PERSPECTIVE

The Value of Outpatient Imaging-Based Cancer Screening Episodes

Joshua M. Liao, MD, MSc^{1,2,3}, Anirban Basu, PhD⁴, and Christoph I. Lee, MD, MS^{5,6}

¹Department of Medicine, University of Washington School of Medicine, Seattle, WA, USA; ²Leonard Davis Institute of Health Economics, Wharton School, University of Pennsylvania, Philadelphia, PA, USA; ³UW Medicine Value and Systems Science Lab, Seattle, WA, USA; ⁴The Comparative Health Outcomes, Policy, and Economics (CHOICE) Institute, School of Pharmacy, University of Washington School of Medicine, Seattle, WA, USA; ⁵Department of Radiology, University of Washington School of Medicine, Seattle, WA, USA; ⁶Fred Hutchinson Cancer Research Center, Hutchinson Institute for Cancer Outcomes Research, Seattle, WA, USA.

In order to shift US health care towards greater value, the Centers for Medicare & Medicaid Services (CMS) is exploring outpatient episode-based cost measures under the new Quality Payment Program and planning a bundled payment program that will introduce the first ever outpatient episodes of care. One novel approach to capitalize on this paradigm shift and extend bundled payment policies is to engage primary care physicians and specialists by bundling outpatient imaging studies and associated procedures—central tools in disease screening and diagnosis, but also tools that are expensive and susceptible to increasing health care costs and patient harm. For example, both breast and lung cancer screening represent target areas ripe for bundled payment given high associated costs and variation in management strategies and suboptimal care coordination between responsible clinicians. Benefits to imaging-based screening episodes include stronger alignment between providers (primary care physicians, radiologists, and other clinicians), reduction in unwarranted variation, creation of appropriateness standards, and ability to overcome barriers to cancer screening adherence. Implementation considerations include safeguarding against providers inappropriately withholding care as well as ensuring that accountability and financial risk are distributed appropriately among responsible clinicians.

KEY WORDS: health policy; bundled payment; episodes of care; health care value; cancer screening

J Gen Intern Med 33(9):1571–3
DOI: 10.1007/s11606-018-4571-y
© Society of General Internal Medicine 2018

In order to shift US health care towards greater value, the Centers for Medicare & Medicaid Services (CMS) has implemented episode-based bundled payment programs for a wide range of surgical procedures, medical conditions, and oncology treatments¹. However, questions remain about how and where to best use bundled payment.

Recently, CMS canceled or revised several hospital-focused bundled payment initiatives and subsequently announced Bundled Payments for Care Improvement Advanced (BPCI Advanced), a forthcoming program that introduces outpatient episodes of care for the first time ever beginning with several cardiac and musculoskeletal procedures². Simultaneously, under the new Quality Payment Program, CMS is exploring outpatient “episode-based cost measures” to hold providers including primary care physicians accountable for costs of multiple episodes of care¹.

One novel approach to capitalize on this paradigm shift towards outpatient episodes of care is to extend policies such as BPCI Advanced and engage primary care physicians and specialists in bundling outpatient imaging studies and procedures. Although they are central tools in disease screening and diagnosis, imaging tests are expensive and susceptible to increasing health care costs (e.g., through additional follow-up imaging or intervention) and patient harm (e.g., radiation exposure, complications arising from follow-up interventions). In response to these concerns and disproportionate growth in imaging costs, policymakers have pursued multiple approaches—legislation, national campaigns, and private radiology utilization management groups—to target imaging as a driver of low-value care³.

While these measures may be helpful, progress has been slow. Here, we use the examples of imaging-based breast and lung cancer screening episodes to describe how bundling certain imaging tests and associated downstream care can accelerate progress and improve value.

THE NEED TO IMPROVE THE VALUE OF OUTPATIENT IMAGING-BASED CANCER SCREENING

Diagnostic workup for false-positive findings on screening mammography alone accounts for an estimated \$1 billion in annual costs to Medicare⁴. Much of these screening-associated costs may represent waste, in part driven by variation in radiologist interpretations and individual thresholds for recommending diagnostic workup. Up to 10% of breast cancer screening exams lead to further diagnostic evaluation, and disagreement about management after diagnostic mammography can occur in up to 25% of cases⁵. Despite use of

Received January 23, 2018
Revised May 30, 2018
Accepted July 2, 2018
Published online July 18, 2018

standardized reporting systems, debate remains about the appropriateness of current thresholds for recommending invasive breast biopsies. This dynamic is compounded by the multiple ways in which primary care providers, radiologists, and patients communicate about screening exam findings and recommendations.

