HEALTH CARE COST INSTITUTE

Focusing on Seven Services Could Eliminate More Than Two-Thirds of Low-Value Care in HCCI's ESI Data

Issue Brief

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There is substantial evidence that people in the U.S. receive health care services judged to be of low-value. These services are identified as low value based on recommendations from the U.S. Preventive Services Task Force (USPSTF) and professional medical societies that there is little to no clinical value associated with their provision and potential for harm in specific clinical scenarios. One example of a low-value service is inappropriate prescribing of opioids in cases where the benefits are uncertain and the potential for misuse is high. Another example of a low-value service are screenings (e.g., prostate-specific antigen tests to screen for prostate cancer in men 70 years of age and older) that are unlikely to inform treatment or management of a disease, but that could surface findings that lead to unnecessary further testing, health care services, and costs. Low-value services may expose patients to financial and emotional costs as well as adverse health outcomes and lead to inefficiency in the health care system.

Existing work on the use of and spending on low-value care focuses on Medicare enrollees, individual health systems, or selected states, with limited national-level data on people who get health insurance through an employer. Since more people in the U.S. get insurance through an employer than any other source, any strategy to reduce low-value care should be informed by data on the provision of these services among this population. We examined the use of and spending on low-value care in 2019 (prior to the COVID-19 pandemic) using the Health Care Cost Institute's (HCCI's) dataset of health care claims from over one-third of individuals with employer-sponsored insurance (ESI).

To identify low-value care, we used the Milliman Health Waste Calculator, which measures provision of and spending on 58 services determined to be low-value based on clinical evidence and guidelines. Using claims data, the Waste Calculator identifies whether a service was "likely low-value" or "low-value" depending on the person's clinical and demographic characteristics, since a given service may be low-value for some patients but not for others.

Just seven low-value services of the 58 we examined were responsible for almost 70% of all low-value service use and spending. These services included several screening tests, routine general health checks for asymptomatic patients, inappropriate opioid prescribing, and two types of preoperative tests that have been identified as low value. The concentration of low-value care spending and use in our data suggests that policymakers, payers, and employers could substantially reduce low-value care among people with ESI by focusing on a small set of measures.

18% of People in HCCI's Data Received a Low-Value Service in 2019

In 2019, 18% of people with ESI in HCCI's data received at least one low-value service identified by the Health Waste Calculator. Very few enrollees received more than one of the 58 services.

Total spending on low-value services in our data was 2.6% of total health spending across all services, translating to about $100 for each person enrolled. Patients shouldered nearly 20% of these costs in the form of out-of-pocket spending.

We did not find meaningful variation in use of or spending on low-value services by age, sex, or health plan type (e.g., HMO vs. PPO), or by varying levels of social vulnerability as measured by the CDC's Minority Health Social Vulnerability Index. Use of and spending on low-value services by sub-population are available in the downloadable data accompanying this report.

Low-Value Care was Highly Concentrated Among 10 Services with Highest Use and Spending

To examine which services accounted for most low-value care, we identified the 10 most commonly provided low-value services (**Figure 1**) and the 10 low-value services with the highest associated spending (**Figure 2**) in our data.

The most commonly used low-value service in our data in 2019 was inappropriate opioid prescription for non-cancer chronic pain, which represented nearly one-quarter (23%) of all low-value care. Prescribing opioids for people with non-cancer chronic pain is associated with a greater likelihood of developing opioid use disorder, and deviates from clinical guidelines to treat these conditions with non-pharmacologic therapy and non-opioid medications as a first step.

Other high-volume, low-value services in our data were cardiac screens (e.g., electrocardiograms) for asymptomatic patients, which made up 16% of low-value care use, and antibiotics for upper respiratory and ear infections, which made up 12% of low-value care use (**Figure 1**).

