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**1.** Russell MA. Low-tar medium-nicotine cigarettes: a new approach to safer smoking. Br Med J 1976;1:1430-3.
**2.** Benowitz NL, Henningfield JE. Establishing a nicotine threshold for addiction: the implications for tobacco regulation. N Engl J Med 1994;331:123-5.
**3.** Henningfield JE, Benowitz NL, Slade J, Houston TP, Davis RM, Deitchman SD. Reducing the addictiveness of cigarettes. Tob Control 1998;7:281-93.
**4.** Benowitz NL, Nardone N, Dains KM, et al. Effect of reducing the nicotine content of cigarettes on cigarette smoking behavior and tobacco smoke toxicant exposure: 2-year follow up. Addiction 2015 July 21 (Epub ahead of print).
**5.** Zeller M. Reflections on the 'endgame' for tobacco control. Tob Control 2013;22: Suppl 1:i40-i41.

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# Mandatory Medicare Bundled Payment — Is It Ready for Prime Time?

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In July, the Centers for Medicare and Medicaid Services (CMS) issued a proposed rule for a new Comprehensive Care for Joint Replacement (CCJR) program. The program would establish bundled payments for total hip and knee replacements, covering hospitalizations, professional fees, and all clinically related Medicare Part A and Part B services for 90 days after discharge, including skilled nursing facility care, home care, and hospital readmissions. CCJR is similar to another model CMS is testing called Bundled Payments for Care Improvement (BPCI), but whereas BPCI is voluntary, hospitals would be required to participate in CCJR. CMS proposes implementing the 5-year program in 75 metropolitan statistical areas with approximately 750 hospitals beginning January 1, 2016.

Bundled payment creates financial incentives for providers to coordinate care over the full continuum of services and eliminate spending that doesn't benefit patients. Avenues for potential savings include reducing errors and complications during inpatient stays, adopting more effective purchasing practices for surgical implants,[1] and managing post-acute care more efficiently. The Institute of Medicine concluded that variation in post-acute care spending is the single largest factor behind geographic variation in Medicare spending per beneficiary,[2] and substantial savings may be achievable by directing patients to more cost-effective settings — home care rather than institutional care when appropriate, and higher-quality, more efficient facilities when institutional care is required.[3] But bundled payment is complex to administer, and many professionals worry about its effect on their livelihood.

CCJR is CMS's first proposed mandatory bundled-payment program extending across multiple providers and settings. Such a proposal was probably inevitable, given the new goal of shifting 30% of Medicare spending to alternative payment models by the end of 2016.[4] Bundled payment appeals to policymakers because it can cover a much wider spectrum of providers than models such as the Pioneer ACO, in which organizations need a large base of primary care physicians and strong capital reserves to participate effectively. Moreover, CCJR would require that participants accept a 2% discount on their bundle prices, guaranteeing Medicare savings that would be scorable by the Congressional Budget Office. But is mandatory bundled payment ready for prime time?

In 2013, more than 400,000 Medicare beneficiaries received hip or knee replacements at a cost of more than $7 billion for hospital stays alone. The initial hospitalization accounts for only about 55% of total episode costs; Medicare also spends about $6 billion during the 90-day post-acute period. Medicare spends about $26,000, on average, per joint-replacement episode, but the wage-adjusted average ranges from $16,500 to $33,000 among the 196 metropolitan areas considered for the demonstration. Joint-replacement surgeries are elective, relatively standardized, and subject to relatively low spending variation — factors that make them a good starting point for testing mandatory bundled payment.

The CCJR program would include medical severity diagnosis–related groups (MS-DRGs) 469 and 470; both DRGs include hip and knee replacements, but DRG 469 is for patients with major complications or coexisting conditions, and its average cost is about twice that of DRG 470. CMS would calculate episode target prices for each MS-DRG and each hospital separately on the basis

of 3 years of historical data. No adjustments would be made for patient-specific characteristics such as coexisting conditions, because CMS found no suitably reliable risk-adjustment approach.[5] Episode prices do not include indirect medical education or disproportionate share hospital payments, which would be paid separately.

The proposal includes several controversial components beyond mandatory participation. First, hospitals would be exclusively responsible for the bundled-payment program and would control any financial surpluses, which may concern physicians and post-acute care providers who fear being cut out of the action. New clinical alliances are likely, however, because hospitals will perform better if they have collaborative relationships with these providers, and gainsharing with partners will be authorized. Second, whereas BPCI episode prices are determined primarily by each hospital's historical spending, CCJR prices would be calculated using a blend of hospital-specific and regional spending. Initially, one third of the price would be based on regional averages, but fully regional pricing would be used by year 5 — benefiting low-cost providers but presenting challenges for providers with high complication rates, excess use of post-acute care, or sicker-than-average patients. CMS proposes regional prices based on the nine census regions, which will create added pressure to curtail spending in higher cost markets.