Similarly, outpatient lung cancer screening represents another target area ripe for bundled payment. Despite evidence that screening with low-dose computed tomography (LDCT) can produce benefit, widespread screening would add up to \$2 billion in health care expenditures annually while raising a number of potential harms⁶. For example, LDCT not infrequently identifies small, non-specific lung nodules that are often benign, but subsequent interventions (e.g., surgical biopsy) and related complications cause considerable harm⁷. The optimal approaches for avoiding inappropriate radiation exposure and ensuring communication between providers and with patients also remain unestablished.

RATIONALE FOR OUTPATIENT IMAGING-BASED CANCER SCREENING EPISODES

Coordination between primary care and other physicians participating in cancer screening remains far from perfect. Traditionally, there have not been systematic processes to encourage primary care physicians who order screening mammograms to coordinate screening-related care with interpreting radiologists who make management recommendations and perform subsequent diagnostic evaluations. A similar dynamic often exists between primary care physicians, radiologists, and other clinicians involved in lung cancer screening.

Imaging-based episodes could provide an explicit way to align clinicians by providing appropriate financial (e.g., opportunity to earn savings and avoid penalties) and non-financial (e.g., data sharing, provider feedback) incentives. For instance, episodes could combine established primary care breast cancer screening adherence metrics with performance metrics for radiologists such as those that encourage lower recall rates (i.e., frequency with which radiologists interpret screening exams as positive and recommend additional imaging) while preserving cancer detection rates. Such approaches could help reduce the significant, and potentially wasteful, costs related to initial screening mammography.

A natural extension would be to standardize care along the imaging-based cancer screening and diagnostic continuum. For example, recognizing the importance of shared decision-making and the potential harms posed by lung cancer screening-related procedures, Medicare requires clinicians to engage patients using shared decision-making tools prior to LDCT screening⁸. However, no analogous policies govern downstream screening-related care (e.g., no appropriateness criteria or thresholds for lung biopsies or surgical intervention). Similarly, shared decision-making tools are sparsely used in breast cancer screening care⁹, particularly among

women 40–49 years of age for whom screening decisions should involve national recommendations but ultimately follow individual preferences and values. Thresholds for pursuing breast biopsy are also largely subjective and based on individual radiologist ability and risk tolerance¹⁰. Episodes of care provide a promising vehicle for improving the patient-centeredness of communication and avoiding cost and potentially harmful diagnostic procedures.

Imaging-based breast and lung cancer screening episodes could provide a way to move beyond piecemeal solutions and reduce waste by clearly defining episode content (e.g., incorporating smoking cessation into lung cancer screening) and scope (e.g., beginning with shared decision-making visits rather than with screening tests). As observed for other clinical episodes,^{11, 12} bundled payments could also encourage providers to reduce unwarranted variation and develop standardized approaches to diagnostic imaging recommendations and interventions. Finally, bundles could potentially help overcome certain barriers to cancer screening. Because diagnostic imaging studies are not always covered by payers under fee-for-service arrangements, bundling screening and downstream diagnostic tests could help remove financial barriers and improve adherence.

IMPLEMENTATION CONSIDERATIONS

Although bundled payment can curb overuse of costly low-value services, it must also safeguard against providers inappropriately withholding necessary care. In existing programs, CMS has addressed this issue by risk-adjusting certain episodes (e.g., joint replacement cases arising from hip fracture), allowing higher spending targets for patients who experience complications, and requiring that providers meet minimum quality standards to earn savings.

Analogously, outpatient imaging-based cancer screening episodes could incorporate quality metric requirements (i.e., benchmarks for recall rates from screening) and different spending targets based on patient risk¹³. Existing cancer screening registries are widely used to collect performance and outcome metrics for breast and lung cancer screening and can serve as tools for monitoring quality and mitigating the risk of patient harms under imaging-based cancer screening episodes.

In particular, episodes must account for patients at intermediate to high risk for breast or lung cancer. While inclusion of higher risk Medicare patients may not substantially influence bundle prices¹⁴, this may not be true for younger patients with genetic predispositions or family history of early cancer. Compared to average-risk patients, these individuals may be more likely to have positive screening findings and require more intensive surveillance or diagnostic workup. In turn, the appropriateness of post-screening evaluation may be more difficult to determine, and episode duration and spending targets

should accommodate the additional services necessitated by higher risk profiles.

