

Introduction

Much of the focus of past health reforms in Minnesota and nationally has been about better access to health care services. These efforts were about developing strategies to bring health insurance coverage to those unable to afford it and reducing financial barriers using health care services. Together, these strategies aimed to help people access needed preventive and curative health care services that otherwise might not be within reach.

In addition to considering challenges of *underuse* of health care services associated with lack of access to care, policy debates over the past few years have increasingly begun to address the problem of *overuse*, or the use of unnecessary, or low-value care. While these discussions often focused on the role of low-value or unnecessary care in contributing to higher health care costs, low-value care is also an important patient safety issue, given the potential harm associated with unnecessary care.

Under one definition, low-value services are medical procedures that have been shown to “provide little benefit and in some cases have the potential to cause harm”¹ to a particular population of patients. After years of hard work by medical societies and consumer groups, there are now more than 450 recognized guidelines for reducing low-value care.

This issue brief presents the first-ever look at a selection of low-value services in Minnesota. While there are hundreds of services that are widely considered to be low-value, we are focusing here on 18 services that primarily fall into two specific and actionable areas of low-value care – diagnostic imaging and disease screening – in the hope that this can spark further initiatives to lower the use of these services and inspire follow-up research into other low-value services in Minnesota.

The research in this issue brief relies on the availability of the Minnesota All Payer Claims Database (MN APCD), a comprehensive state repository of health care transactions for Minnesota patients derived from the billing records of medical providers.²



Key Findings

- In 2014, there were about 92,000 encounters associated with low-value diagnostic imaging, 69,000 encounters with low-value disease screening, and 15,000 encounters with low-value pre-operative testing.
- Total spending on all 18 low-value services measured was \$54.9 million.
- Minnesotans spent \$9.3 million out-of-pocket for these services.
- Diagnostic imaging for uncomplicated headaches was the most common and most costly low-value service observed, accounting for 40% of overall cost.

¹ American Board of Internal Medicine. *Choosing Wisely* – Lists. Retrieved from www.choosingwisely.org/doctor-patient-lists

² More on the Minnesota All Payer Claims Database: www.health.state.mn.us/data/apcd

Background

Measuring and reducing low-value care is a goal shared by providers, payers, and policy makers as they focus on greater value in health care. It is part of a broader recognition that reducing overall health care costs will require addressing the estimated 30 percent of costs associated with waste in the system (including overuse, underuse, errors and inefficiencies).³

But consumers too, motivated by an interest in receiving care that avoids unnecessary harm *and* expense, play an important role in decreasing the frequency of low-value care.

While there is broad agreement about the need to deliver care more efficiently and effectively, it has been more difficult to come to consensus on how to define, measure, and reduce low-value care.

The American Board of Internal Medicine's *Choosing Wisely* campaign is a leading voice in defining and identifying low-value services, with the goal to help patients and physicians choose care that is:⁴

- Supported by evidence;
- Not duplicative of other procedures;
- Free from harm; and
- Truly necessary.

Choosing Wisely has sparked a broad conversation about value in health care by working with medical societies and consumer groups to identify procedures or services that do not fit the criteria above. Academic researchers, quality measurement organizations and health care accreditation bodies have further contributed to this work.

Our analysis applied 18 existing and publicly tested claims-based measures of low-value services^{5,6,7} to the MN

APCD. These services were identified as low-value by the *Choosing Wisely* campaign, U.S. Preventive Services Task Force (USPSTF), or the U.K.'s National Institute for Clinical Excellence. The measure definitions were selected from peer-reviewed scientific journals and a Washington State report that measured low-value care in that state's voluntary APCD. Researchers and clinicians from Mayo Clinic in Rochester, Minnesota, assisted us in identifying the service types to investigate and provided valuable clinical expertise in interpreting the results of the analysis.

The results included in this issue brief are presented in two categories: diagnostic imaging and disease screening. These are broad descriptions and the low-value services within each category relate to a diverse set of patients and clinical circumstances. *Choosing Wisely* includes many more recommendations for screening and imaging because of their high frequency and broad applicability.

The data presented here represent low-value services delivered in an outpatient setting to insured Minnesotans during 2014. The majority of the observed services occurred in outpatient clinics, but services delivered in hospital outpatient departments, ambulatory surgical centers, and emergency departments (EDs)⁸ are included as well.⁹

In all steps of this analysis, we took a conservative approach to defining low-value services, erring on the side of not identifying care as low-value. Thus, the utilization and costs are best interpreted as plausible *lower bound* estimates. There may be some instances where providing the service was the appropriate clinical choice given the patient's specific situation. However, these instances should be rare.