Providers typically perform cardiac screens with the goal of assessing coronary heart disease risk, however there is no evidence that these screening tests are effective in predicting the onset of heart disease. Instead, they often lead to overdiagnosis and can prompt unnecessary spending and potential harms from follow-up tests. Antibiotics are often prescribed for upper respiratory (URI) and ear infections; however, evidence suggests that because most URIs and ear infections are caused by viruses, antibiotics (which only work on bacterial infections) are ineffective at treating the underling illness. These prescriptions impose clinical risks such as long-term resistance towards the medication, as well as financial costs.
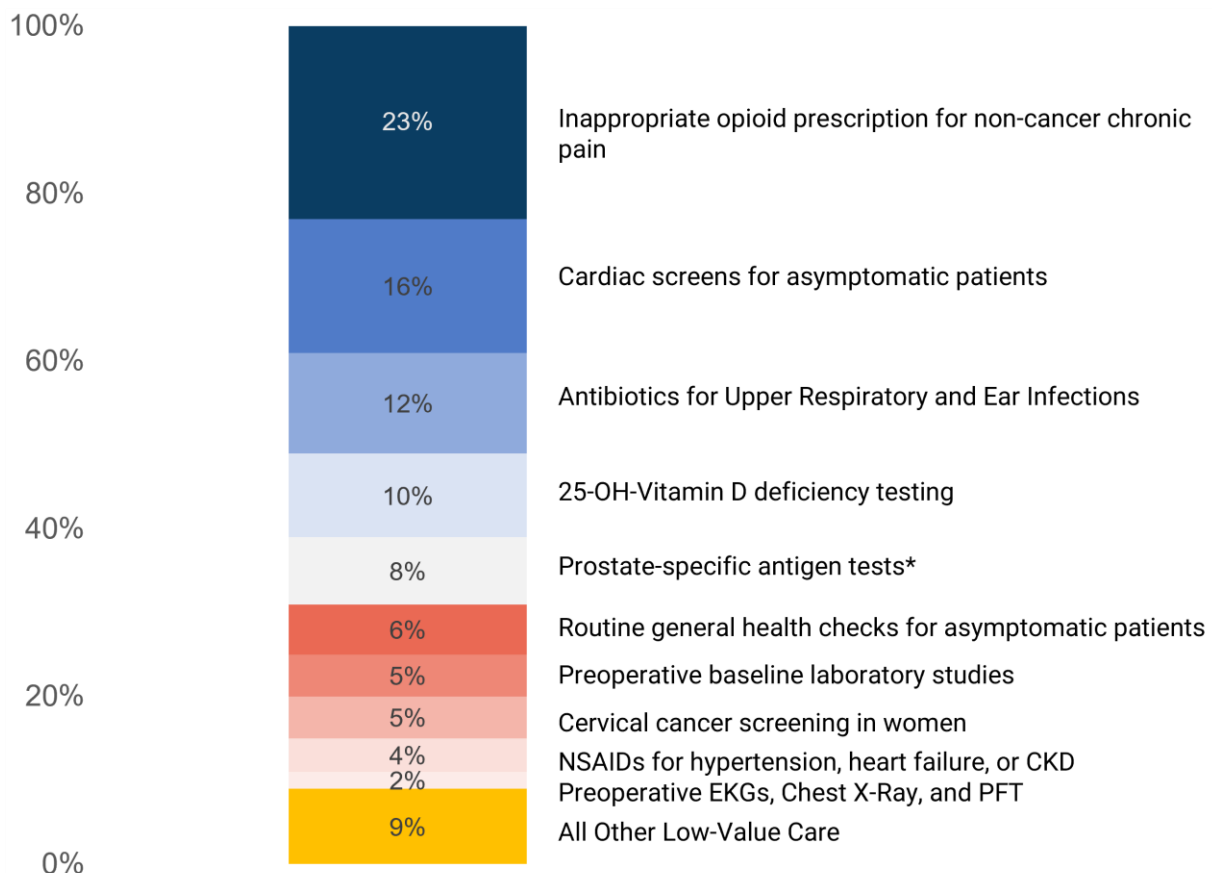
In addition to making up 16% of low-value service use, cardiac screens for asymptomatic patients accounted for 23% of all spending on low-value services in our data, making it the low-value service associated with the highest spending (**Figure 2**). Another 20% of low-value service spending was concentrated in baseline lab

tests (e.g., bloodwork) done for patients prior to low-risk surgeries, which have been shown to have little clinical value for such patients but can lead to false-positive or borderline results that require further investigation and can delay surgery.

