each of the ten treatments.

(4) For each of the three evaluation categories, PBGH and/or consulting experts applied the criteria to compare the hospital choice tools.

(5) PBGH assigned grades for each decision tool using a three-tier grading method represented by the symbols below. The grading criteria are explained in the overview section for each topic.

-  **Exceeds standard** – The tool offers features beyond the primary functionality or content
-  **Meets or largely meets standard** – The primary decision support functionality and content was present
-  **Below standard** – The tool does not offer core decision support functionality or the content is too limited to meet a user's basic needs

Findings: Hospital Performance Information

This section examines the types of hospital features and performance metrics that are included in each of the choice tools:

- Patient treatment volume;
- Treatment mortality;
- Treatment complications;
- Patient safety;
- Doctor affiliation with hospital
- Hospital out-of-pocket costs for patient;
- Patient-reported hospital experiences; and
- Other performance indicators.

Summary Findings

Healthcare Advisor and WebMD Select Quality Care report comparable sets of performance metrics on volume, treatment complications and mortality, and patient safety. None of the three tools educates the user about the distinction between condition-specific and hospital-wide performance metrics and the value of hospital-wide metrics in the context of hospital choice for a particular service. The explanation of patient volume as an indicator lacks any condition-specific context, nor is there consideration for conditions in which surgeon volume and skill is a greater determinant of outcomes than hospital volume. The tools also use relative

performance ratings – a hospital's performance is rated relative to other hospitals. As such, it is unclear if higher performing hospitals are excellent performers or simply score higher than the reference hospitals.

HealthGrades tool scored lowest among the three tools for comprehensiveness of performance metrics. The site uses a relatively limited set of condition-specific performance measures. Additionally, HealthGrades' performance information is largely based on Medicare cases though this is not readily apparent to the user. In some instances, HealthGrades' definitions of treatment topics aggregates multiple treatments into a single topic (e.g., 'gynecological surgery' rather than hysterectomy, ovarian cyst removal, etc.) which are less relevant topics for consumers.

These versions of the vendor's tools do not support key aspects of consumer hospital choice: the patient's share of the costs and a doctor's hospital affiliation with the exception of HealthGrades doctor search. Though it is cumbersome to navigate to the doctor search, a HealthGrades user can view a doctor's hospital affiliations.

Table 4A. Patient Treatment Volume

Criteria		<p>If treatment-specific patient counts are presented as a proxy for hospital experience and outcomes, the tools should put patient volume in context to avoid misleading users by implying that volume equates to quality. The tools should present the Leapfrog research that has identified a small set of treatments for which there is evidence that higher volume is related to better outcomes. Tools should address topics of interest to commercial populations - particularly high frequency elective procedures.</p>
HealthGrades	○	<ol style="list-style-type: none"> 1. The source of patient volume counts is unclear; it appears that Medicare patient volume only is reported for most services. Commercial patient volume, from 17 states, is reported for selected services (e.g., appendectomy, bariatric surgery, maternity care and women's health). 2. Upwards of 90 conditions/procedures are rated; primary audience of commercially insured consumers can be misled by Medicare-only volume counts. 3. Leapfrog evidence based referral volume status is not presented as a stand-alone indicator for the applicable services. 4. Presents information on 7 of the 10 key elective procedures reviewed. 5. No consideration for conditions in which surgeon volume and skill is a greater determinant of outcomes than hospital volume.

Table 4A. Patient Treatment Volume		
WebMD Select Quality Care		<ol style="list-style-type: none"> 1. All-patient volume for each treatment (100+ treatments) put in context with area average for each treatment. 2. Leapfrog evidence based hospital referral volume standard available under "other evals" tab but this information is missing for several key conditions (e.g., angioplasty and CABG). 3. Preferences section explanation of patient volume as an indicator lacks condition-specific context which is important when considering volume information. 4. Presents information on all the 10 key elective procedures reviewed. 5. No consideration for conditions in which surgeon volume and skill is a greater determinant of outcomes than hospital volume.
Healthcare Advisor		<ol style="list-style-type: none"> 1. All-patient volume and severely ill patient volume for more than 90 treatments. 2. Leapfrog evidence based referral text grade displayed on the detail page of performance summary. 3. Preferences section does not explain condition-specific context which is important when considering patient volume information. 4. Presents information on all of the 10 key elective procedures reviewed. 5. No consideration for conditions in which surgeon volume and skill is a greater determinant of outcomes than hospital volume.

Table 4B. Treatment Mortality		
Criteria		Hospital mortality through 30 days post discharge is a meaningful outcomes indicator for selected treatments. Tool should not report mortality rates for those treatments for which death is rare and/or the treatment volume is low so it is misleading to differentiate hospital performance.
HealthGrades		<ol style="list-style-type: none"> 1. Mortality 'star' grades (3) "as expected", "better than expected" and "worse than expected." 2. Predicted vs. actual % survival rate via drill-down; in-hospital and 180 days. 3. About 70% of hospitals' survival results rated "as expected" for any given treatment. 4. Of 10 major elective procedures reviewed, presents survival for two conditions in which low death rate and/or procedure frequency dilutes ability to differentiate hospitals: angioplasty and abdominal aortic aneurysm repair.
WebMD Select Quality Care		<ol style="list-style-type: none"> 1. Mortality grades (3) "top 25th percent", "middle 50th percent" and "bottom 25th percent." 2. Area average % mortality rate puts death rate in context; inpatient mortality only. 3. Of 10 major elective procedures reviewed, presents mortality for three conditions in which low death rate and/or procedure frequency dilutes ability to differentiate hospitals: colorectal resection, angioplasty and abdominal aortic aneurysm repair.
Healthcare Advisor		<ol style="list-style-type: none"> 1. Mortality text grades (3) "as expected", "better than expected" and "worse than expected." 2. Context information not shown in hospital comparison; inpatient mortality only. 3. Of 10 major elective procedures reviewed, presents mortality for two conditions in which low death rate dilutes ability to differentiate hospitals: total hip replacement and abdominal aortic aneurysm repair.

Table 4C. Treatment Complications		
Criteria		Complications, such as infections, blood clots and bleeding, that are related to the treatment or hospital stay are a meaningful outcomes indicator for selected treatments. Complications are underreported as some are not documented and others not measured as they occur after the hospital stay. Tool methods should mitigate error in which comorbidities that are present on admission are classified as complications.
HealthGrades		<ol style="list-style-type: none"> 1. Major complication 'star' grades: "as expected", "best" and "poor" based on actual vs. predicted comparisons (% patients with one or more major complications). 2. Complication rates are not available for treatments for which mortality rates are shown (when complication rate is reported, mortality is considered a major complication).
WebMD Select Quality Care		<ol style="list-style-type: none"> 1. Complication grades: "top 25th percent", "middle 50th percent" and "bottom 25th percent". 2. In addition to the grade, a complication index, which is based on number & severity of complications and uses an index area average of 100, is reported but it not interpretable by a typical user. Presentation of this index on the detail page is counterintuitive as a longer bar means poorer performance. 3. Reporting indicates if hospital rate is significantly different than area average. 4. Displays % rates for 10+ complication categories in drill down.
Healthcare Advisor		<ol style="list-style-type: none"> 1. Complication text grades: "as expected", "better than expected" and "worse than expected". The meaning of "as expected" grade is unclear. 2. Confusing that infection and post-operative infection rates reported separately from overall complication rate. Incidence of infections that are complications of the inpatient stay is low for number of treatments – measure validity is suspect for these topics.

Table 4D. Patient Safety		
Criteria		The Leapfrog measures are industry standard safety indicators that should be a prominent element of a hospital performance summary. Leapfrog's 3 safety measures (self-reported by hospitals) concern hospital use of a specially trained intensivist to monitor ICU patients, use of a computerized physician order entry system to reduce medication prescribing errors and an index of 27 patient safety practices.
HealthGrades		<ol style="list-style-type: none"> 1. Not shown on performance summary. 2. User can expand performance summary to display a star rating for the Leapfrog safe practices (ICU Staffing, Overall Safe Practices and Computerized Drug Ordering) and for the AHRQ 13 patient safety indicators.
WebMD Select Quality Care		<ol style="list-style-type: none"> 1. Not shown on performance summary. 2. Reports 3 Leapfrog indicators and preventive antibiotics status under "other evals" tab.
Healthcare Advisor		<ol style="list-style-type: none"> 1. Not shown on the performance summary. 2. Reports 3 Leapfrog indicators' text grades displayed on the detail page under Hospital Patient Safety Practices. The text grade is a conversion of the Leapfrog standard to a Healthcare Advisor legend. A text link retrieves the safe practices index status per the Leapfrog standard and the CMS preventive antibiotics indicator.

Table 4E. Doctor Affiliation with Hospital		
Criteria		Checking a physician's hospital affiliation is a fundamental hospital choice tool need. Consumers may be interested in the hospital privileges of an attending doctor or of a doctor(s) who they are considering for their care. This feature is dependent upon the sponsor of the tool (e.g., health plan or employer) and the extent of customization. As such, evaluation of this feature is not generalizable – it is particular to the reviewed versions of the tools.
HealthGrades	<input checked="" type="radio"/>	<ol style="list-style-type: none"> 1. User opens individual hospital profiles by clicking on hospital name and initiates a search for affiliated physicians at that hospital. 2. Tool can be customized to associate physician's insurance network status.
WebMD Select Quality Care	<input type="radio"/>	<ol style="list-style-type: none"> 1. No information.
Healthcare Advisor	<input type="radio"/>	<ol style="list-style-type: none"> 1. No information.

Table 4F. Hospital Out-of-Pocket Costs for Patient		
Criteria		The patient's share of the hospital fee is determined by that person's health insurance coverage. Typically patient costs are fixed per day or stay copayments or a percentage (e.g., 20%) of the hospital contracted fee. This feature is dependent upon the sponsor of the tool (e.g., health plan or employer) and the extent of customization. As such, evaluation of this feature is not generalizable – it is particular to the reviewed versions of the tools.
HealthGrades	<input type="radio"/>	<ol style="list-style-type: none"> 1. No information.
WebMD Select Quality Care	<input checked="" type="radio"/>	<ol style="list-style-type: none"> 1. Optional step to narrow set of candidate hospitals using "hospital network" status to distinguish which hospitals are in plan network. 2. Summary report lists hospitals per their billed charges quartile rank (1,2,3 or 4). The cost tab presents the hospital's relative billed charges grade using a four-part, lowest cost to highest cost grading method (also displays a general cost range). 3. The cost information is not relevant to user's insurance coverage.
Healthcare Advisor	<input type="radio"/>	<ol style="list-style-type: none"> 1. Shows treatment's billed charges range for each hospital. 2. The information is not relevant to user's insurance coverage.

Table 4G. Patient-reported Hospital Experiences		
Criteria		The Hospital-CAHPS patient survey results are not available as of the date of this review. A vendor's approach to integrating existing patient survey data, such as the California PEP-C survey, which is a regional data set, signals the flexibility of the tool's architecture and adaptability of the tool's scoring approach to support patient experience results.
HealthGrades	<input type="radio"/>	<ol style="list-style-type: none"> 1. No information.
WebMD Select Quality Care	<input checked="" type="radio"/>	<ol style="list-style-type: none"> 1. Not shown on summary report page. 2. Under "other evals" tab, patient experience is reported when available via regional reporting. For example, California PEP-C Survey star grades are reported for each of seven (7) survey domains.
Healthcare Advisor	<input checked="" type="radio"/>	<ol style="list-style-type: none"> 1. Not shown on summary report page. 2. On detail page, patient experience is reported when available via regional reporting. For example, California PEP-C Survey text grades using 'above average', 'average' and 'below average' categories are reported for two (2) summary ratings.

Table 4H. Other Performance Indicators		
Criteria		The relevance and utility for consumers of general hospital characteristics and accreditation status are questionable (e.g., 98% of hospitals are accredited). The tool should assist users in learning about hospital characteristics that are relevant to a particular treatment and/or are a general signal about the hospital's capabilities.
HealthGrades	<input type="radio"/>	<ol style="list-style-type: none"> 1. JCAHO accreditation, number of beds, ownership category and HealthGrades hospital service ratings for 10 service line categories 2. CMS Appropriate Care measures for heart attack, heart failure, pneumonia and surgical infection prevention are reported. 3. Most of these features are not treatment-specific and the tool fails to explain their relevance to an individual's hospital decision.
WebMD Select Quality Care	<input type="radio"/>	<ol style="list-style-type: none"> 1. Presents length-of-stay as a primary quality indicator in the summary performance set, although there is not strong evidence to support using length-of-stay as an efficiency indicator in consumer choice applications. 2. Reporting from the CMS hospital quality initiative on use of preventive antibiotics, which includes top decile benchmark and national average comparisons, is a valuable addition for surgical admissions though it is difficult to find under 'other evals' tab.
Healthcare Advisor	<input type="radio"/>	<ol style="list-style-type: none"> 1. Presents hospital reputation, measured in NRC consumer polling and Joint Commission (formerly JCAHO) accreditation status. 2. Also reports on various hospital services and features such as number of high technology services, teaching hospital status and availability of ICU and CICU services. Most of these features are not treatment-specific and the tool fails to explain their relevance to an individual's hospital decision.

Findings: Effectiveness of Decision Support Techniques

The tools' effectiveness in improving decision-making quality and reducing decision-making effort are evaluated by examining how readily users can:

- Frame the decision using choice attributes that matter;
- Narrow the search to relevant hospitals;
- Compare hospitals on aspects of performance that are meaningful given the treatment;
- Reflect the user's preferences; and
- Distinguish better and poorer performing hospitals.