Additional technical details, including variable specification, are available online in a technical supplement.¹⁰

³ Berwick DM and AD Hackbarth, "Eliminating Waste in US Health Care," JAMA 307; 14, 2012.

⁴ www.choosingwisely.org/about-us

⁵ Schwartz AL, Landon BE, Elshaug AG, Chernew ME, and McWilliams J, "Measuring Low-value Care in Medicare," JAMA Internal Medicine 174; 7, July 2014.

⁶ Segal JB, Bridges JFP, Chang H, et al., "Identifying Possible Indicators of Systemic Overuse of Health Care Procedures with Claims Data," Medical Care 52; 2, February 2014.

⁷ Washington State Choosing Wisely Task Force, "Less Waste. Less Harm. Choosing Wisely in Washington State," Washington Health Alliance, September 2014. <http://wahealthalliance.org/wp-content/uploads/2014/09/Choosing-Wisely-in-Washington-state.pdf>

⁸ ED care was excluded for some measures – see Technical Supplement available online: www.health.state.mn.us/data/apcd/publications.html

⁹ Health care services delivered in inpatient settings, to uninsured Minnesotans, or through the VA, Indian Health, and military health systems are not included in this analysis.

¹⁰ www.health.state.mn.us/data/apcd/publications.html

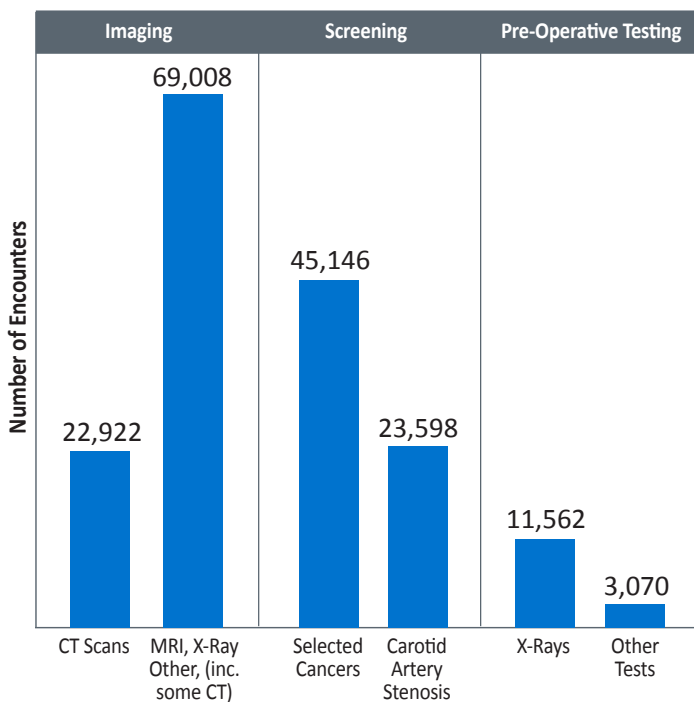
Overall Results

In 2014, there were 92,000 instances in which Minnesotans received diagnostic imaging — computed tomography (CT) scans, X-rays or magnetic resonance imaging (MRI) — for services or in circumstances where they are widely considered of low diagnostic value (see Figure 1). This included, for instance, imaging for low back pain without a prior history of trauma or neurologic impairment, or for uncomplicated headaches.

Minnesotans were unnecessarily screened for certain cancers or carotid artery stenosis¹¹ about 69,000 times in 2014 (see Figure 1). Prostate-specific antigen (PSA) screening among men age 75 and older and cervical cancer screening among women age 65 and older accounted for most of the low-value cancer screening tests we studied.