Taken together, the 10 most frequently used services made up more than 90% of all low-value service use and the 10 services with the highest spending made up more than 75% of all spending on low-value services. Seven measures were both frequently provided and costly. Identifying these services can help payers, providers, and policymakers target efforts to reduce low-value care and associated costs.

Figure 1. 10 Most Commonly Provided Low-Value Services in HCCI's Data in 2019

23%	Inappropriate opioid prescription for non-cancer chronic pain
16%	Cardiac screens for asymptomatic patients
12%	Antibiotics for Upper Respiratory and Ear Infections
10%	25-OH-Vitamin D deficiency testing
8%	Prostate-specific antigen tests*
6%	Routine general health checks for asymptomatic patients
5%	Preoperative baseline laboratory studies
5%	Cervical cancer screening in women
4%	NSAIDs for hypertension, heart failure, or CKD
2%	Preoperative EKGs, Chest X-Ray, and PFT
9%	All Other Low-Value Care

*The Milliman Waste Calculator does not apply age-based restrictions to the prostate-specific antigen (PSA) testing guideline. Therefore, all PSA testing, regardless of age, is counted as "low-value," aligning with a C-rating from the USPSTF. As of May 8, 2018, a USPSTF D-rating only includes men 70 years of age and older.

Figure 2. 10 Low-Value Services in HCCI's 2019 Data Associated with the Highest Spending
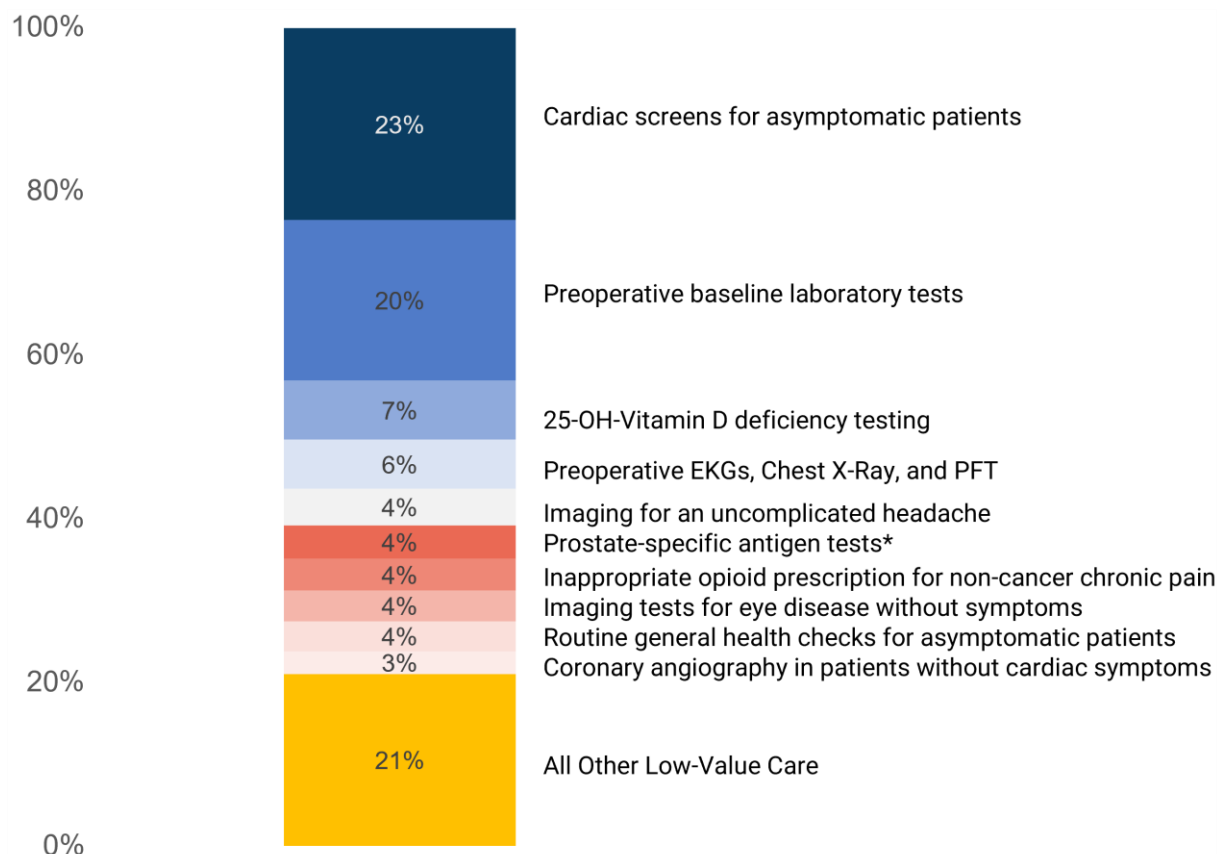
* The Milliman Waste Calculator does not apply age-based restrictions to the prostate-specific antigen (PSA) testing guideline. Therefore, all PSA testing, regardless of age, is counted as "low-value," aligning with a C-rating from the USPSTF. As of May 8, 2018, a USPSTF D-rating only includes men 70 years of age and older.