CCJR is a retrospective payment model: CMS would set annual target prices for each hospital but continue paying providers through a fee-for-service system. At the end of each year, CMS would reconcile payments with spending targets. If total payments for a hospital's joint-replacement episodes were below the target, it would be paid the savings — if it met quality thresholds. Target prices would be updated annually on the basis of regular Medicare payment-system updates for hospitals, physicians, and post-acute care providers. Participants would thus know their target prices before each year began, unlike BPCI participants, who are informed of recalculated target prices quarterly, after each quarter ends.

The chief technical challenge of bundled payment is mitigating the random variation in average spending per episode that results from patient heterogeneity combined with small case volumes. Joint replacement is the most common Medicare DRG, but hospitals that performed these procedures in 2013 did a median of about 90 of them. Whereas Medicare pays about $26,000 on average for a 90-day joint-replacement episode, it spends $125,000 or more for the most expensive 1% of DRG 469 episodes and about $75,000 for the most expensive 1% of DRG 470 episodes. A few outliers can have a big effect. For example, if a hospital with 90 cases had no outliers one year and two $100,000 cases the next, its average episode cost would increase by 6%.

CMS proposes several mechanisms to mitigate this problem. First, it would truncate individual episode spending at the 95th percentile — roughly $103,000 for DRG 469 and $53,000 for DRG 470 — in calculating target prices and performance-period spending. Next, it would cap each hospital's annual gains and losses. Gains would be limited to 20% of each hospital's target spending for all 5 years. Hospitals would have no downside risk in 2016; then losses would be capped at 10% of total spending in years 2 and 3 and 20% thereafter. Despite these limits, some hospitals could lose or gain a lot of money. Taking post-acute spending into account, a 20% gain or loss per 90-day episode would amount to roughly 35 to 40% of hospitals' inpatient DRG payment for joint replacement. Much lower stop-loss limits are proposed for rural, sole community, and Medicare-dependent hospitals.

Another new element in CCJR is that hospitals would be financially accountable for quality. CMS proposes three quality measures: 30-day all-cause risk-standardized readmission rates, risk-standardized complication rates, and patient-experience scores on the Hospital Consumer Assessment of Healthcare Providers and Systems. Hospitals would have to score above the 30th percentile nationally on all measures in order to keep the savings they generate. Although quality incentives are essential for bundled payment, I believe CMS should revise this formula, because about half of CCJR hospitals will fail to meet at least one of the three thresholds and will be ineligible for savings awards.

CCJR is more straightforward and transparent than BPCI and provides similar financial opportunities with less initial downside risk. But without risk adjustment, some hospitals will question the mandate to participate unless CMS offers additional financial protection. Given the random-variation problem, CMS could consider lower stop-loss limits for hospitals with fewer than 40 or 50 annual episodes and for safety-net providers.

CCJR is the type of bold experiment that's needed to advance payment reform, and I believe it will be ready for prime time with some technical changes. Much can be learned from it, but because it focuses on a high-volume, relatively standardized elective procedure with moderate cost variation, the results may not be generalizable across Medicare. Designing workable bundled-payment models for patients with conditions with greater clinical heterogeneity and lower patient volumes will be challenging. CMS will need to work closely with the medical community to refine episode-payment methods, develop effective risk-adjustment tools, and design new experiments that are coherent, transparent, and supportive of providers that want to deliver better care at a lower cost.

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**1.** Wilson NA, Schneller ES, Montgomery K, Bozic KJ. Hip and knee implants: current trends and policy considerations. Health Aff (Millwood) 2008;27:1587-98.
**2.** Newhouse JP, Garber AM. Geographic variation in Medicare services. N Engl J Med 2013;368:1465-8.
**3.** Mechanic RE. Post-acute care — the next frontier for controlling Medicare spending. N Engl J Med 2014;370:692-4.
**4.** Burwell SM. Setting value-based payment goals — HHS efforts to improve U.S. health care. N Engl J Med 2015;372:897-9.
**5.** Centers for Medicare and Medicaid Services. Medicare Program: Comprehensive Care for Joint Replacement payment model for acute care hospitals furnishing lower extremity joint replacement services. Federal Register. July 14, 2015 (https://www.federalregister.gov/articles/2015/07/14/2015-17190/medicare-program-comprehensive-care-for-joint-replacement-payment-model-for-acute-care-hospitals).

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