Summary of Findings

The highest and lowest performing hospitals are distinguished in each of the three tools. Healthcare Advisor and WebMD Select Quality Care tools rank the hospitals based on preference weights and performance results. The HealthGrades tool presents user with the option of viewing hospitals' 'overall quality rating' or a summary quality rating that is the condition-specific survival/complication actual to expected rate.

None of the tools explicitly frame the hospital choice decision. WebMD Select Quality Care and Healthcare Advisor organize the choice attributes into a set of topics but flawed preferences elicitation muddies the framing of the choice decision. Healthcare Advisor engages the user in considering preferences to narrow the candidate hospitals list but, given the limitations of the Healthcare Advisor preferences set, this can detract from identifying the best hospital candidates. HealthGrades does not frame the hospital choice decision nor does it organize choice attributes in a manner to help users consider aspects of choice that may matter most to them.

The vendors' functionalities for eliciting user preferences are flawed. The WebMD Select Quality Care and Healthcare Advisor pre-defined sets of preferences include factors that are weakly related to the value of a consumer's hospital stay. The tools' do little to help users understand the relevance and meaning of the listed preferences. HealthGrades offers no user preferences functionality.

Table 5A. Describe Crux of Hospital Choice Decision

Criteria		Tool should explain the aspects of choice that are important to most people. Tool should explain if there are important differences in treatment results across hospitals (particularly in a local market); the incidence of harmful outcomes including death, complications and avoidable errors; and the relevance of performance information/other attributes that are not specific to the treatment/condition (e.g., safety and patient experience).
HealthGrades	○	<ol style="list-style-type: none"> 1. Tool does not explicitly frame the hospital choice decision. 2. There is no context information explaining what matters to people in choosing a hospital. 3. The results page lists the condition-specific survival/complication performance followed by three hospital-wide indicator sets yet there is no information to help user distinguish condition-specific and hospital-wide performance information. 4. There is no information about the overall differences in treatment results.
WebMD Select Quality Care	○	<ol style="list-style-type: none"> 1. Tool does not explicitly frame the hospital choice decision but it organizes choice attributes into 6 topics. 2. The preferences section lists 5 attributes of choice but this generic list is irrelevant or misleading for a host of treatments, and particularly flawed given lack of contextual explanation. 3. There is no information about the overall differences in treatment results; the general hospital performance indicators are somewhat obscured under the "other evals" tab. 4. The preferences and introductory information do not address doctor affiliation with hospital or patients actual costs. 5. There is no explanation of the applicability of general performance information in the hospital choice.

Table 5A. Describe Crux of Hospital Choice Decision		
Healthcare Advisor		<ol style="list-style-type: none"> 1. The "What Are the Risks" section identifies the treatment's potential harms that occur in the hospital (death, complications, infection). 2. The tool does not explicitly frame the hospital choice decision; e.g., given these potential harms what should patients consider in their hospital choice. 3. The tool organizes the choice attributes into selected categories: treatment-specific (volume, mortality, complications), patient safety, patient experience and other hospital factors. 4. The preference section identifies 10-12 aspects of hospital choice but it doesn't explain what is most relevant for the particular treatment (the default importance values are an obscure cue). 5. The preferences and introductory information do not address doctor affiliation with hospital or patient's actual costs. 6. There is no explanation of the applicability of general performance information in hospital choice.

Table 5B. Apply 'Must Have' Criteria to Create Candidate List of Hospitals		
Criteria		User can enter zip code or city and designate treatment/condition to focus search on convenient hospitals that provide the service. Candidate hospital list identifies insurance network status. User can search for hospitals according to personal/attending physician affiliation. User can search by named hospital or hospital characteristics.
HealthGrades		<ol style="list-style-type: none"> 1. User enters zip code or city, travel distance and designates a treatment/condition or search for best 'overall quality rating'. 2. User also can search by named hospital. 3. Threshold results are the survival/complication rating or the 'overall quality rating', number of cases and proximity (can resort hospital list by any of three attributes). 4. Insurance network status can be added as a customized setup feature. 5. User can proceed by selecting subset of listed hospitals for full comparison of performance and features. 6. If user clicks on hospital name, the hospital-specific profile page includes specialty search for affiliated physicians and results provide array of physician characteristics (this feature isn't apparent to user). A doctor search by name function is available but not as primary search and it is difficult to find. 7. No out-of-pocket cost search parameters.
WebMD Select Quality Care		<ol style="list-style-type: none"> 1. User enters zip code or city, travel distance and designates treatment/condition. 2. User can search by named hospital or hospital characteristics. 3. Candidate hospitals listed with address, distance, patient volume and insurance network status; user can sort hospital list on these features. 4. Insurance network can be customized to the plan. 5. Tool sponsor (e.g., health plan or other purchaser) can limit hospitals eligible for comparison based on patient volume thresholds. 6. No doctor affiliation information.
Healthcare Advisor		<ol style="list-style-type: none"> 1. User enters zip code or city, travel distance and designates treatment/condition. 2. User can search by named hospital or hospital characteristics. 3. Candidate hospital list identifies insurance network status, distance, address and hospital match score. 4. No doctor affiliation information. 5. No out-of-pocket cost search parameters.

Table 5C. Users Consider Their Preferences

Criteria		<p>Tool should educate the user about the meaningful choice factors, help user focus on their relevant factors and process an array of information. Tool should categorize choice attributes in a hierarchy of most-to-less important and safeguard user against using misleading/incomplete information. Functionality provides default priorities and user can modify the defaults.</p>
HealthGrades	○	<ol style="list-style-type: none"> 1. The tool has no user preferences functionality, i.e., no explicit step to help user identify and consider relevant aspects of choice. 2. On search page, the 'help' link opens a set of four bubble text statements that begins to explain user preferences but the content is too limited and link isn't prominent. 3. The 'more information' icon opens window with text and video stream that is a good step in explaining search for condition-specific vs. hospital-wide performance.
WebMD Select Quality Care	○	<ol style="list-style-type: none"> 1. User registers preferences for five aspects of hospital performance: patient volume, mortality rates, complication rates, lengths of stay and costs (average charges). 2. Brief explanations of topics are insufficient. The cost and length of stay topics are misleading or difficult to interpret: is shorter or longer stays good or bad? Is higher or lower billed charges (not out-of-pocket costs) good or bad? 3. Preferences list is not treatment sensitive – conditions with very low death rates include mortality. 4. Default preference selections include "very important" in instances in which mortality and/or complication rate is not relevant to inpatient treatment.
Healthcare Advisor	○	<ol style="list-style-type: none"> 1. User registers preferences in four categories of hospital performance: clinical quality (patient volume, mortality, complications), public perception (reputation and accreditation), safety practices (Leapfrog Safety Index and CMS process indicators) and hospital characteristics (teaching hospital, primarily treats children and has high technology services, ICU and CICU). 2. The clinical preferences list is context-specific for mortality topic, i.e., the mortality attribute does not appear for conditions with low death rates. 3. The tool is inadequate in helping users identify key preferences. Brief explanations of preferences topics are insufficient. 4. Several topics are misleading or difficult to interpret (e.g., accreditation given that 98% of hospitals are accredited). 5. The 5 structural measures should not be preference attributes as it is unclear how these hospital features would influence a patient's experience and the lengthy set of choice attributes unwisely complicates the user's task of identifying top preferences.

Table 5D. Summarize Major Aspects of Choice and Distinguish Performance

Criteria		<p>Tool should help user process the information by summarizing information into a small, digestible number of topics displayed on a single page. Summary topics should be balanced – of roughly equal importance. Tool should highlight hospital performance differences on major aspects of choice using grading or scoring indicators (avoid rankings given false precision). Reference norms should be easily understood and tool should report a best achieved benchmark. Treatment-specific vs. hospital-wide indicators are clearly distinguished. Scoring technique minimizes performance misclassification. Tool makes scoring method transparent so user can understand it.</p>
HealthGrades	○	<ol style="list-style-type: none"> 1. Tool provides a summary hospital grade and ranking for: a) the condition-specific survival/complication rate or b) an 'overall quality rating' – an aggregation of survival/complication and hospital-wide safety and appropriate care results. 2. Hospital case volume, largely based on Medicare data, is the only other condition-specific performance indicator. 3. One of three star grades is presented for survival/complication based on an actual to expected formula. This grading system is not transparent to user – there is no explanation of the performance differences that distinguish 'best', 'as expected' and 'poor' grades. The star grades are misleading as a top grade of 5 stars suggests that the grading spectrum uses all 5 stars but only 3 grades are used (5 star best; 3 star as expected; 1 star poor). This problem is compounded by consumer typical behavior to 'count up' all the stars on the page to distinguish best and worst performers. 4. The 'overall quality rating' defines 'best' as top 15% hospitals, poor as bottom 15% and average as middle 70% of hospitals. 5. Grade terms like "poor" and "as expected" suggest absolute ratings but 'overall quality rating' is a relative indicator. 6. This mix of rating formulas leads to uninterpretable results in which a hospital has a 5 star 'overall quality rating' yet all of the constituent parts that follow are 3 star results. 7. The 'overall quality rating' is based on Medicare data and Leapfrog safety results. 8. There is no explanation of the hospital ranking formula (e.g., rank 1, 2, 3) – given small differences among hospital survival/complication rates this ranking formula likely is misleading.
WebMD Select Quality Care	◐	<ol style="list-style-type: none"> 1. Tool provides a summary hospital grade using a 3-tier formula: "top 25th percent", "middle 50th percent" and "bottom 25th percent" derived from the user's preferences and the hospital's performance. Hospitals that score at the boundary of a percentile threshold may be graded incorrectly. 2. The summary grade formula is not transparent and disclosed to user. 3. It is unclear how the user preferences are incorporated into the scoring formula, which is a significant flaw given that formula is sensitive to user preferences and the preferences function has major drawbacks (described above). 4. The grading formula is a relative distribution of results - unclear if "top 25th percent" in that local market is good performance or if it is meaningfully different than the next quartile of performance. 5. No top performance benchmark results are reported.

Table 5D. Summarize Major Aspects of Choice and Distinguish Performance

Healthcare Advisor		<ol style="list-style-type: none">1. Tool provides a summary hospital match score (0-100) derived from the user preferences and the hospital's performance. The match score formula is not disclosed to the user.2. The summary page omits any preferences that user marked as low importance; the remaining choice factors are presented as equally important (e.g., hospital reputation, accreditation and complication rates appear equal).3. The summary grade formula is not transparent and disclosed to user.4. Ranking of hospitals on preference match at this stage heightens importance of the preference match formula – no information is available to explain the formula. This is a serious shortcoming given that a number of the 10-12 preference items may not be compelling hospital choice factors for many users.5. The 0-100 continuum implies that the hospital performance is distinguished in a ordinal rank-order which is misleading.6. An 80% confidence interval is used to assign grades for the mortality and complication indicators.7. No reference norms or top performance benchmarks are reported.
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Findings: Website Ease of Use

Four aspects of the tools' ease of use characteristics are examined to assess how readily users can find, interpret and use the hospital choice information:

- Site architecture and navigation;
- User interface and content format;
- Content interpretability; and
- User guidance for follow-up after using the tool.

Summary Findings

HealthGrades navigation is superior given its ease of use and immediate presentation of summary results. WebMD Select Quality Care's navigation is the most conventional and intuitive – the information is organized in two layers with a tab format guiding the user to second layer results. Healthcare Advisor's initial path is cumbersome as it requires six clicks to reach summary results; once the results are displayed the navigation is streamlined as it displays the information on summary and single detail pages.

All three (3) tools' content interpretability had significant drawbacks though WebMD Select Quality

Care and HealthGrades presented clear, summary hospital rankings. HealthGrades has an attractive, unified format that consistently displays a star icon to report performance. HealthGrades superior format is achieved in part because it presents fewer condition-specific performance indicators. Healthcare Advisor lacks a summary performance display, its preferences match score is not interpretable and its use of three different sets of text legends is confusing. WebMD Select Quality Care's second information tier is weakened by statistical legends that are difficult to interpret and counter-intuitive bar charts. "Significantly different than average" may be clearly understood by a researcher or provider, but may be less meaningful to a consumer.

Healthcare Advisor's distinctive architecture couples treatment decision support with the hospital choice functionality. Healthcare Advisor provides questions to ask your physician along with insurance coverage questions. The other tools do not provide the user with this type of follow-up help after using the tool.

Table 6A. Navigation		
Criteria		The navigation is intuitive with consistent, prominent placement of navigation elements (e.g., buttons, tabs, menus). All core pages are available from any page. Hospital comparisons reached within 3-4 clicks of start page.
HealthGrades		<ol style="list-style-type: none"> 1. Straightforward navigation by entering search criteria on single page and summary results displayed on second page. 2. Key search criteria is "best quality overall" or "best quality for a condition/procedure." 3. User selects any number of the hospitals that met search criteria to compare more performance ratings and features. On this full results page, user views all the comparison information using +/- navigation to hide or expand performance indicators. 4. One click completes hospital search (state, area, proximity and treatment/condition).
WebMD Select Quality Care		<ol style="list-style-type: none"> 1. Familiar, tab navigation process. 2. Persistent links for new search, change preferences and change hospitals. 3. Top of page navigation to related functions outside hospital choice tool. 4. Text link navigation to detail on types and percentages of complications is too subtle - difficult for user to easily recognize this path to additional content. 5. Three clicks completes hospital search (includes preference selections).