Focusing on Seven Measures, Associated with High Use and High Spending, Could Address Two-Thirds of Low-Value Care

As shown in **Figure 3**, the following seven low-value services were among the most commonly used and associated with highest spending:

- Cardiac screens for asymptomatic patients

- Vitamin D deficiency testing among low and average risk patients

- Prostate-specific antigen (PSA) screening*

- General health checks for asymptomatic patients

- Preoperative baseline laboratory testing (e.g., bloodwork)

- Preoperative cardiac screenings (e.g., chest x-ray)

- Inappropriate opioid prescription for any non-cancer chronic pain

* The Milliman Waste Calculator does not apply age-based restrictions to the prostate-specific antigen screening (PSA) testing guideline. Therefore, all PSA testing, regardless of age, is counted as "low-value," aligning with a C-rating from the USPSTF. As of May 8, 2018, a USPSTF D-rating only includes men 70 years of age and older.
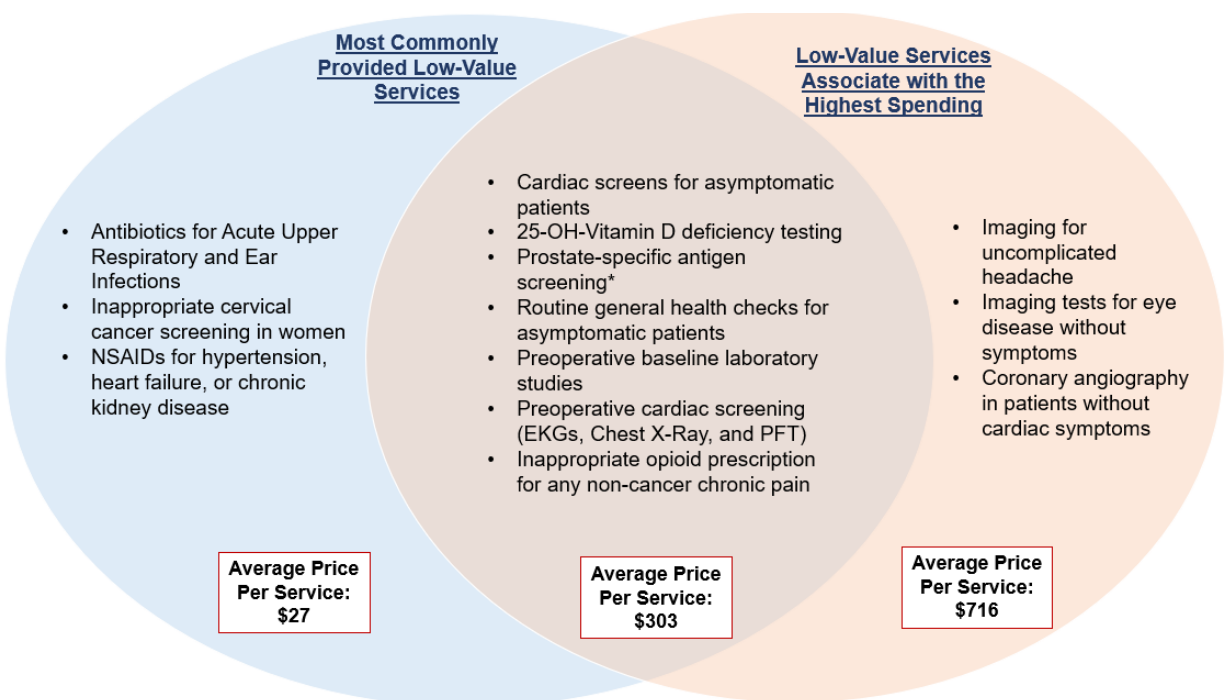
Together, these seven services represented 70% of low-value care use and 68% of low-value care spending, suggesting that reducing the provision of these services may be the most efficient way to mitigate the impacts of low-value care.