Another consideration relates to how accountability and financial risk are distributed among responsible clinicians. Such arrangements can vary in structure¹⁵ but are likely to be the strongest when all providers—primary care physicians, radiologists, and subspecialty providers—share responsibility and risk. In turn, this reality underscores the need for organizational leaders and involved providers to align behind shared understanding of episode costs, agreement about how costs are attributed to providers, and use of deliberate frameworks to align internal incentives within an organization¹⁶.

CONCLUSION

To continue shifting US health care towards value, clinicians and policymakers are expanding bundled payment into the outpatient setting. As exemplified by breast and lung cancer screening, imaging-based episodes of care have the potential to capitalize on this paradigm shift and reduce waste, control costs, and increase care coordination across multidisciplinary primary care and subspecialty teams.

Corresponding Author: Joshua M. Liao, MD, MSc; Department of Medicine, University of Washington School of Medicine, Seattle, WA, USA (e-mail: joshliao@uw.edu).

COMPLIANCE WITH ETHICAL STANDARDS:

Conflict of Interest: Dr. Liao declares that he does not have a conflict of interest. Dr. Basu declares consultancies and Dr. Lee declares grants, textbook royalties and stock options, none of which have a relationship to this work.

REFERENCES

- Centers for Medicare & Medicaid Services. Quality Payment Program. Available at: <https://qualitypaymentprogram.cms.gov/>. Accessed on May 16, 2018.
- Centers for Medicare & Medicaid Services. BPCI Advanced. Available at: <https://innovation.cms.gov/initiatives/bpci-advanced/>.
- Durand DJ, Lewin JS, Berkowitz SA. Medical-Imaging Stewardship in the Accountable Care Era. *N Engl J Med*. 2015; 373: 1691–1693.
- Elmore JG, Gross CP. The cost of breast cancer screening in the United States: a picture is worth...a billion dollars? *Ann Intern Med*. 2014;160(3):203.
- Elmore JG, Wells CK, Lee CH, Howard DH, Feinstein AR. Variability in Radiologists' Interpretations of Mammograms. *N Engl J Med*. 1994; 331:1493–1499.
- Goulart BH, Bensink ME, Mummy DG, Ramsey SD. Lung cancer screening with low-dose computed tomography: costs, national expenditures, and cost effectiveness. *J Natl Comr Can Netw*. 2012; 10(2): 267–275.
- Bach PB, Mirkin JN, Oliver TK, et al. Benefits and Harms of CT Screening for Lung Cancer: A Systematic Review. *JAMA*. 2013; 307(22): 2418–2429.
- Centers for Medicare & Medicaid Services. Decision Memo for Screening for Lung cancer with Low Dose Computed Tomography. Available at: <https://www.cms.gov/medicare-coverage-database/details/nca-decision-memo.aspx?NCAId=274>. Accessed on May 16, 2018.
- Keating NL, Pace LE. Breast cancer screening in 2018: time for shared decision making. *JAMA* 2018; 319(17):1814–1815.
- Flowers CI, O'Donoghue C, Moore D, et al. Reducing false-positive biopsies: a pilot study to reduce benign biopsy rates for BI-RADS 4A/B assessments through testing risk stratification and new thresholds for intervention. *Breast Cancer Res Treat* 2013; 139(3):769–777.
- Liao JM, Emanuel EJ, Whittington GL, Small DS, Troxel AB, Zhu J, Zhong W, Navathe AS. Physician Practice Variation Under Orthopedic Bundled Payment. *Am J Manag Care*. 2018. (forthcoming).
- Liao JM, Hodlofski A, Whittington G, et al. Baptist Health System: Succeeding in Bundled Payments through Behavioral Principles. *Healthcare (Amst)*. 2017; 5(3):136–140.
- Lehman CD, Arao RF, Sprague BL, et al. National Performance Benchmarks for Modern Screening Digital Mammography: Update from the Breast Cancer Surveillance Consortium. *Radiology*. 2017; 283(1):59–69.
- Hughes DR, Jiang M, McGinty G, Shetty, SK, Duszak, R. An empirical framework for breast screening bundled payments. *J Am Coll Radiol*. 2017; 14:17–23.
- Frameworks for Radiology Practice Participation. Harvey L. Neiman Health Policy Institute. Available at: <http://www.neimanhpi.org/ice-t/frameworks-for-radiology-practice-participation/>. Accessed on May 16, 2018.
- Powers BW, Navathe AS, Chaguturu SK, Ferris TG, Torchiana DF. Aligning incentives for value: The internal performance framework at Partners HealthCare. *Healthcare (Amst)*. 2017; 5(3): 141–149.