Figure 1: Frequency of Selected Low-Value Services in Minnesota, 2014

Total Encounters: 175,306



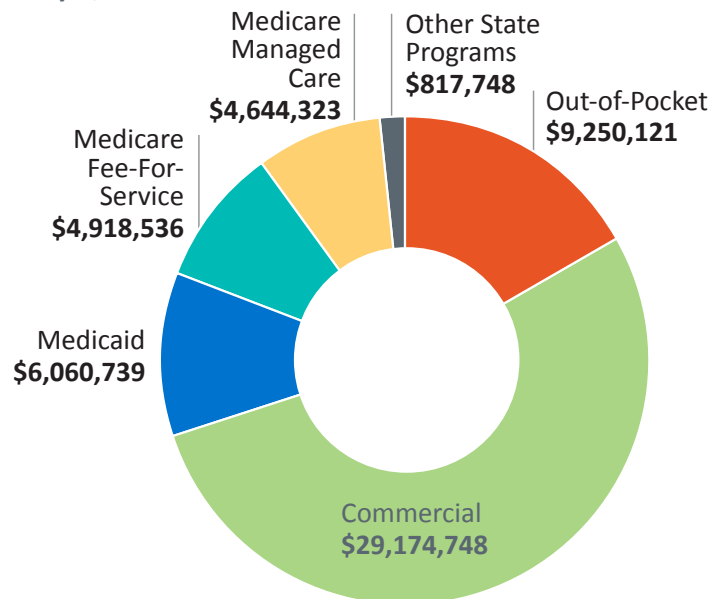
SOURCE: MDH/Health Economics Program analysis of data from the MN APCD, March 2017

In addition to low-value diagnostic imaging and disease screening, we measured the frequency of three low-value tests performed prior to low-risk surgeries. It can be important to assess a patient's health before a surgical procedure to ensure that complications will not cause serious harm, but recommendations by the American Society of Thoracic Surgeons and American College of Surgeons suggest that the three pre-operative tests we studied do not provide information that is likely to alter a patient's treatment plan. We identified about 15,000 instances of low-value pre-operative tests in 2014, most of which were chest x-rays.

The 18 low-value services analyzed for this issue brief were delivered relatively infrequently in Minnesota (see additional detail below). Still, they accounted for a substantial investment of health care resources in 2014. In total, payers spent about \$54.9 million on the 18 low-value services and procedures studied for this issue brief.

Although much of the research to date about low-value services has been about Medicare patients, Figure 2 shows that commercial payers accounted for two thirds (\$29.1 million) of observed spending on the measured services. Medicare was the second highest payer, accounting for 21 percent of total spending (\$10.7 million), roughly evenly split between managed care and traditional fee-for-service plans.

Figure 2: Total Spending on Select Low-Value Services by Payer, 2014



SOURCE: MDH/Health Economics Program analysis of data from the MN APCD, March 2017

¹¹ A narrowing of the blood vessels in the neck

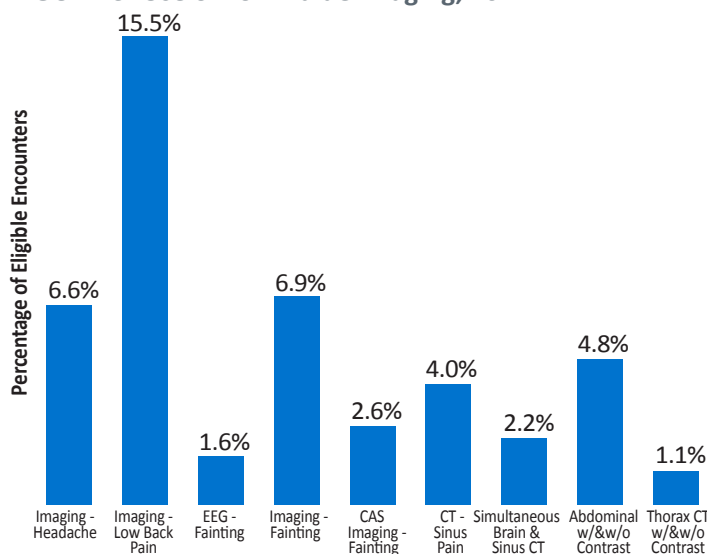
Note: A detailed list of total spending on low-value services by payer for each of the 18 low-value services can be found in the [Technical Specifications and Methods Supplement](#).

Minnesotans assumed a sizable share of the burden directly, by paying out of pocket for these services through health insurance deductibles and other cost-sharing. In 2014, direct spending by Minnesota residents accounted for 16.9 percent of the cost of these services, or \$9.3 million. Individuals with commercial health plans incurred most (81 percent) of these out-of-pocket costs. The following sections focus on low-value diagnostic imaging and screening. More information about low-value pre-operative tests is available in Appendix Table 3.