Vitamin D deficiency testing, prostate cancer screening, and cardiac imaging for asymptomatic patients, all considered low-value screening tests, made up 34% of low-value use and 35% of spending associated with low-value services in our data in 2019.

The two preoperative evaluation measures, including lab tests and imaging (e.g., chest x-rays) prior to a low-risk surgery for patients who are otherwise healthy, made up 7% of use and 26% of spending.

Inappropriate opioid prescription for non-cancer chronic pain was the most commonly used low-value service, making up 23% of low-value services, and associated with 4% of spending in HCCI's 2019 data. Finally, routine general health checks made up 4% of low-value service use and 6% of spending on low-value services.

Figure 3. Seven Low-Value Services Were Both High Volume and High Spending

Most Commonly Provided Low-Value Services

Low-Value Services Associate with the Highest Spending

- Antibiotics for Acute Upper Respiratory and Ear Infections
- Inappropriate cervical cancer screening in women
- NSAIDs for hypertension, heart failure, or chronic kidney disease

- Cardiac screens for asymptomatic patients
- 25-OH-Vitamin D deficiency testing
- Prostate-specific antigen screening*
- Routine general health checks for asymptomatic patients
- Preoperative baseline laboratory studies
- Preoperative cardiac screening (EKGs, Chest X-Ray, and PFT)
- Inappropriate opioid prescription for any non-cancer chronic pain

- Imaging for uncomplicated headache
- Imaging tests for eye disease without symptoms
- Coronary angiography in patients without cardiac symptoms

Average Price Per Service: $27

Average Price Per Service: $303

Average Price Per Service: $716

* The Milliman Waste Calculator does not apply age-based restrictions to the prostate-specific antigen (PSA) testing guideline. Therefore, all PSA testing, regardless of age, is counted as "low-value," aligning with a C-rating from the USPSTF. As of May 8, 2018, a USPSTF D-rating only includes men 70 years of age and older.

Services with high use but not high spending (shown in the blue circle) affected the greatest number of patients but were relatively low in cost, on average. These three measures combined accounted for one-fifth of low-value care use, but the average price per service ($27) was relatively low. This suggests that, although these services were quite common,

reducing their provision may not generate a meaningful reduction in spending.

Measures with high spending but not high use (shown in the orange circle) were expensive on a per service basis, but less commonly provided. Three measures fell in this group, including imaging services for an uncomplicated headache and eye disease without symptoms, and coronary angiography in asymptomatic patients. These three measures made up 11% of spending on low-value care and were costly

on a per service basis — over $700 per service on average — but were used less frequently than high-use services.

The average price per service among the seven common and high-spending services (shown by the overlap between the blue and orange circles) was more than $300. Because these are relatively expensive services, reducing their provision can curb a considerable amount of low-value care in the U.S. health care system as well as the amount spent on such services.

Focusing on a Small Number of Measures Could Significantly Reduce Low-Value Care in ESI

Payers and providers could substantially reduce low-value care by targeting a small set of measures that are commonly provided and associated with relatively high spending. According to our data, focusing on reducing the provision of just seven services, including several screening tests, routine general health checks for asymptomatic patients, inappropriate opioid prescribing, and two types of preoperative tests that have been identified as low-value would eliminate about 70% of low-value use and spending. (Note that use reported in this report reflects use in 2019; patterns of use of some services may have changed since due to factors associated with the pandemic, coverage, preferences, or changes in guidelines.)