Table 6A. Navigation		
Healthcare Advisor		<ol style="list-style-type: none"> 1. Navigation is cumbersome: user cannot easily move back and forth across the summary, detail and 'compare interests' pages - various user selections are not stored during the session; if user changes preferences then must reselect hospitals. 2. User preferences are displayed in left-hand frame as reminder and convenient path to modify preferences. 3. The persistent top frame navigation supports use of related, but distinct content (community forum, condition topics, etc.) 4. Six clicks to reach comparison of hospital summary results.

Table 6B. Content Format and Appearance		
Criteria		Displays the page's core content above the fold where it is instantly seen upon opening the page. Minimizes page scrolling: limit to a single 'page down' step to view the bottom-most content on a page. Attractive page density realized through balance of text, white space, images/other visuals. Easy to read text using 12-14 point type. The format should provide side-by-side hospital comparisons and not limit the number of hospitals that can be compared.
HealthGrades		<ol style="list-style-type: none"> 1. Attractive page density achieved through more limited set of performance indicators – allows positioning of performance and features content in a horizontal format. 2. Hospitals compared side-by-side and no limit to number of hospitals. When 4 or more hospitals selected, user loses side-by-side comparison with right scroll as hospitals are organized in a column format. 3. Easy to read text. 4. Star legend at top of table; information icon opens text and video stream. 5. Performance indicator comparisons are part of the initial screen; scroll down page to view hospitals' features.
WebMD Select Quality Care		<ol style="list-style-type: none"> 1. Performance table with hospital ranking & results is always visible. 2. Table format is clear; summary info is appropriately positioned on left side of table. 3. Legend and interpretative content below table is useful information but less visible at the bottom of the screen (and it is more important than generic content visible above table). 4. Attractive page density. Hospitals compared side-by-side and no limit to number of hospitals.
Healthcare Advisor		<ol style="list-style-type: none"> 1. Attractive page density achieved through use of table format on summary and detailed results pages. 2. Limits comparison to 3 hospitals to position hospitals side-by-side along horizontal axis. 3. Summary results page displays topics important to user (high/medium importance) above the fold or with minimal scroll. 4. Results categories are listed in left-hand column; text label (high/medium/low importance) is not a useful cue as it is not prominent. 5. Small point size text more difficult to read.

Table 6C. Content Interpretability and Readability*

Criteria		<p>Summary performance display is key to integrating and interpreting results. Consistent performance indicators (e.g., stars, text terms, etc.) should be used throughout site – avoid mixing indicator types (e.g., stars and numbers). Symbol/text grades are preferred to numeric performance scores (e.g., 88%) but numbers are appropriate for certain displays. Uses topic labels (e.g., row and column titles) that clearly explain the content. Text for a broad audience should be at an 8th grade reading level. Uses text links to pop-ups that explain key terms/concepts.</p>
HealthGrades		<ol style="list-style-type: none"> 1. Tool provides a summary hospital grade and ranking for: a) the condition-specific survival/complication rate or b) an 'overall quality rating' which combines survival/complication and hospital-wide safety and appropriate care results. A star icon performance indicator is consistently used. 2. The actual to expected percentages are displayed in the expanded view. 3. Grading system is not transparent to user – there is no explanation of the performance differences that distinguish 'best', 'as expected' and 'poor' grades. 4. The mortality and complication predicted vs. actual concept is inherently complex and difficult to interpret. 5. The 'more information' icon opens a text and video stream that is an appealing presentation format. 6. Though there is a persistent link to the ratings information help content, the explanation of the data sources and ratings methods is incomplete. 7. 12.0 grade reading level.
WebMD Select Quality Care		<ol style="list-style-type: none"> 1. Summary ranking system (top 25, middle 50, bottom 25) delineates hospitals' performance clearly using 3 symbols (plus/minus/neutral circles). 2. No explanation of the overall rank. 3. Mortality and complication rate legends lack cues to guide user interpretation: "significantly different than average" is unclear whether this is good or bad, and length of bar chart is difficult to interpret given heuristic of 'longer is better'. Also unclear whether user should integrate the length of bar and the significance statement. 4. 'Area average' reference limits interpretation - is the "average" good or mediocre performance? 5. Useful presentation of "about this chart", "legend" and "methodology" below each performance display. 6. Generic intro text for each display is of little utility. 7. 10.7 grade reading level.
Healthcare Advisor		<ol style="list-style-type: none"> 1. Summary hospital match score (0-100) is a black box – no means to understand it. 2. Excluding the "hospital match score" which blends preferences and performance, there is no summary performance indicator(s) - requires user to integrate multiple performance indicators. 3. The vertical order of hospital attributes provides a cue to hierarchy of importance. 4. Uses 3 text grade legend sets ("as expected", "meets standard", "average") which is a more difficult comprehension chore for user - hard to synthesize these different text grades into an overall result. These grades should be explained directly on the page. 5. Pop-up explanations of all key terms available on screen but no general help function. 6. 12.0 grade reading level.

*Flesch-Kincaid method applied to assess reading level (syllables per word and words per sentence).

Table 6D. User Guidance for Follow-up After Using Tool		
Criteria		Tool has a 'print report' function to print all key information in a readable format. Provides user with "questions to ask" about your hospital choice and stay. Provides user with information about insurance coverage for hospital stay.
HealthGrades		<ol style="list-style-type: none"> 1. Tool has a 'print' function to print information on the page – user can select sections of the results information to print. 2. No "questions to ask" when choosing a hospital are provided.
WebMD Select Quality Care		<ol style="list-style-type: none"> 1. Tool has a 'print report' function to print information for the treatment topic from the core pages. 2. No "questions to ask" when choosing a hospital are provided.
Healthcare Advisor		<ol style="list-style-type: none"> 1. Tool has a 'print this page' function. 2. Tool has "questions to ask your physician" that are treatment/condition-specific 3. Also provides general questions to ask about your insurance coverage.

Personal Cost Decision Support

Summary: Treatment and Service Cost Estimator

PBGH evaluated five healthcare cost estimator and budgeting decision support tools that are available to consumers through health portals sponsored by employers, health plans or other third parties. This evaluation includes tools provided by three nationwide health plans – Aetna, CIGNA and UnitedHealthcare – as well as Blue Cross of California and the cost estimator decision support services offered by two leading vendors: WebMD and Ingenix.

- Aetna: www.aetna.com
- Healthcare Advisor, formerly Subimo: www.bluecrossca.com
- WebMD: www.webmdqualityservices.com
- CIGNA: www.mycigna.com
- UnitedHealthcare: www.myuhc.com

The evaluation addressed multiple dimensions that were broadly organized into the following categories:

- Chronic condition care cost estimator functions;
- Medications cost estimator functions;
- Website ease of use;
- Personal account budgeting functions; and
- Effectiveness of decision-support techniques.

Using these criteria, PBGH and consulting experts tested the cost support tools under a series of common scenarios that reflect how typical patients might utilize the services. PBGH assigned grades for each decision tool, using a three-tier rating method as summarized in **Figures 3 and 4**.

Figure 3.

TREATMENT AND SERVICE COST ESTIMATOR EVALUATION SUMMARY					
	Aetna	Blue Cross of California (Subimo)	CIGNA	United Healthcare / (Ingenix)	WebMD
Medical Cost Estimator					
Does tool personalize cost estimates to member's benefits coverage and health plan contracted fees?	○	○	○	●	○
Can user tailor expected service use for ongoing care cost estimates and obtain annual expected costs?					
Medication Cost Estimator					
Does tool personalize cost estimates to member's benefits coverage and health plan contracted fees?					
Does tool automatically compare equivalent alternative medications including generic & OTC and compare retail vs. mail-order? Are alternatives easily compared? Are medication lower cost alternatives automatically presented?	◐	○	◐	◐	●
Ease of Website Use					
Can a user easily find, interpret and use the information that is relevant to them?	●	◐	◐	●	●

Key: ● Exceeds standard ◐ Meets or largely meets standard ○ Below standard

Additional observations on Website ease of use are summarized in the tables that follow. This section is organized differently than the discussion of treatment choice decision support and hospital choice tools. The detail tables are organized by plan rather than each individual evaluation criterion. Cost and budgeting tools are often integrated with different parts of a plan's Website, with varying linkages to treatment option choice and provider choice, along with the member's historical claims information located in transactional areas of the organization's Website. The summary and evaluation of Personal Account Budgeting are presented beginning on page 46.

Medical Cost Estimator. UnitedHealthcare's (UHC) medical cost estimator rated highest while the other four services did not meet the core requirement to adjust costs based on the member's benefits coverage. UHC's tool allows patients to estimate their expected service use so that cost approximations better fit their circumstances. Users can see how a potential purchase decision would impact their progress towards meeting a deductible and reaching out-of-pocket maximum amounts. The tool also shows such estimates in FSA/HSA account balances and lists the projected value of FSA tax savings.

Medication Cost Estimator. WebMD's medication cost estimator rated highest due to its benefits coverage-specific cost information and superior decision support functions. The user is prompted to consider alternatives including generics and other therapeutically equivalent medications with cost comparisons provided. The Aetna, CIGNA and UHC tools display out-of-pocket costs based on the member's benefit coverage.

Website Ease of Use. The WebMD tool distinguished itself in providing treatment cost estimates for a number of chronic conditions (e.g., asthma, arthritis, hypertension, diabetes, depression, osteoporosis, migraines, cancers) and surgeries, diagnostic tests and therapies (e.g., x-rays and scans, office visits, vaccinations, allergy shots, labs, eye exams). Geographically-specific charges are derived from a national charge database, with estimated service counts and cost ranges by service type (e.g., office visit, test). However, costs are not based on members' coverage.

Background

Personal cost decision support tools have been launched relatively recently with the introduction of consumer-directed, or account-based products. As health care costs have increased, patients have become more price-conscious and sought greater transparency in navigating the complex interface between benefits, cost and health care delivery.

Today several Web-based services allow patients to gauge their out-of-pocket costs for a variety of care needs: prescription drugs, acute care and chronic conditions. Although standalone prescription drug calculators were not reviewed for this study, a number of health plans, PBMs, and third-party vendors have robust tools to inform drug choices, substitution options, and generic equivalents. As a whole, such tools are more mature because drug information has been broadly available and discrete unit pricing is more readily understood.

Other cost-estimation and budget-support tools assist users with budgeting for HSA and FSA accounts and help them assess their tax savings compared to potential out-of-pocket dollars. Additional tools allow patients to check costs for specific treatments and services. The latter is made more complicated because pricing for medical services often bundles related diagnostic and ancillary services that may accompany a routine office visit. However, the utility of such tools is limited absent integration with the user's benefit design and health plan's contracted provider rates.

Finally, patients rarely make treatment decisions on the basis of price alone; other considerations include quality of provider options and relative treatment effectiveness. Cost estimation and decision-support tools should integrate price data with these other key dimensions of care choice.

Fortunately, healthcare decision support tools have been developed in recent years that begin to meet consumer demand in this area. Specifically, employers, health plans, and other third parties have pioneered Web-based services that allow patients to gauge their out-of-pocket costs for a variety of care needs: prescription drugs, acute care and ongoing chronic conditions.

As is the case with any decision-support tool, the ability to tailor information to the individual consumer is critical. Tailoring health care pricing information to the patient's treatment scenario is complex. In many cases, consumers require a cost estimate for an episode of care rather than a discrete service. For example, a patient with back pain may want to estimate the overall treatment cost, including a doctor's visit, an MRI and pain medication. Tools that parse costs into discrete units – a much easier estimate to generate – rather than episodes of care may not provide a valuable service to consumers. The level of integration with health plan benefits and claims systems data represents a major opportunity for the enhancement of current tools.

Evaluation Methods

PBGH created a Personal Cost Decision-support Evaluation Framework (**Appendix D**) in consultation with actuarial advisors. The results are reported based on an aggregate plan/vendor level.

The cost estimator and budgeting decision support tools were evaluated as follows:

(1) PBGH's Personal Cost Decision Support Evaluation Framework is comprised of criteria organized into the following evaluation categories:

- Chronic Condition Cost Estimator Functions
- Treatment, Diagnostics and Others Services Cost Estimator Functions
- Medications Cost Estimator Functions
- Website Ease of Use.

(2) PBGH applied the criteria to each of the decision support tools using several consumer vignettes:

- An individual, who was recently diagnosed with a chronic condition, is identifying personal costs for the upcoming year given her current insurance coverage.
- An individual, with an acute health problem, is identifying personal costs for a treatment episode that includes an assortment of professional and facility services given his current insurance coverage.
- An individual, with an ongoing health problem, is identifying personal cost for medications given her current insurance coverage. Lower cost alternatives are an important consideration as the medications are expected to be a lifetime therapy.

(3) PBGH assigned grades for each decision tool using a three-tier grading method represented by the symbols below. Brief descriptions highlight each tool's capabilities vis à vis the desired dimensions.

-  **Exceeds standard** – The tool offers features beyond the primary functionality or content
-  **Meets or largely meets standard** – The primary decision support functionality and content was present
-  **Below standard** – The tool does not offer core decision support functionality or the content is too limited to meet a user's basic needs

Findings: Treatment and Service Cost Estimator, Aetna

Table 7A.