Detailed Results: Low-value Imaging

Health care providers use diagnostic imaging to help identify the underlying condition that is causing a patient’s symptoms. Some common diagnostic imaging services include X-rays, CT scans, and MRI. A diagnostic imaging service may be of low value if the information provided by imaging does not substantively assist the clinician in diagnosis. For instance, performing CT or MRI imaging on patients experiencing fainting has not been shown to effectively detect the underlying cause of symptoms.¹² Alternatively, imaging might not be valuable if it is unlikely to provide information that will change the course of treatment.¹³ For example, The American College of Radiology says that using imaging for headache patients who do not have specific risk factors for structural disease is not likely to change the course of treatment or management.¹⁴

FIGURE 3: Use of Low-Value Imaging, 2014



SOURCE: MDH/Health Economics Program analysis of data from the MN APCD, March 2017

Figure 3 shows the utilization for nine categories of low-value imaging. The results presented here indicate how often imaging was performed as a percentage of the total number of outpatient encounters¹⁵ fitting the diagnostic criteria and restrictions. The relatively low utilization observed indicates providers do not often use imaging to diagnose the cause of common symptoms like headache, back pain, and fainting.

As Figure 3¹⁶ shows, more than 15 percent of patients received low back imaging when they presented to an outpatient provider with a new complaint of low back pain. Patients with chronic low back pain are not included in this measure – imaging may be more appropriate for these patients if other evaluation and management strategies have not sufficiently addressed the problem.

Some types of low-value imaging present avoidable health risks to patients. X-rays and CT scans expose patients to low doses of ionizing radiation. While safe in small amounts, the cumulative effect of radiation exposure over a patient’s life leads to increased risk for some cancers.¹⁷ Ambiguous results from diagnostic imaging may result in other low-value services that place the patient at risk for adverse health events and cause stress and anxiety for patients. While the benefits of diagnostic imaging can outweigh the health risks, the low-value research community recommends avoiding unnecessary or unwarranted exposures.

Health plans, consumers, and state/federal agencies paid over \$2.7 million for low-value imaging for low back pain, with commercial insurance accounting for 82 percent of this spending. These costs were borne primarily by the third-party payers discussed above, but Minnesotans experienced over \$1 million in out-of-pocket costs for these procedures. Though this is a very small percentage of overall out-of-pocket spending in 2014, it does highlight the financial cost of low-value services to consumers at the point of service. These figures do not include the indirect costs associated with potentially avoidable follow-up testing or image interpretation services and are a conservative estimate of the total cost of low-value imaging for low back pain.

Diagnostic imaging for simple headache was the costliest low-value imaging service measured in this analysis. CT scans

¹² www.choosingwisely.org/clinician-lists/american-college-physicians-brain-imaging-to-evaluate-simple-syncop

¹³ Detailed information about the source of the measure, the population it applies to and how it is calculated is available in a Technical Supplement to this issue brief. It is available online: www.health.state.mn.us/data/apcd/publications.html

¹⁴ www.choosingwisely.org/clinician-lists/american-college-radiology-imaging-for-uncomplicated-headache

¹⁵ An encounter is defined as all claims for a single person on a single date of service. An encounter may include multiple providers/service settings, in which case it counts as 1 in the numerator and denominator of the utilization percentage

¹⁶ We omitted one measure from this display to improve readability of the visual. Details about CT for Appendicitis without prior ultrasound are available in Appendix Table 1.

¹⁷ U.S. Food and Drug Administration: www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/MedicalImaging/MedicalX-Rays/ucm115329.htm

and MRIs for headaches cost more than \$22 million in 2014. Minnesotans spent nearly \$4 million out-of-pocket for these imaging services. The American College of Radiology finds that less costly and invasive procedures like discussion of medical history or a neurological exam offer better diagnostic power and do not expose the patient to radiation.

Detailed Results: Low-Value Screening

Low-value screening services are tests for cancer or other diseases that clinical experts have determined are unlikely to benefit patients. Screening tests are generally applied to a population that is considered higher risk for disease or for whom early detection significantly improves life expectancy or treatment effectiveness.

Screening tests are imperfect and may sometimes incorrectly identify a patient as having a disease or fail to catch some cases of disease. The probability of the test making an error increases for populations where the disease is very uncommon. A screening test may also be of low value if early detection does not offer significant benefits to the patient.

Low-value screening does not carry as many direct risks for patients as low-value imaging, but the mental anxiety of a false positive result, as well as the ensuing tests and procedures, may produce adverse events or poor outcomes for patients. They also result in additional financial costs on the system and for patients. Patients may, for example, have to return for additional appointments to interpret tests or obtain follow-up services.