Nearly 20% of individuals who get insurance through an employer received a low-value service, as identified by the Health Waste Calculator, in HCCI's 2019 data. The provision of these services occurs in a

broad swath of the ESI population, as almost no patients received more than one low-value service. This may suggest that the receipt of low-value care is more driven by systemic issues tied to hospital and physician incentives to increase volume of care and hard-to-change practice patterns and norms, rather than patient demand. As such, low-value care has presented an intractable problem for the health care system, with no quick fix. Despite efforts to identify and reduce use of low-value services at the levels of professional societies, health systems, and states, people continue to receive these services.

Our data suggest that by targeting the small number of measures that are frequently used, associated with high spending, and of low-value according to clinical evidence, policymakers have the potential to reduce harms to patients and alleviate financial costs associated with low-value care.

Low-Value Services in the Milliman Waste Calculator

Measure	Source for Low-Value Determination
Cardiac screens for asymptomatic patients	Choosing Wisely
25-OH-Vitamin D deficiency	Choosing Wisely
Prostate-specific antigen testing	USPSTF
Routine general health checks for asymptomatic patients	Choosing Wisely
Preoperative baseline laboratory studies	Choosing Wisely
Preoperative cardiac screening (EKGs, Chest X-Ray, and PFT)	Choosing Wisely
Inappropriate opioid prescription for and non-cancer chronic pain	Choosing Wisely
Pediatric head CT scans	Choosing Wisely
Inappropriate cervical cancer screening in women	Choosing Wisely
NSAIDs for hypertension, heart failure, or chronic kidney disease	Choosing Wisely
Imaging for uncomplicated headache	Choosing Wisely
Imaging tests for eye disease without symptoms	Choosing Wisely
Coronary angiography in patients without cardiac symptoms	Choosing Wisely
Colorectal cancer screening in adults 50 years and older	USPSTF
Imaging for low back pain within first six weeks	Choosing Wisely
Dual-Energy X-Ray Absorptiometry Screening for osteoporosis in women younger than 65 or men younger than 70 with no risk factors	Choosing Wisely
Brain imaging studies (CT or MRI) in the evaluation of simple syncope and a normal neurological examination	Choosing Wisely
Immunoglobulin G (IgG) testing or an indiscriminate battery of immunoglobulin E (IgE) tests in the evaluation of an allergy	Choosing Wisely
Routine diagnostic testing in patients with chronic urticaria	Choosing Wisely
Electroencephalography (EEG) for headaches	Choosing Wisely
Antibiotics for adenoviral conjunctivitis (pink eye)	Choosing Wisely
CT scan of the head/brain for sudden hearing loss	Choosing Wisely
Routine radiographic imaging for uncomplicated acute rhinosinusitis	Choosing Wisely
Coronary artery calcium scoring for patients with known coronary artery disease (including stents and bypass grafts)	Choosing Wisely
Head CT scans for emergency room visits for severe dizziness	Other Source
Elective, non-medically indicated inductions of labor or cesarean deliveries before 39 weeks, 0 days gestational age	Choosing Wisely
Oral antibiotics for uncomplicated acute tympanostomy tube otorrhea (TTO)	Choosing Wisely
Cough and cold medicines for respiratory illnesses in children under four years of age	Choosing Wisely
Magnetic Resonance Imaging (MRI) of peripheral joints for Rheumatoid Arthritis	Choosing Wisely
Arthroscopic knee surgery for knee osteoarthritis	Other Source
Antidepressants as monotherapy in patients with Bipolar I disorder	Other Source
Baseline diagnostic cardiac testing or cardiac stress testing in asymptomatic stable patients with known cardiac disease undergoing low or moderate risk non-cardiac surgery	Choosing Wisely