Decision support functions	Aetna Health Plan Website Functionality	Areas for Improvement
Chronic condition cost estimator	 <ol style="list-style-type: none"> 1. Treatment cost estimates provided for a number of chronic conditions (e.g., asthma, high blood pressure, diabetes, minor depression, CHF, lung disease, osteoporosis, migraines, obesity etc.) 2. Cost presented as average dollar value for user-selected severity level (e.g., low, medium, high) 3. Total cost and cost amount by major service type (e.g., doctor, pharmacy, facility, tests) 4. Costs in-network defined as average PPO allowed amount per year 5. Cost are not based on member's coverage 6. Costs per local area – user zip code 	<ol style="list-style-type: none"> 1. Integrate user's benefits coverage to provide user costs per coverage 2. Explain cost data: a) are the cost estimates for the current time period and b) is "average" the actual average or a percentile of allowed/billed charges? 3. Explain the utilization assumptions for conditions or episode of care 4. Provide estimated out-of-network costs for conditions
Treatment, diagnostics and other services cost estimator	 <ol style="list-style-type: none"> 1. Cost estimates provided for 4 diagnostic/therapy categories: dental procedures, surgical & scope procedures, office visits and diagnostic tests & vaccines 2. Cost presented as average dollar value for user-selected severity level (e.g., low, medium, high) 3. Total cost and cost amount by major service type (e.g., doctor, pharmacy, facility, tests) 4. Costs in-network defined as average PPO allowed amount per year 5. Costs out-of-network defined based on allowed vs. paid claims factor per year 6. Cost are not based on member's coverage 7. Costs per local area – user zip code 8. Cost comparison presents in-network vs. out-of-network 	<ol style="list-style-type: none"> 1. Integrate user's benefits coverage to provide user costs per coverage
Medications	 <ol style="list-style-type: none"> 1. Medication search by: a) state, b) drug name (<u>type down</u>) c) quantity, d) days supply and e) dose 2. Medication cost comparisons: 30-day retail and 90 day mail order supply 3. Generic drugs are not automatically displayed; user is prompted to consider alternatives including generics but requires user to initiate new search and new cost comparisons replace original requested drug in table 4. Lists member's out-of-pocket cost per benefits coverage 5. Compares retail vs. mail order out-of-pocket cost 6. List preferred (formulary) vs. non-preferred status 7. Presents amount applied to member's deductible and personal account 	<ol style="list-style-type: none"> 1. List generic drug and associated cost/savings on same screen as brand name drug so member can determine personal savings (logic flags generic equivalent but user must start new search for that drug) 2. Add a cost savings/difference result when comparing retail vs. mail or generic vs. brand

Findings: Treatment and Service Cost Estimator, Aetna

Table 7B.

Ease of use	Aetna Health Plan Website Functionality	Areas for Improvement
Content format and interpretability	<ul style="list-style-type: none"> 1. Balance of text and white space; 12-point font 2. Cost figures displayed side-by-side for in-network and out-of-network and for medications, retail and mail-order 3. Uses everyday language 4. Moderate page scrolling is effective approach to organizing information on single screen 	
Search and personalize functions	<ul style="list-style-type: none"> 1. Search function by 6 major categories: prescriptions drugs, dental procedures, surgical & scope procedures, office visits, diagnostic tests & vaccines and diseases & conditions 2. For each of the 6 categories, presents a drop-down list of topics and condition-specific categories as second step to select pertinent services/conditions 3. Cost information is tailored to locale per user zip code and user selects severity level for conditions (low, medium, high) guided by one sentence explanation of each severity level for that condition 	<ul style="list-style-type: none"> 1. Medication search: automatically display generic/OTC medication alternatives in the initial comparison table; current functionality requires user to select generic/alternative medication from list below cost comparison table and this spawns a new search
Navigation and access to reference information	<ul style="list-style-type: none"> 1. Straightforward navigation with topic selection steps on first page, zip code and severity on second page and cost results presented on third page. Can readily change severity/location. 2. Right-hand navigation to find pertinent providers and condition/service information content and top navigation to the sections of the Aetna website including benefits coverage, claims and self-care tools 3. Educational content per Healthwise and Intellihealth links (not context sensitive); Healthwise content includes "Decision Point" to help user consider pros/cons of diagnostic tests and therapies 4. General tips to reduce expenses information 5. 'Aetna pharmacy' educational content including purpose of medication, side effects, contraindications and dosing 	<ul style="list-style-type: none"> 1. For medications, provide easier search function with common list of drugs and/or drug categories
Miscellaneous functions: print, security, session retention	<ul style="list-style-type: none"> 1. Provides printer-friendly version of the page 2. No personal identifiable information is requested/used 3. No budget functionality – no need for session retention and data export 	

Findings: Treatment and Service Cost Estimator, Blue Cross of California

Table 7C.

Decision support functions	Blue Cross Health Plan Website Functionality	Areas for Improvement
Chronic condition cost estimator	<input type="radio"/> <ol style="list-style-type: none"> 1. Treatment cost estimates provided for 10 chronic conditions (e.g., allergies, arthritis, hypertension, diabetes, hypothyroidism, sinusitis, rheumatoid arthritis, etc.) 2. Costs in-network defined as average allowed charges using national charge database 3. Costs out-of-network defined as average billed charges using national charge database 4. In-network and out-of-network compared side-by-side 5. Cost range is displayed but the range is not explained 6. Cost can be tailored to age-band, gender and area by zip code 7. Common services/therapies itemized – no utilization per person or per episode 8. Primary data source is Pharmedics supplemented by Solucient outpatient procedures data 	<ol style="list-style-type: none"> 1. Cost based on contracted fee schedule* 2. Cost customized to user's benefits coverage 3. Provide an annual use per person and functionality for user to customize their expected utilization experience <p>*Though tool can use health plan client's cost data many Subimo clients use the Subimo national cost data</p>
Treatment, diagnostics and other services cost estimator	<input type="radio"/> <ol style="list-style-type: none"> 1. Cost estimates provided for numerous diagnostics, visit types, procedures and therapies 2. Costs in-network defined as average allowed charges using national charge database 3. Costs out-of-network defined as average billed charges using national charge database 4. In-network and out-of-network compared side-by-side 5. Cost range is displayed but the range is not explained 6. Cost can be tailored to age-band, gender and area by zip code 7. Primary data source is Pharmedics supplemented by Solucient outpatient procedures data 	<ol style="list-style-type: none"> 1. Cost based on contracted fee schedule 2. Cost customized to user's benefits coverage
Medications	<input type="radio"/> <ol style="list-style-type: none"> 1. Medication search by drug name or list of 60+ conditions – organizes drug options by drug classes and explains purpose and contraindications for each drug class; explains drug cost considerations including generic options; explains potential side-effects 2. Identifies generic equivalent drugs and OTC options 3. Costs based on general average charge; not based on member's benefits coverage 4. No information about drug's status regarding health plan's formulary 5. Compares brand vs. generic medication monthly cost 6. User can change the dose or quantity 7. Detailed support to help user identify questions to ask doctor about specific medications 8. Educational content including purpose of medication, side effects, contraindications and warnings; describes drug classes pertinent to treating the condition 	<ol style="list-style-type: none"> 1. Cost customized to user's benefits coverage 2. Cost based on contracted fee schedule 3. Explanation of pertinent drug classes and detailed comparisons of drugs is available for select conditions only; can research details on all listed drugs but these are individual searches with no comparisons

Findings: Treatment and Service Cost Estimator, Blue Cross of California

Table 7D.

Ease of use		Blue Cross Health Plan Website Functionality	Areas for Improvement
Content format and interpretability		<ol style="list-style-type: none"> 1. Balance of text and white space; 12-point font 2. Cost figures displayed side-by-side for in-network and out-of-network 3. No total cost figure for an episode of care or per annum for chronic condition 4. Uses everyday language 5. Minimal page scrolling 	<ol style="list-style-type: none"> 1. Explain cost range – uses 25th-75th percentile but this is not explained. 2. Difficult to interpret condition cost estimates without a total (total is absent because tool does not provide utilization assumptions for treatment of chronic condition or episode of care)
Search and personalize functions		<ol style="list-style-type: none"> 1. Can personalize cost information to age-band, gender and area by zip code 2. Ease of search is supported by menu of category topics including diagnostic tests, conditions, medications, inpatient procedures, outpatient procedures, office visits and dental services 	<ol style="list-style-type: none"> 1. Add severity adjustor for condition and major treatment costs. The age/gender factor is blunt adjustor that often does not affect costs.
Navigation and access to reference information		<ol style="list-style-type: none"> 1. Straightforward navigation through 3 sections: topic area, customize information and estimate costs 2. Left-hand navigation to “topic home” is path to extensive menu of related topics including treatment option support, explanation of condition and treatment risks, questions to ask doctor, etc. The “questions to ask your doctor” are tailored to the health topic. The “what should I expect” section explains the typical services that a patient receives during the year for the pertinent condition including the likelihood of hospital and emergency care. 	<ol style="list-style-type: none"> 1. Make “Topic Home” more prominent link and improve link label to explain the available resources 2. Improve approach to explain a service within an episode of care or chronic condition. Current drill down is awkward as it takes user to a single service (x-ray) with little added information
Miscellaneous functions: print, security, session retention		<ol style="list-style-type: none"> 1. Provides printer-friendly version of the page 2. No personal identifiable information is requested/used 3. No budget functionality – no need for session retention and data export 	

Findings: Treatment and Service Cost Estimator, CIGNA

Table 7E.

Decision support functions		CIGNA Health Plan Website Functionality	Areas for Improvement
Chronic condition cost estimator		<ol style="list-style-type: none"> 1. Search by state to retrieve state-level pdfs for 17 recurrent illnesses and 17 chronic diseases 2. Costs presented as average billed charges per episode (facility, physician and drugs) 3. No in-network vs. out-of-network categorization 4. Costs per state area 5. Costs are not based on member's coverage 6. Costs are not trended to current time period; based on 2004-2005 claims data 	<ol style="list-style-type: none"> 1. Integrate user's benefits coverage to provide user costs per coverage 2. Provide cost estimates for in-network vs. out-of-network costs 3. Provide search functionality to select a condition or service of interest
Treatment, diagnostics and other services cost estimator		<ol style="list-style-type: none"> 1. Search by state to retrieve state-level pdfs for a set of 36 common office visit, x-ray and office tests and for 34 common illnesses 2. Costs presented as average billed charges per episode (facility, physician and drugs) 3. No in-network vs. out-of-network categorization 4. Costs per state area 5. Costs are not based on member's coverage 6. Costs are not trended to current time period; based on 2004-2005 claims data 	<ol style="list-style-type: none"> 1. Integrate user's benefits coverage to provide user costs per coverage
Medications		<p><i>Medication Price List</i></p> <ol style="list-style-type: none"> 1. Medication search by: a) enter drug name, b) select a drug category or c) select one of 10 categories: analgesics, lipotropics, hypotensive, SSRIs, contraceptives, gastric acid reducers, blocking agents, thyroid hormones, penicillins, NSAIDS. Lists a set of commonly used medications in each category 2. Presents member's drug benefit design with cost-sharing for each drug tier (e.g., generic, brand, non-preferred brand) 3. Search by drug category yields an alpha-ordered list of all covered drugs in that category and classifies each drug by designated tier (generic, preferred brand non-preferred brand, and 4th tier) 4. No cost figures are presented <p><i>Tel-Drug Compare</i></p> <ol style="list-style-type: none"> 1. Tel-Drug pricing service (Argus Health) reports member cost for a medication and any generic equivalent. Search for retail cost at network pharmacy or search Tel-Drug home delivery for 90-day supply 	<ol style="list-style-type: none"> 1. Improve the user experience: the three medication cost comparison tools are not organized in a structure to help user meet their need – "which one do I use?" (price estimates differ considerably for same RX)

Findings: Treatment and Service Cost Estimator, CIGNA

Table 7E, cont.

Decision support functions		CIGNA Health Plan Website Functionality	Areas for Improvement
Medications <i>(Cont.)</i>		<i>WebMD Drug Compare</i> 1. Medication search by: a) quick list, b) condition or c) medication full list 2. Medication cost comparisons: 30 day retail and 90 day home supply 3. User is prompted to consider alternatives including generics and other therapeutically equivalent medications with cost comparisons in subsequent rows of table (drugs organized by generic, preferred-brand and non-preferred brand) 4. Lists member's out-of-pocket cost per benefits coverage 5. Compares generic, preferred-brand, and non-preferred brand medication out-of-pocket cost 6. Compares retail vs. mail order out-of-pocket cost 7. User can select aspects of medications including side-effects, indications, contraindications and drug interactions. The interactions checker compares the drugs in cost compare search with all drugs in user's personal health record on CIGNA site. Side-effects are classified as more frequent, less frequent and rare.	

Table 7F.

Ease of use		CIGNA Health Plan Website Functionality	Areas for Improvement
Content format and interpretability	○	1. The State-level pdfs do not meet needs of an online user	1. Provide as an interactive web applet not a pdf
Search and personalize functions	○	1. The State-level pdfs do not meet needs of an online user	1. Provide as an interactive web applet not a pdf
Navigation and access to reference information	○	1. The State-level pdfs do not meet needs of an online user 2. Add a medication to user's personal health record per left-hand navigation	1. Provide as an interactive web applet not a pdf
Medication features (WebMD)	●	1. Straightforward navigation with medication search by: a) "quick list" of common medications, b) condition or c) medications listed by name 2. Detailed explanation of the medication through popup that opens Healthwise page for that drug	
Miscellaneous functions: print, security, session retention	●	1. Provides printer friendly version of the page.	

Findings: Treatment and Service Cost Estimator, CIGNA

Table 7G.

Decision Support Techniques	CIGNA Health Plan Website Functionality	Areas for Improvement
Categorize service use	 <ol style="list-style-type: none"> 1. User enters expected number of services for 8 medical categories (e.g., preventive care visit, office visits, hospital stay, outpatient surgery, mental health visits, emergency care) 2. User enters expected number of prescriptions for medications in personal health record or for general categories of generic, preferred brand and non-preferred brand medications 3. User can designate expected service use as in-network or out-of-network 	<ol style="list-style-type: none"> 1. Add lab/x-ray utilization category as this is most common service or clarify if costs include these services 2. Clarify if inpatient hospital service includes professional services or limited to facility services 3. Does not meet need of users who have difficulty estimating service use by categories – alternative would be to replace national average estimate defaults with several typical utilization categories for healthy and sick individuals
Calculator functions	 <ol style="list-style-type: none"> 1. User enters expected service use for self and separately for “dependents” 2. User can enter expected service use or use default “national average” service use counts 3. User enters total dollar amount for expected dental and vision out-of-pocket costs 4. User can enter rollover from HRA or HSA account 5. User can adjust expected service use on-the-fly when comparing costs by plan 6. Presents amount of HRA and HSA account balance net of expected costs 	<ol style="list-style-type: none"> 1. National average service use values are not helpful for many individuals given the large range in utilization experiences and the limits of the precision of national average estimates by category. 2. Provide calculator support for dental and vision out-of-pocket costs; at a minimum provide average costs for most common dental and vision services
Insurance coverage personalization	 <ol style="list-style-type: none"> 1. Cost are not based on insurer’s fee schedule/ allowed charges 2. Applies user’s benefits coverage for each health plan 3. Applies user’s benefits coverage accumulation rules 4. Benefits coverage values and rules are pre-loaded; user does not have to enter 5. Presents employer contribution to HRA or HSA and can lower the HSA balance if user wishes to not apply all of the HSA monies to costs in upcoming year 6. Itemizes user costs by key components (premium deductible, coinsurance, co-pay, prescriptions, other, uncovered expenses) and personal funds applied to show total costs 7. User can expand detail to view cost by health plan by each category (preventive care, etc.) 	<ol style="list-style-type: none"> 1. Determine costs based on health plan’s fee schedule average for a locale

Findings: Treatment and Service Cost Estimator, UnitedHealthcare

Table 7H.

Decision support functions	UnitedHealthcare Functionality	Areas for Improvement
Chronic condition cost estimator	<ul style="list-style-type: none"> 1. Treatment cost estimates provided for a number of chronic conditions (e.g., asthma, arthritis, hypertension, diabetes, depression, CHF, lung disease, migraines, cancers) 2. Costs in-network defined as average allowed amounts: doctor, facility, RX, tests categories 3. Costs out-of-network defined as average billed amount 4. Cost are based on member's coverage 5. Costs per local area – user state/city 6. Cost comparison is per year for in-network vs. out-of-network 7. Utilization per each service can be modified by user and recalculated on-the-fly 8. View how cost would affect current deductible and annual maximum accumulation amounts 9. View how cost would affect FSA or HSA balances 	<ul style="list-style-type: none"> 1. Explain cost data source and if cost estimates are for the current time period – relevant to user's cost today 2. Explain if averages are adjusted by geographic area
Treatment, diagnostics and other services cost estimator	<ul style="list-style-type: none"> 1. Cost estimates provided for numerous procedures, visit types, therapies and medications 2. Cost estimates for episodes of care (e.g., vaginal delivery) lists discrete services for the episode including hospital, professional, diagnostic, etc. 3. Costs in-network defined as average allowed amounts: doctor, facility, RX, tests categories 4. Costs out-of-network defined as average billed amount 5. Cost are based on member's coverage 6. Costs per local area – user state/city 7. Cost comparison is in-network vs. out-of-network 8. Utilization per each service can be modified by user and recalculated on-the-fly 9. View how cost would affect current deductible and annual maximum accumulation amounts 	
Medications (Medco)	<ul style="list-style-type: none"> 1. Search by entering drug name or use A-Z drug list; lists local pharmacy per user zip code 2. Costs defined as health plan contracted fee 3. Medication cost comparisons: 30-day retail, 90-day supply by mail 4. Lists member's out-of-pocket cost per benefits coverage 5. User can change dose and quantity supply 6. Lists the monthly and yearly out-of-pocket cost 7. Lists drug's health plan coverage status 8. Educational content including brief purpose of medication note, side effects, drug interactions and warnings 	

Findings: Treatment and Service Cost Estimator, UnitedHealthcare

Table 71.

Ease of use		UnitedHealthcare Functionality	Areas for Improvement
Content format and interpretability		<ol style="list-style-type: none"> 1. Balance of text and white space; 10-12 point font 2. Cost figures displayed side-by-side for in-network and out-of-network 3. Cost information clearly displayed in column and row format 4. Uses everyday language 5. Moderate page scrolling is effective approach to organizing information on single screen 	
Search and personalize functions		<ol style="list-style-type: none"> 1. Search function by category (e.g., skin, mental health), type down, or condition/service; organized by categories including visits, procedures, drugs, conditions, medications 2. Can personalize cost information to area by member, city/state 3. Can personalize cost information by volume of services for each type of service (e.g., number of visits, number of medications, etc.) 	<ol style="list-style-type: none"> 1. Provide simpler path to medication categories organized by condition/need (these categories are included in extensive list of individual medications) 2. Explain selection of medication(s) when presenting services for a condition or episode of care; brand-name drugs are presented
Navigation and access to reference information		<ol style="list-style-type: none"> 1. Straightforward navigation through three sections: a) find treatment, b) select treatment and c) see cost estimates 2. Left-hand navigation to benefits coverage topics and FSA tax calculator and top navigation to sections of the UHC website 3. Deductible/out-of-pocket balances and FSA/HSA balances positioned directly below the treatment cost information for immediate reference 4. Types of medical specialists that treat the condition/procedure of interest are listed adjacent to the treatment cost information – text link to the doctor directory 5. Check if treatment covered is link to user's coverage for several common medical services (e.g., office visit and urgent/emergent care) and the deductible/out-of-pocket levels 6. Link to Medco medication cost information for users of this service 	<ol style="list-style-type: none"> 1. Add link directly to condition search/list page to find explanations of the treatment/procedure/service (current link brings user to personal health page)
Miscellaneous functions: print, security, session retention		<ol style="list-style-type: none"> 1. Provides printer friendly version of the page 2. No personal identifiable information is requested/used 3. No budget functionality – no need for session retention and data export 	

Findings: Treatment and Service Cost Estimator, WebMD

Table 7J.

Decision support functions	WebMD Functionality	Areas for Improvement
Chronic condition cost estimator 	<ol style="list-style-type: none"> 1. Treatment cost estimates provided for a number of chronic conditions (e.g., asthma, arthritis, hypertension, diabetes, depression, congestive heart failure, lung disease, osteoporosis, migraines, cancers) 2. Cost presented as a normal cost range with high, average and low dollar figures 3. Summary cost followed by service counts and cost ranges by service type (e.g., office visit, test) 4. Costs in-network defined as average allowed charges using national charge database 5. Costs out-of-network defined as average billed charges using national charge database 6. Cost are <u>not</u> based on member's coverage 7. Costs per local area – user zip code 8. Cost comparison is per year for in-network vs. out-of-network 9. Can view covered benefits via link to benefits section main page but benefits are not integrated into the cost calculator 10. Primary data source is Pharmedics supplemented by Solucient outpatient procedures data 	<ol style="list-style-type: none"> 1. Integrate user's benefits coverage to provide user costs per coverage 2. Explain cost data: <ol style="list-style-type: none"> a. Data source and cost data 6-month time period lag, and b. Is "average" charges the actual average or a percentile of billed charges? 3. Explain to user when services that are less commonly provided for a condition and do not appear in the service type detail table (e.g., gastric bypass for obesity is missing)
Treatment, diagnostics and other services cost estimator 	<ol style="list-style-type: none"> 1. Treatment cost estimates provided for a number of procedures, surgeries, diagnostic tests and therapies (e.g., x-rays and scans, office visits, vaccinations, allergy shots, surgeries, labs, eye exams) 2. Cost presented as a normal cost range with high, average and low dollar figures 3. Summary cost followed by service counts and cost ranges by service type (e.g., office visit, test) 4. Costs in-network defined as average allowed charges using national charge database 5. Costs out-of-network defined as average billed charges using national charge database 6. Cost are <u>not</u> based on member's coverage 7. Costs per local area – user zip code 8. Can view covered benefits via link to benefits section main page 9. Primary data source is Pharmedics supplemented by Solucient outpatient procedures data 	<ol style="list-style-type: none"> 1. Integrate user's benefits coverage to provide user costs per coverage

Findings: Health Plan Website Assessment, WebMD

Table 7J, cont.

Decision support functions	WebMD Functionality	Areas for Improvement
Medications	 <ol style="list-style-type: none"> 1. Medication search by: a) "quick list," b) condition or c) medication full list 2. Medication cost comparisons: 30-day retail, 90-day supply and the average retail price of the drug 3. User is prompted to consider alternatives including generics and other therapeutically equivalent medications with cost comparisons in subsequent rows of table 4. Lists member's out-of-pocket cost per benefits coverage 5. Compares brand vs. generic RX out-of-pocket cost 6. Compares retail vs. mail order out-of-pocket cost 7. List preferred (formulary) vs. non-preferred status 8. User can switch between a per prescription and an annual cost comparison 	<ol style="list-style-type: none"> 1. Add cost information for over-the-counter medications

Findings: Treatment and Service Cost Estimator, WebMD

Table 7K.

Ease of use		WebMD Functionality	Areas for Improvement
Content format and interpretability	●	<ol style="list-style-type: none"> 1. Balance of text and white space; 12-point font 2. Cost figures displayed side-by-side for in-network and out-of-network – a horizontal bar range 3. Uses everyday language 4. Moderate page scrolling is effective approach to organizing information on single screen 	
Search and personalize functions	◐	<ol style="list-style-type: none"> 1. Search function by three major categories: procedures, conditions, tests 2. Drop down list of general topics as second step to narrow list of pertinent services/conditions followed by third step in which user selects a specific condition or service from scrollable list 3. Description box dynamically presents a simple explanation of the condition/service 4. Tool defaults to registered user's demographics (age, gender, zip code) to tailor the information; user has option to change defaults (e.g., family member) 	<ol style="list-style-type: none"> 1. Modify drop down list to help user easily find list of common visit types (e.g., well baby visit, annual physical, standard office visit) 2. Personalize information by severity categories and/or use of service utilization counts that user can change
Navigation and access to reference information	●	<ol style="list-style-type: none"> 1. Straightforward navigation with topic selection steps on a single page followed by results page 2. Left-hand navigation to other provider and plan comparison tools and top navigation to the sections of the WebMD website including benefits coverage, condition centers, self-care tools 3. For inpatient services a link is displayed that brings user into hospital choice tool applying the user zip code and treatment topic to retrieve relevant hospitals and the target treatment 4. Prominent link to drug comparison tool in opening section of cost estimator tool 5. Prominent link to condition-specific information for the selected topic, authored by Cleveland Clinic or explanations of treatments/services by Healthwise 	<ol style="list-style-type: none"> 1. Tell user that tool is not used to compare medication costs – the “drug compare” link is prominent but the explanation should explicitly state that medications are not compared in cost estimator
Medication features	●	<ol style="list-style-type: none"> 1. User can select aspects of medications including side-effects, indications, contraindications and drug interactions. The interactions checker compares the drugs in search with all drugs in user's personal health record on WebMD site. Frequency of side-effects are classified. 2. Straightforward navigation with medication search by: a) 'quick list' of common medications, b) condition or c) medications listed by name 3. Add a medication to user's personal health record per left-hand navigation 4. Detailed explanation of the medication through popup that opens Healthwise page for that drug 	
Miscellaneous functions: print, security, session retention	●	<ol style="list-style-type: none"> 1. Provides printer friendly version of the page 2. “Recently visit pages” function on user's WebMD personal health page display link to cost estimator results for topic that user viewed in an earlier session 	

Findings: Health Plan Website Assessment, WebMD

Table 7L.

Decision Support Techniques		WebMD Website Functionality	Areas for Improvement
Categorize service use		<ol style="list-style-type: none"> 1. User enters expected number of services for 8 medical categories (e.g., preventive care visit, office visits, hospital stay, outpatient surgery, mental health visits, emergency care) 2. User enters expected number of prescriptions for medications in personal health record or for general categories of generic, preferred brand and non-preferred brand medications 3. User can designate expected service use as in-network or out-of-network 	<ol style="list-style-type: none"> 1. Does not meet need of users who have difficulty estimating service use by categories – alternative would be to replace national average estimate defaults with several typical utilization categories for healthy and sick individuals 2. Explain the 12 medical services categories: e.g., are professional and facility services included
Calculator functions		<ol style="list-style-type: none"> 1. User enters expected service use for self and separately for “dependents” 2. User can enter expected service use or use default “national average” service use counts 3. User enters total dollar amount for expected dental and vision out-of-pocket costs 	<ol style="list-style-type: none"> 1. National average service use values are not helpful for many individuals given the large range in utilization experiences and the limits of the precision of national average estimates by category.
Insurance coverage personalization		<ol style="list-style-type: none"> 1. Costs are not based on insurer’s fee schedule/allowed charges 2. Applies user’s benefits coverage for each health plan 3. Applies user’s benefits coverage accumulation rules 4. Benefits coverage values and rules are pre-loaded; user does not have to enter 5. User can expand detail to view cost by health plan by each category (preventive care, etc.) 	<ol style="list-style-type: none"> 1. Determine costs based on health plan’s fee schedule average for a locale

Summary: Personal Account Budgeting

For this study, budgeting was defined as prospective planning capability rather than record-keeping and transactional functions, such as monitoring FSA/HSA account balances. CIGNA and WebMD met the personal account budgeting requirements to support users' FSA and HSA fund budgeting.