Advanced sperm function testing (e.g., sperm penetration or hemizona assays) in the initial evaluation of infertility	Choosing Wisely
Postcoital test (PCT) for the evaluation of infertility	Choosing Wisely
Repeat CT scans of the abdomen and pelvis in young, otherwise healthy emergency department patients under age 50 with known histories of kidney stones or ureterolithiasis, presenting with symptoms consistent with uncomplicated renal colic	Choosing Wisely
CT scans in the evaluation of abdominal pain in children	Choosing Wisely
Revascularization without prior medical management for renal artery stenosis	Other Source
Vertebroplasty for osteoporotic vertebral fractures	Other Source
Peripherally inserted central catheters (PICC) in stage III-V chronic kidney disease patients without consulting nephrology	Choosing Wisely
More than a single fraction of palliative radiation for an uncomplicated painful bone metastasis	Choosing Wisely
Stress cardiac imaging or advanced non-invasive imaging in the initial evaluation of patients without cardiac symptoms unless high-risk markers are present	Choosing Wisely
Oral antibiotics for members with upper respiratory infections or ear infections	Choosing Wisely
Bleeding time testing for any patient care	Choosing Wisely
Pulmonary function testing (PFT) prior to cardiac surgery in the absence of respiratory symptoms	Choosing Wisely
Two or more antipsychotic medications concurrently	Choosing Wisely
Vision therapy for patients with dyslexia	Choosing Wisely
Proton beam therapy for prostate cancer outside of a prospective clinical trial or registry	Choosing Wisely
Intensity modulated radiotherapy (IMRT) to deliver whole breast radiotherapy as part of breast conservation therapy	Choosing Wisely
Total or free T3 levels when assessing levothyroxine (T4) dose of hypothyroid patients	Choosing Wisely
Oral antibiotics for treatment of atopic dermatitis unless there is clinical evidence of infection	Choosing Wisely
PTH measurement for patients with stage 1-3 chronic kidney disease	Other Source
Carotid endarterectomy in asymptomatic patients or for patients without a history of stroke or TIA and without focal neurological symptoms noted in claim	Other Source
X-ray for diagnosis of plantar fasciitis/heel pain in patients who stand or walk at work	Choosing Wisely
Arthroscopic partial meniscectomy for degenerative meniscal tear in middle aged patients without symptoms of knee pain	Other Source
Free testosterone testing for hypogonadism or hyperandrogenism diagnosis	Choosing Wisely
Testing for uncomplicated cellulitis	Other Source
Electroencephalography (EEG) for headaches	Choosing Wisely
Imaging of carotid arteries for simple syncope without other neurological symptoms	Choosing Wisely
Voiding Cystourethrogram in first febrile urinary tract infection (UTI) in children aged 2-24 months	Choosing Wisely

Methods

The [Milliman Health Waste Calculator](#) measures the provision of and spending on 58 services determined to be low-value based on clinical evidence and guidelines. Using health care claims data, the Waste Calculator identifies whether a service was "likely low-value" or "low-value" depending on the person's clinical and demographic characteristics, since a given service or test may be low-value for some patients but not for others. Milliman selects measures based on amenability to claims data analysis, high prevalence, high-cost impact, and potential to cover a variety of subspecialties and patient populations.

To run the Milliman Waste Calculator on HCCI's dataset, we included 2019 inpatient, outpatient, professional, and pharmacy claims for members who were enrolled in an employer-sponsored insurance plan for at least one month in the year. We excluded any members with multiple values of geographic residence (e.g., Core-Based Statistical Area), sex, or plan type in a given month. All claims with less than $1 in allowed amounts were removed. We also included all 2018 claims for these members. Therefore, the maximum lookback period to obtain historical health care use and clinical diagnoses was 12 months.

In this analysis, total and out-of-pocket spending were calculated using a "case rate" methodology. The Milliman Health Waste Calculator includes two methodologies for counting wasteful spending: (1) the "case rate" and (2) the "line itemization." In this report, we have only included estimates associated with the "case rate" method. The case rate counts all related services occurring alongside the "trigger event" (i.e., the service directly considered low value). In contrast, the line method only counts the costs from the trigger event itself, and likely underestimates wasteful spending. For example, the trigger event for the "lower back pain image" measure is Magnetic Resonance Imaging (MRI). The line itemization only counts spending associated with the MRI itself, while the case rate includes other services provided in pursuit of a diagnosis (e.g., an x-ray or physician office visit) that may also be considered wasteful.

Acknowledgements