Personal Account Budgeting. While the evaluation determined that none of the tools is superior across all of the six performance dimensions, this is an evolving area. Only the WebMD and CIGNA tools have good prospective personal account budgeting compared to the other tools that had no planning functionality. HSA budgeting is integrated with cost estimate functions (expected number of common visit types and tests, recurrent conditions, prescription drugs, etc.). The budgeting tool presents a recommended FSA contribution given FSA maximum and expected out-of-pocket costs for each plan, as well as optimal contribution to an HSA account. The user can manipulate FSA and HSA contribution amounts to assess tax savings and the remaining costs not budgeted in a tax-preferred account.

Aetna, Blue Cross, and UnitedHealthcare do not have a prospective personal account budgeting tool. However, several of the tools have retrospective or transactional functionality in showing claims expense deductions from account balances. For these plans, the summary observations address the FSA and/or HSA calculator functions that are largely geared to accumulating transactional information.

Effectiveness of Decision-Support Technique.

The organization of services into clear categories with appropriate explanatory content is important for comparing alternatives. Clear definitions of costs, services and personal accounts are required. Distinguishing features include user-defined levels for expected use of prescriptions and medical services.

CIGNA and WebMD integrate account budgeting with the plan cost comparison tool and the user can adjust expected service use "on-the-fly" when comparing costs by plan. However, the costs can be further refined by incorporating a plan's fee schedule average on a region-specific level. While UnitedHealthcare's medical cost estimator adjusts for member's benefits coverage and contracted provider fees, and shows the

expected impact on FSA/HSA account balances, it does not have budgeting decision support.

Background

The limitations of the tools evaluated in this report reflect, in part, the ongoing challenges with advancing price transparency in the current health care environment. Some health plans and providers may view price transparency as a threat to their negotiating leverage, or erosion of their individual price position in a given market. At the same time, purchasers seek broader reporting of efficiency that incorporates both unit price and utilization, as well as relevant quality measures.

In conclusion, existing tools address some elements of the cost estimation process but have several weaknesses which limit their current utility. Future iterations of cost and budgeting tools that address these issues can go a long way towards meeting consumer needs and enhancing the role of the consumer in the health care marketplace.

Evaluation Methods

The cost estimator and budgeting decision support tools were evaluated as follows:

(1) PBGH prepared a Personal Cost Decision Support Evaluation Framework (**Appendix D**) that is comprised of criteria organized into the following evaluation categories:

- Personal Account Budgeting Functions, and
- Effectiveness of Decision Support Techniques.

(2) A consulting actuarial expert critiqued the Framework, which resulted in improvements to the cost estimator functions criteria.

(3) PBGH applied the criteria to each of the decision support tools using the following consumer vignette:

- A family is budgeting monies for a Flexible Spending Account (FSA) and a Health Savings Account (HSA) for the upcoming year given coverage under a high deductible health plan. The family has a typical array of preventive and

ongoing medical care needs along with expected dental and vision care service use.

(4) PBGH assigned grades for each decision tool using a three-tier grading method represented by the symbols below. For plans that do not offer a personal account budgeting tool, the scoring addresses the supporting elements of the FSA and/or HSA calculator. Brief descriptions highlight each tool’s capabilities vis à vis the desired dimensions.

-  **Exceeds standard** – The tool offers features beyond the primary functionality or content
-  **Meets or largely meets standard** – The primary decision support functionality and content was present
-  **Below standard** – The tool does not offer core decision support functionality or the content is too limited to meet a user’s basic needs

Figure 4.

PERSONAL ACCOUNT BUDGETING EVALUATION SUMMARY					
	Aetna	Wellpoint /BC of CA (Subimo)	CIGNA	United Healthcare / (Ingenix)	WebMD
<p>Personal Account Budgeting Does tool personalize budgeting to member’s benefits coverage and health plan contracted fees? Can user tailor expected service use? Does tool provide local average prices for dental, vision/other services? Can user allocate monies across HSA and FSA and assess tax savings?</p>	Not available	Not available		Not available	
<p>Effectiveness of Decision Support Technique Does tool organize services into a few clear categories (e.g., office visits)? Can user readily adjust expected use assumptions? Is navigation intuitive? Are topics like costs, services and personal accounts clearly defined?</p>	 *	 *		 *	

Key:  Exceeds standard  Meets or largely meets standard  Below standard

*Comments and rating reflect techniques offered in FSA and/or HSA calculator tools, as prospective budgeting function is not available.

Findings: Personal Account Budgeting, Aetna

Table 8A.

Decision Support Techniques		Aetna Health Plan Website Functionality	Areas for Improvement
Budgeting	<input type="radio"/>	<ol style="list-style-type: none"> 1. Aetna does not provide personal health account (e.g., HSA, HRA, FSA) budgeting decision support functionality 2. User can download claims history to personal computer and use data for various purposes including budgeting, records documentation for tax reporting and health plan selection 	<ol style="list-style-type: none"> 1. Add budgeting functionality to support budgeting and planning for HSA, FSA, and HRA personal accounts

Findings: Personal Account Budgeting, Blue Cross

Table 8B.

Decision Support Techniques	Blue Cross Health Plan Website Functionality	Areas for Improvement
<p>Categorize service use</p> <p>Note: Comments below address calculator tool only</p>	 <ol style="list-style-type: none"> 1. User enters age and gender and selects one of three broad health status categories for each family member 2. User selects any of 8 medical conditions including cancer or heart disease 3. User selects one of four medication use categories each of which is defined by a short list of drug/therapy categories 	<ol style="list-style-type: none"> 1. Add budgeting support for FSA
<p>Calculator functions</p>	 <ol style="list-style-type: none"> 1. Presents user with pre-calculated counts of expected services for up to 7 use categories (e.g., primary care visits, medications, inpatient stays etc.) 2. User can change the expected service use counts or accept pre-calculated values 	<ol style="list-style-type: none"> 1. Provide calculator support for dental and vision out-of-pocket costs; at a minimum provide average costs for most common dental and vision services 2. Clarify if office visits include typical diagnostic and ancillary services
<p>Insurance coverage personalization</p>	 <ol style="list-style-type: none"> 1. Cost are not based on insurer's fee schedule/allowed charges 2. User enters benefits coverage levels for each health plan that user wishes to compare (user selects plan type from pre-defined list: HSA, HRA, PPO, HMO) 3. Benefits coverage values and rules are <u>not</u> pre-loaded 4. User enters employer contribution to HRA or HSA; user contribution to HSA is automatically lowered if contribution exceeds federal HSA contribution limit 5. Itemizes estimated average cost and cost range using general cost data pooled across many payers nationwide. In-network annual costs reported for up to the 7 use categories. 	<ol style="list-style-type: none"> 1. Pre-populate the user's benefits coverage; requiring user to obtain and enter benefits coverage details (e.g., coinsurance, out-of-pocket and deductible levels, premium and personal account contributions, prescription drug cost-sharing etc.) suggests that few users will use this tool 2. Determine costs based on health plan's fee schedule average for a locale. The tool's costs though adjusted for local area allowed charges are not specific to user's health plan.
<p>Tax savings estimates</p>	 <ol style="list-style-type: none"> 1. User enters federal tax rate to obtain tax savings for HSA plan 2. User can manipulate HSA contribution amount to assess alternative contribution and tax savings amounts 3. User views total cost per plan adjusted for estimated tax savings 4. User views multi-year HSA costs 	<ol style="list-style-type: none"> 1. Add budgeting support for FSA to compare FSA tax savings with HSA tax savings and/or other scenarios
<p>Explanatory content</p>	 <ol style="list-style-type: none"> 1. Provides a summary explanation of HRA, HSA and FSA accounts – this is generic content that is not specific to user's health plan options 2. Explains general utilization assumptions for the 3 health status categories 	<ol style="list-style-type: none"> 1. Explain the HSA and HRA eligible services 2. Explain the user's benefits coverage rules including which benefits accumulate to the deductible(s) and out-of-pocket maximum(s)

Findings: Personal Account Budgeting, CIGNA

Table 8C.

Decision Support Techniques	CIGNA Health Plan Website Functionality	Areas for Improvement
<p>Categorize Service Use</p> <p>Note: Comments below address calculator tool only; See also Table 7G.</p>	<p><input type="radio"/></p> <ol style="list-style-type: none"> 1. Enter expected number of preventive care services per 5 categories (preventive care visits < age 18; visits age 18-39; visits age 40+; mammogram and pap smear) then average charges are displayed and estimated cost per service displayed 2. Enter expected number of common visit types and lab/x-ray tests 3. Enter expected counts of acute and recurrent illness from list of 14 common conditions (e.g., bronchitis, IBS, pregnancy, ulcer, allergy, migraines, etc.) 4. Enter expected counts of any of 4 chronic conditions (asthma, depression, hypertension and diabetes) 5. Enter expected counts of prescriptions choosing from among most common medications within 9 drug categories 6. Enter any miscellaneous services that are not included in the services lists, along with estimated charge and service counts 	<ol style="list-style-type: none"> 1. Clarify how a restricted FSA can be used in concert with HSA 2. Expand set of chronic conditions beyond the 4 listed
<p>Calculator functions</p>	<p><input checked="" type="radio"/></p> <ol style="list-style-type: none"> 1. Calculator presents a summary of estimated total out-of-pocket costs net of HSA contributions (adjusted for preventive costs covered under plan). 	
<p>Insurance Coverage Personalization</p>	<p><input type="radio"/></p> <ol style="list-style-type: none"> 1. Enter employer contribution amount and prior year rollover amount 2. No logic to support deductible and out-of-pocket accumulation rules for user's coverage. 3. See also FSA and HSA account budgeting section below. 	<ol style="list-style-type: none"> 1. Integrate member's benefits coverage to show medical costs estimates per coverage
<p>Tax savings estimates</p>	<p><input checked="" type="radio"/></p> <ol style="list-style-type: none"> 1. Enter expected out-of-pocket costs per the separate HSA plan cost tool 2. Enter HSA plan deductible and any employer contribution 3. Enter Federal tax bracket, FICA tax rate and State/local income tax rate (defaults) 4. The HSA annual maximum contribution is listed and user can edit contribution amount 5. Presents a tax savings estimate 6. If user plans to use a portion or all of HSA fund as a savings vehicle can calculate the interest income over a user-specified number of years 	

Findings: Personal Account Budgeting, CIGNA

Table 8C, cont.

Decision Support Techniques	CIGNA Health Plan Website Functionality	Areas for Improvement
<p>Explanatory content</p>	<p>●</p> <ol style="list-style-type: none"> 1. Presents total cost of expected services if no health insurance coverage 2. Lists summary plan benefits description (SPD) as popup content 3. Explains key coverage rules such as family-level vs. individual-level annual accumulation 4. Explains HRA and HSA balances and rollover sources 	<ol style="list-style-type: none"> 1. Explain the cost information – e.g., local area 90th percentile charges, etc. 2. Replace dental and vision explanatory information – too limited and not helpful 3. Improve explanation of uncovered medical services as it is unclear 4. Help content does not explain if diagnostic and therapeutic services are included in any of the 8 service categories – these services have a major influence on cost-sharing 5. Does not explain HSA and HRA eligible services other than in general terms
<p>FSA and HSA account budgeting (WebMD functions)</p>	<p>●</p> <ol style="list-style-type: none"> 1. HSA budgeting integrated with Web MD plan cost compare tool 2. User can enter rollover from HRA or HSA account 3. Presents employer contribution to HRA or HSA and can lower the HSA balance if user wishes to not apply all of the HSA monies to out-of-pocket costs in upcoming year 4. User can adjust expected service use on-the-fly when comparing costs by plan 5. Presents amount of HRA and HSA account balance net of expected costs 6. Presents recommended FSA contribution given FSA maximum and expected out-of-pocket costs for each plan including HSA plans and optimal contribution to HSA (e.g., consider rollover advantage of HSA) 7. Presents tax savings estimate per FSA and HSA contributions 	

Findings: Personal Account Budgeting, UnitedHealthcare

Table 8D.

Decision Support Techniques		UnitedHealthcare Functionality	Areas for Improvement
FSA/HSA calculator Note: Comments below address calculator tool only		<ol style="list-style-type: none"> 1. UnitedHealthcare does not provide personal health account (e.g., HSA, HRA, FSA) budgeting decision support functionality 2. HRA or HSA support is transactional based on listing of claims paid in prior year and amounts paid by subscriber or deducted from account (HSA setup via Exante Bank link) 	<ol style="list-style-type: none"> 1. Provide FSA and HSA budgeting functionality that includes: <ol style="list-style-type: none"> a. Average costs by locale for services such as dental exam, eyeglasses, etc. b. Amount of estimated medical claims out-of-pocket costs that could be covered in FSA or HSA
Categorize service use		<ol style="list-style-type: none"> 1. User enters estimated costs for up to 14 categories (e.g., dental exams, visit copays, orthodontia, chiropractic, etc.) to obtain a tax savings estimate 	
Calculator functions		<ol style="list-style-type: none"> 1. FSA tax calculator provides an estimate of tax savings – no functionality to support FSA budgeting 	<ol style="list-style-type: none"> 1. Add FSA budgeting functionality
Insurance coverage personalization		<ol style="list-style-type: none"> 1. Tool captures prior year claims paid and amounts paid by subscriber or deducted from account if banking provided by Exante. 	
Tax savings estimates		<ol style="list-style-type: none"> 1. FSA tax calculator provides an estimate of tax savings 	
Explanatory Content		<ol style="list-style-type: none"> 1. Easy navigation through HSA and FSA menu of text-linked eligible services 	

Findings: Personal Account Budgeting, WebMD

Table 8E.

Decision Support Techniques		WebMD Website Functionality	Areas for Improvement
<p>Categorize service use</p> <p>Note: Comments below address calculator tool only; See also Table 7L.</p>		<ol style="list-style-type: none"> 1. User enters expected number of services for 8 medical categories (e.g., preventive care visit, office visits, hospital stay, outpatient surgery, mental health visits, emergency care) 2. User enters expected number of prescriptions for medications in personal health record or for general categories of generic, preferred brand and non-preferred brand medications 	
<p>Calculator functions</p>		<ol style="list-style-type: none"> 1. User can enter rollover from HRA or HSA account 2. User can adjust expected service use on-the-fly when comparing costs by plan 3. Presents amount of HRA and HSA account balance net of expected costs 	<ol style="list-style-type: none"> 1. Provide calculator support for dental and vision out-of-pocket costs; at a minimum provide average costs for most common dental and vision services
<p>Insurance coverage personalization</p>		<ol style="list-style-type: none"> 1. Presents employer contribution to HRA or HSA and can lower the HSA balance if user wishes to not apply all of the HSA monies to out-of-pocket costs in upcoming year 2. Itemizes user costs by key components (premium deductible, coinsurance, co-pay, prescriptions, other, uncovered expenses) and personal funds applied to show total costs 	<ol style="list-style-type: none"> 1. Determine costs based on health plan's fee schedule average for a locale
<p>Tax savings estimates</p>		<ol style="list-style-type: none"> 1. User enters tax filing status and household income to obtain recommended contribution amounts for FSA and HSA accounts based on expected out-of-pocket cost for each health plan 2. User can manipulate FSA and HSA contribution amounts to assess tax savings and remaining costs not budgeted in a tax-preferred account 3. Obtain total cost per plan with potential tax savings factored in 	<ol style="list-style-type: none"> 1. Explain to user that functionality does not support the combined use of a restricted FSA in concert with a HSA so certain services could not be reimbursed under the FSA in these situations
<p>Explanatory content</p>		<ol style="list-style-type: none"> 1. Presents total cost of expected services if no health insurance coverage 2. Lists summary plan benefits description (SPD) as popup content 3. Explains key coverage rules such as family-level vs. individual-level annual accumulation 4. Explains HRA and HSA balances and rollover sources 	<ol style="list-style-type: none"> 1. Explanatory content is customizable for each client. As such, this evaluation cannot address particular requirements but the tool's stock content does not well explain items below. Customization should explain: <ol style="list-style-type: none"> a. Cost information – is it based on local area 90th percentile charges, etc.?, b. Dental and vision services for FSA budgeting, c. Uncovered medical services, d. If diagnostic and therapeutic services as these services have a major influence on cost-sharing, e. HSA and HRA eligible services beyond general terms

Appendix A – Top Commercial Conditions, Ranked by Cost

A treatment decision support tool should include decision support that addresses choices in treating the following conditions. These conditions are of high importance to many sponsors of commercial health insurance programs, given their impact on people's health, workplace productivity and on health benefit costs.

Health Problem	Ranked Highest Cost*	Prevalence Per 1,000 Employees
Heart Pain/Angina, Chronic	\$235.69	41.5
Hypertension, Chronic	\$160.23	123.8
Low Back Disorder	\$90.24	52.7
Heart Attack	\$69.23	4.1
Back Disorder, Not Low-Back	\$63.50	60.4
Bipolar Disorder, Chronic	\$64.10	18.9
Spine and Spinal Cord Trauma	\$62.16	42.3
Sinusitis	\$60.17	91.5
ENT Disorder/Mastoid	\$49.72	134.8
Osteoarthritis, Severe	\$47.04	14.6
Knee Cartilage Injury	\$36.76	10.5
Breast Cancer	\$36.09	5.0
Osteoarthritis, Chronic	\$33.94	20.8
Colon & Rectum Cancer	\$33.81	2.8
Depression	\$24.02	21.1

*Costs include medical payments, short-term disability and absence from work

Excerpted from Goetzel R, Hawkins K, Ozminkowski RJ, et al. J Occup Environ Med. 2003;45:5-14

Appendix B – PBGH Treatment Option Support Evaluation Framework

Treatment Option Support Evaluation Framework	
Treatment and Condition Information	
Treatment Support Feature	Criteria
Describe health condition	<ol style="list-style-type: none"> 1. Describe condition including symptoms, impact on function/quality of life (QOL), disease stages and spectrum of the disease 2. Describe elements of the condition that benefit from treatment (e.g., no cure but abatement of symptoms, etc.)
Describe treatment options	<ol style="list-style-type: none"> 1. List the treatment options 2. Identify crux of decision (determine if tool is a decision aid or educational resource) 3. Explain if there are alternative treatments with comparable outcomes 4. Identify <u>trade-offs of the treatments themselves</u> – side-effects, patient role, pain during treatment, etc. (regardless of whether outcomes comparable/differ) 5. Identify differences in <u>treatment results</u> – survival/recurrence, functional/other quality of life aspects 6. Explain what happens to patient without treatment/self-care (natural progression of the condition and related complications if any) 7. Identify what matters to most patients in making this decision – the high-level preferences that patients should consider like survival/recurrence, serious side-effects, patient's role, etc.
Describe treatment benefits and harms and likelihood of occurrence	<ol style="list-style-type: none"> 1. Cite probabilities of positive and negative outcomes. For conditional probabilities, frequencies (3 of 10 patients regain function if treated) are best understood and for simple probabilities, percentages (10% die) are readily understood 2. Describe treatment benefits including impact on symptoms and QOL (explain incremental benefit compared to alternatives including no therapy alternative) 3. Describe treatment harms including side-effects and impact on QOL 4. Treatment benefit/harms are explained and not just listed (e.g., higher complication rate means some patients have longer hospital stays, increased nausea, side-effects of medication therapy are x but can be mitigated with a particular supportive therapy, etc.)
Describe patient role and responsibility for each treatment option	<ol style="list-style-type: none"> 1. Describe patient's role in primary and ongoing treatment (e.g. rehabilitation, self-care, self-monitoring and other tasks) 2. Describe family/caregiver's role/burden 3. Describe duration of treatment and recovery/rehabilitation time
Present cost to patient of alternative treatments	<ol style="list-style-type: none"> 1. Present average cost <i>to the patient</i> of each treatment (explain services that are and are not included in cost estimate). If costs vary by hospital/treatment center, present and explain a cost range. 2. When relevant, explain insurance coverage conventions/exclusions (e.g., experimental treatment may not be covered).
List citations for evidence for the performance science	<ol style="list-style-type: none"> 1. Provide citations for the evidence used in presenting the treatment options (online article abstracts a plus; ensure that there is a balanced, unbiased presentation of the evidence) 2. Provide a prominent link to the authors/sponsors of the site with accompanying information that explains the process used to develop and maintain the tool's content 3. List the date of most recent review of literature pertaining to the treatment options

Treatment Option Support Evaluation Framework

Effectiveness of Decision Support Techniques

Decision Support Features	Criteria
Organize / classify / rank options	<ol style="list-style-type: none"> 1. Treatment options' performance/characteristics are organized into a small number (e.g., 3-5) of choice attributes that reflect the aspects of choice that matter to most patients 2. Treatment options' performance/characteristics are layered in a ranked hierarchy – the top-level consists of only the most important attributes; less important attributes are organized at a lower level (avoid people equally weighting attributes whose import differs considerably) 3. User can compare a treatment option's positive and negative features side-by-side 4. User can compare multiple treatment options side-by-side if reasonable options exist 5. If treatments have comparable outcomes (e.g., survival rate, symptom abatement) that is explicitly stated and user is guided to invoke preferences regarding other choice aspects including QOL, side-effects, patient role
Elicit patient preferences	<ol style="list-style-type: none"> 1. Tool identifies what matters to most patients in making the decision – the high-level preferences that patients should consider like survival/recurrence, serious side-effects, patient's role, etc. 2. User is asked to consider which aspects of the choice matter most to them (e.g., avoiding harm, realizing a benefit, etc.) 3. Preferences that are secondary to most patients are identified (as they may be important to a given patient) but subordinate to the "high-level preferences" that are of greatest importance to most patients
Provide patient testimonials/ narratives	<ol style="list-style-type: none"> 1. Tool provides patient narratives: user can consider how patients with similar condition/stage of illness have made a decision 2. A balanced set of narratives are presented – represent a range of positive and negative experiences (the proportion of positive/negative should mirror the probabilities of positive/negative results)
Personalization of information through interactive features	<ol style="list-style-type: none"> 1. Personalization is an <i>Optional Tool Feature</i>: 2. User can enter personal health information and content is tailored to: <ol style="list-style-type: none"> a. Severity or stage of condition, and b. Probabilities of treatment benefits/harms that are relevant to user's demographics 3. User can self-direct and navigate to content that fits their interests (e.g., extent of self-care, behavior change activities) 4. If tool has no personalization function, personal characteristics that may be significant to treatment choice are identified and explained (e.g., age may be an important factor given life expectancy)
Guiding user in follow-up after using tool	<ol style="list-style-type: none"> 1. Tool's purpose and role in decision process is explained (e.g., shared decision-making with treating/consulting physician, caregiver, family members, etc.) 2. Tool provides questions/issues to discuss with physician, friends and family 3. Tool provides advice regarding ways to talk about decision with physician 4. Tool provides questions to ask insurer about covered services 5. User has option to talk with a professional who is trained in the pertinent condition and in treatment choice counseling

Treatment Option Support Evaluation Framework

Ease of Use

Decision Support Features	Criteria
Content format and appearance	<ol style="list-style-type: none"> 1. Attractive page density is achieved through a balance of the amount of text, white space and moderate use of images/photos on core pages 2. Text is easy to read (minimum 12-14 point font) and is concise 3. Format (e.g., tabs, menu bars, etc.) communicates tool's organization so user can easily access topics anywhere in tool 4. Minimize page scrolling (horizontal and vertical) 5. Format includes side-by-side comparisons 6. Attributes of treatment choice are consistently sequenced in a hierarchy of importance (e.g., attributes that are important to patients and for which treatments differ are placed first/early in sequence)
Navigation and access to reference information	<ol style="list-style-type: none"> 1. Intuitive navigation w/consistent, prominent placement of navigation elements 2. If tool is nested in larger Website, the site architecture and organization enables user to instantly find & initiate decision aid and navigate from decision aid back to parent site 3. Provides a prominent link to help that has context-sensitive instructions on each page 4. Core decision support content is displayed in the primary pages and/or readily available through pop-ups
Interpretability, readability, numeracy, literacy	<ol style="list-style-type: none"> 1. Important attributes are explained in everyday language (e.g., a low complication rate means patients return home sooner, post-treatment pain diminishes quickly, costs less etc.) 2. Consistency of presentation (higher/longer is always better, no mixing of different statistics (proportions, means), same number scales for multiple charts and graphs, color cues are intuitive and show absolute (1 of 100) not relative risks, choice attributes are ordered left-to-right with most important on left side 3. Record reading level (e.g., based on SMOG or Fry reading level systems) and assess difficulty for lower-level readers 4. Provide alternatives to text to explain information (e.g., graphs, images, symbols, audio). As example, probabilities are presented in graphic and text forms 5. Performance of important attributes are classified to support interpretation (e.g., competing treatment results are better/worse, above/below average, etc.)
Miscellaneous functions print, security, session retention	<ol style="list-style-type: none"> 1. 'Print report' function to print all key information at once (e.g., create pdf) 2. Format for printing function is available to print a page completely in a readable format (e.g, black and white in 12-14 point font) 3. If personal information requested, user has option to opt-out and security safeguards are prominently communicated
Disclosure and other	<ol style="list-style-type: none"> 1. Provide evidence regarding the tool's validity and reliability – tool's performance with patients and peer review during tool development and in production 2. List the authors/providers of the information and disclose any financial arrangement that is relevant to the treatment options presented and/or declare that no such conflicts exist

Appendix C – PBGH Hospital Choice Evaluation Framework

Hospital Choice Evaluation Framework	
Information Content for Decision Support	
Hospital Decision Support Features	Criteria
Describe hospital treatment	<ol style="list-style-type: none"> 1. Describe the treatment/condition in general terms to ensure user can identify if topic is relevant to their health problem 2. Describe patient's experience – length of stay, rehabilitation/recovery period
Doctor affiliation with hospital	<ol style="list-style-type: none"> 1. Provide user with a doctor search function to determine if a particular doctor is affiliated with the relevant hospitals
Good results performance	<ol style="list-style-type: none"> 1. 30-180 day post discharge mortality indicator if relevant to treatment (Appendix B) 2. Complication summary indicator if relevant to treatment (Appendix B) 3. Limit mortality and complication indicators to small set of conditions that can be scored validly (approach mitigates conditions present at admission, co-morbidities influence, etc.) 4. Patient volume as a proxy for outcomes if relevant to treatment
Right care performance	<ol style="list-style-type: none"> 1. Evidence-based care indicator composite for treatments with endorsed measure sets (e.g., CABG, hip or knee replacement, heart failure, acute coronary syndrome)
Meet patient needs performance	<ol style="list-style-type: none"> 1. Patient experience summary indicator (recommend/rate hospital) per H-CAHPS 2. Patient experience service area-level 3 indicators (med, surg, ob) per H-CAHPS
Avoid errors performance	<ol style="list-style-type: none"> 1. Adherence to Leapfrog safe practices (27 practices) 2. Adherence to Leapfrog Intensive Care Unit staffing standard and Computer Physician Order Entry system 3. Meets/exceeded Leapfrog patient volume standards for 12 high-risk conditions 4. Performance regarding AHRQ patient safety indicators (PSI)
Affordable	<ol style="list-style-type: none"> 1. Provide user with out-of-pocket cost estimate per insurance coverage 2. Explain insurance coverage and/or preferred network status for relevant hospitals
Scope of services	<ol style="list-style-type: none"> 1. Provide number of beds count 2. Provide list of major service areas (maternity, pediatrics, day surgery, psychiatric, etc.) 3. Provide accreditation status 4. Provide medical school(s) affiliation/teaching hospital status

Hospital Choice Evaluation Framework	
Effectiveness of Decision Support Techniques	
Hospital Decision Support Features	Criteria
Describe crux of decision	<ol style="list-style-type: none"> 1. Frame the hospital decision presenting 3-5 decision attributes that matter 2. Explain if there are important differences in treatment results/other attributes among hospitals 3. Explain the morbidity/mortality risks associated with the treatment 4. Characterize range of cost differences among hospitals 5. Explain evidence on relationship of higher volume physicians/hospitals and outcomes 6. Explain relevance of any performance indicators/other attributes, which are not specific to target condition, to a condition-specific choice
Elicit patient preferences	<ol style="list-style-type: none"> 1. Top 3-5 decision attributes are customized to the treatment/condition 2. Provide "second rank" attributes for patients who want them (e.g., access via drill down) 3. Ask user to consider which aspects of the choice matter most to them – after presenting the top 3-5 attributes 4. Allow user to include/exclude or upweight/downweight attributes
Apply 'must have' criteria to create relevant list of candidate hospitals	<ol style="list-style-type: none"> 1. User can enter zip code and/or city/region to retrieve convenient list of hospitals 2. User can designate treatment/condition to retrieve hospitals that provide relevant service 3. User can limit hospital search to preferred network/coverage status 4. User can limit hospital search to their affiliated doctor's hospitals 5. User can search for specific, named hospitals
Organize and compare attributes	<ol style="list-style-type: none"> 1. Hospital performance and characteristics are organized into max 5-7 choice attributes 2. Hospital attributes are layered in a summary-to-detail and/or important to less important hierarchy and user can readily move between these levels 3. User can compare multiple hospitals' attributes side-by-side 4. User can modify default rank-priority of choice attributes
Score and classify hospitals	<ol style="list-style-type: none"> 1. Performance is summarized using maximum of 3-4 composites or roll-ups 2. Reference norm/benchmark is transparent and easily interpreted (e.g., comparison to local market vs. regional/national market is explicit) 3. Performance is reported using a consistent set of indicators (e.g., stars, numeric, etc.) 4. Format cues user on distinction between condition-specific and hospital wide performance 5. Performance categories (good/bad; high/low) are used not rankings (e.g., 1, 2, 3) 6. Provide evidence that the treatment categories are clinically homogenous (e.g., that disparate treatments are not consolidated) 7. Use techniques to minimize performance misclassification (e.g., reliability adjust small volume hospitals, case mix adjust, scoring misclassification adjust) 8. Scoring methods are transparent through links to definitions and descriptions – no black box scoring algorithm 9. Provide a "best achieved" performance result
Guide user in follow-up after using tool	<ol style="list-style-type: none"> 1. Provide user with "questions to ask" about your hospital choice and stay materials 2. Provide advice regarding ways to talk about hospital choices with physician 3. Provide questions to ask insurer about covered services 4. Provide print functions for any follow-up content

Hospital Choice Evaluation Framework

Ease of Use

Hospital Decision Support Features	Criteria
Structure	<ol style="list-style-type: none"> 1. Structure offers at least 2 major branches of decision support: <ol style="list-style-type: none"> a. Condition specific, and b. Hospital-wide/not condition specific 2. If tool is nested in larger Website, the site architecture and organization enables user to instantly find & initiate decision aid and navigate from decision aid back to parent site
Content Format and Appearance	<ol style="list-style-type: none"> 1. Attractive page density is achieved through a balance of the amount of text, white space and moderate use of images/photos on core pages 2. Text is easy to read (minimum 12-14 pt font) and concise 3. Format (e.g., tabs, menu bars, etc.) communicates tool's organization so user can easily access topics anywhere in tool 4. Minimize page scrolling (horizontal and vertical) 5. Format includes side-by-side comparisons
Navigation/access to reference information	<ol style="list-style-type: none"> 1. Intuitive navigation w/consistent, prominent placement of navigation elements 2. All core pages available from any page 3. Provides a prominent link to help that has context-sensitive instructions on each page 4. Hospital comparison pages available within 3-4 clicks of tool start page
Interpretability, readability, numeracy, literacy	<ol style="list-style-type: none"> 1. Consistency of presentation (higher/longer always is better, no mixing of different statistics (proportions, means), same number scales for multiple charts and graphs, color cues are intuitive (green go/red stop) and show absolute (1 of 100) not relative risks) 2. Topic labels clearly explain content 3. Performance symbols have evidence base (e.g., stars tested) and/or evaluable text (better, worse) used in conjunction to explain symbols 4. Maximum 8th grade reading level (e.g., based on SMOG or Fry reading level systems) 5. Performance is classified to support interpretation (e.g., competing hospital results are better/worse, above/below average, etc.) 6. Statistics (e.g., confidence intervals, odds ratios) are not used except averages or proportions
Miscellaneous functions print, security, session retention	<ol style="list-style-type: none"> 1. 'Print report' function to print all key information at once (e.g., create pdf) 2. Format for printing function is available to print a page completely, in a readable format 3. If personal information requested, user has option to opt-out and security safeguards are prominently communicated
Miscellaneous	<ol style="list-style-type: none"> 1. Provide reference documentation for scientific evidence regarding performance measures methods (measures construction, population/other adjustments, etc.) 2. Provide reference documentation for the sources of the performance data 3. List sponsor(s) who finance the provision of the tool to the user (e.g., employer, health plan, public entity, etc.) and describe the sponsor(s) financial interest in use of tool 4. List the date when specific content most recently updated

Appendix D – PBGH Personal Cost Decision Support Evaluation Framework

Personal Cost Decision Support Evaluation Framework	
Treatment and Service Cost Estimator	
Decision Support Functions	Criteria
Chronic Condition Cost Estimator	<ol style="list-style-type: none"> 1. Cost estimates provided for a number of chronic conditions 2. Costs defined per insurance product fee schedule – area average costs <ol style="list-style-type: none"> a. In-network costs are average allowed amounts b. Out-of-network defined as area average billed amounts 3. Cost are based on member's coverage (calculation formula applies benefits coverage cost-sharing and accumulation rules which are pre-loaded) 4. Costs per local area – user zip code or region 5. Cost comparison is per year 6. Costs organized into 5-10 service categories (e.g., visits, preventive care, diagnostics, etc.) 7. Utilization per each service category based on relevant population norms and/or user can enter expected units of service use 8. Utilization per each service category can be modified by user and recalculated on-the-fly
Treatment, Diagnostics, and Other Services Cost Estimator	<ol style="list-style-type: none"> 1. Cost estimates provided for a number of procedures, visit types, diagnostics and therapies 2. Costs defined per insurance product fee schedule – area average costs <ol style="list-style-type: none"> a. In-network costs are average allowed amounts b. Out-of-network defined as area average billed amounts 3. Cost are based on member's coverage (calculation formula applies benefits coverage cost-sharing and accumulation rules which are pre-loaded) 4. Costs per local area – user zip code or region 5. Cost comparison is per episode or service 6. Episodes of care (e.g., surgery) include all related professional and facility services
Medications	<ol style="list-style-type: none"> 1. Cost estimates provided for comprehensive list of medications 2. Costs defined per insurance product fee schedule – area average costs <ol style="list-style-type: none"> a. In-network costs are average allowed amounts b. Out-of-network defined as area average billed amounts 3. Cost are based on member's coverage (calculation formula applies benefits coverage cost-sharing and accumulation rules) 4. Costs per local area – user zip code or region 5. User can modify dose and quantity amounts 6. Costs are compared for 30-day and 90-day supplies 7. Annual costs are compared for retail (30-day) and mail (90-day) 8. Costs are compared for generic equivalent and over-the-counter when applicable 9. Costs are compared for preferred/formulary and non-formulary when applicable 10. Presents medication's purpose, side-effects, contraindications, interactions

Personal Cost Decision Support Evaluation Framework

Personal Account Budgeting

Decision Support Techniques	Criteria
Categorize Service Use	<ol style="list-style-type: none"> 1. Budget includes 5-10 medical service categories (e.g., visits, preventive care, medications, etc.) 2. Budget includes 5-10 dental, vision and miscellaneous service categories (e.g., exams, cleanings, visits, eye hardware, non-covered equipment) 3. Separate service category sets for user, other adult household members and for children 4. User can enter expected units of service use for each service category for each household member (all children designated as one type of household member) 5. User can revise expected units of service use and recalculate on-the-fly
Insurance Coverage Personalization	<ol style="list-style-type: none"> 1. Medical costs defined per insurance product fee schedule – area average costs <ol style="list-style-type: none"> a. In-network costs are average allowed amounts b. Out-of-network defined as area average billed amounts 2. Medical costs are based on member's coverage (calculation formula applies benefits coverage cost-sharing and accumulation rules) 3. Most common dental and vision services average area billed amounts are available 4. Costs per local area – user zip code or region 5. Budget estimates are per year 6. User enters tax filing status and household income or federal/state tax brackets 7. Provides estimated tax savings per a tax rate calculation 8. Based on member's coverage/available coverage (e.g., maximum contribution rules applied, HSA rollover amount and any employer contribution applied)
Tax Savings Estimates	<ol style="list-style-type: none"> 1. Per user's budget estimate, presents impact of funding HSA and/or FSA accounts 2. Calculates amounts that could be contributed to HSA and/or FSA per expected out-of-pocket costs
Explanatory Content	<ol style="list-style-type: none"> 1. Provides summary plan benefits description (SPD) as linked content 2. Explains key coverage rules such as family-level vs. individual-level annual accumulation 3. Explains HRA, HSA and FSA eligible services and account rules including portability, accrual, tax status, contribution limits, etc.) 4. Defines the cost data including assumptions regarding service category buildup; explains source of cost data and its time period/cost trending 5. Explains rules that are not incorporated in calculations (e.g., restricted FSA combined with HSA rules)

Personal Cost Estimator & Budgeting Tools Framework

Treatment and Service Cost Estimator

Ease of Use Functions	Criteria
Content format and interpretability	<ol style="list-style-type: none"> 1. Balance of text and white space; 10-12 point font 2. Cost figures displayed side-by-side for in-network and out-of-network 3. Cost information clearly displayed in column and row format 4. Uses everyday language 5. Moderate page scrolling to organize related information on a single screen
Search and personalize functions	<ol style="list-style-type: none"> 1. Service topic search function by: <ol style="list-style-type: none"> a. Name type down and/or A-Z name listing, category (e.g., skin, mental health), b. Condition list, and c. Type of service categories (e.g., visits, procedures, diagnostics, medications) 2. Personalize cost information by severity of condition and/or volume of services for condition 3. Personalize cost information by volume of services for each category (e.g., number of visits, number of medications, etc.) 4. Personalizes cost information by local area: zip code or region
Navigation and access to reference information	<ol style="list-style-type: none"> 1. Intuitive navigation with consistent and prominent placement of navigation elements 2. Search and data entry steps limited to several screens and then retrieve cost results 3. If tool is nested in larger website, the site architecture and organization enables user to instantly find and initiate decision aid and navigate from decision aid back to parent site 4. Provides a prominent link to reference information that has context-sensitive info for each page
Medication features	<ol style="list-style-type: none"> 1. Medication search by: <ol style="list-style-type: none"> a. Name type down and/or A-Z name listing, b. 'Quick list' of common medications, and c. Condition 2. Automatically prompt user to consider lower-cost alternative medications by displaying these alternatives when medication search results are retrieved 3. Detailed explanation of the medication, its side-effects, contraindications, etc. through linked education content
Miscellaneous functions: print, security, session retention	<ol style="list-style-type: none"> 1. Provides printer friendly version of the page 2. If personal identifiable information is requested the security safeguards and privacy policy are prominently communicated 3. User can save session information and can easily export budget data

Appendix E – Additional Resources

The following are additional resources for further understanding of consumer decision support issues and optimal design of techniques and functionality of the three types of tools evaluated in this study. Some of these individuals and organizations also provided expert review of the tools and input on the evaluation criteria.

Foundation for Informed Medical Decision Making (www.fimdm.org)

Gerteis M, Katz A, Wright D, Potter F, Rosenbach M. *Estimating the Proportion of Health-Related Websites Disclosing Information That Can Be Used to Assess Their Quality*. Cambridge, MA: Mathematica Policy Research, Inc., Document No. PR06-31a, May 2006.

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