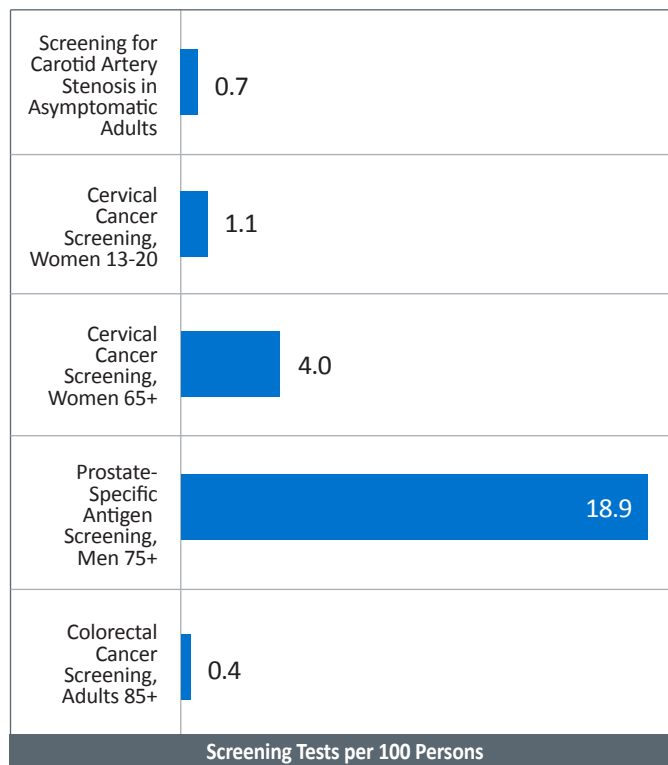
Our analysis of low-value screening measured the frequency and cost of four cancer screens and two screens for carotid artery stenosis. The cancer screen measures rely on guidelines developed by USPSTF for routine screening procedures. Four screens that receive a grade of 'D,' meaning 'not recommended,' are:

- Cervical cancer screening for women 13-20;¹⁸
- Cervical cancer screening for women 65+;¹⁹
- Colorectal cancer screening for adults 85+;²⁰ and
- Prostate specific antigen (PSA) tests for prostate cancer in men 75+.²¹

The screening use results in Figure 4 suggest that the level of low-value cervical cancer screening was very low in 2014. One out of every 100 Minnesota females between 13 and 20 received cervical cancer screening; the rate for older women (65+) – another measure of interest – was four in every 100.

The rate of low-value prostate cancer screening was significantly higher. Nearly 20 percent of Minnesota men age 75 and older received low-value PSA screens in 2014. This was the most common low-value screening observed in the data with over 24,000 unique instances.

FIGURE 4: Use of Low-Value Screening, 2014



SOURCE: MDH/Health Economics Program analysis of data from the MN APCD, March 2017

The direct unit costs of low-value screening are more modest than for low-value imaging because they are generally less technologically intensive. The total cost for the 69,000 screening procedures in 2014 was about \$12.2 million, accounting for 22.3 percent of spending for all 18 conditions. As noted, these estimates do not account for follow-up tests or other procedures that resulted from ambiguous screening results.

¹⁸ USPSTF Cervical Cancer Screening Recommendations: 2012

¹⁹ Ibid.

²⁰ USPSTF Colorectal Cancer Screening Recommendations: 2016

²¹ USPSTF Prostate Cancer Screening Recommendations: 2012



By including public and private insurance claims for nearly all Minnesotans, the MN APCD offers a unique opportunity to compile a more complete picture of the burden of low-value care in the state. The results presented in this brief report the frequency and cost of a selection of compelling measures of over- and/or misuse. The estimates demonstrate:

- How often Minnesotans received one of these 18 low-value services;
- The direct costs of delivering these services; and
- Who bore the costs of these services.

These estimates are a new contribution to understanding the best ways to promote high-value care in the state. Health systems and providers can use these estimates of low-value service utilization as an external benchmark for their own quality improvement work.

Employers and patient advocates, including through the partnership between the *Choosing Wisely* campaign and Consumer Reports, already provide information to patients to help them ask key questions and understand the risks and benefits of imaging and screening (as well as other services). State-level data can help identify opportunities for progress and celebrate relative success and improvement.

Commercial payers, who bear the majority of the cost of the 18 low-value services analyzed in this study, can use these data to aid in developing incentive structures for providers and patients to discourage the use of low-value services. In partnership with others, insurers can also play a pivotal role in helping equip their enrollees to talk to their care team about the type and value of care they are receiving.

Providers and payers have already begun reforming delivery systems to improve value, including by reducing use of services that do not contribute to better health or may expose patients to harm, and reforming payment mechanisms to reward value rather than volume of care. Evidence suggests that these reforms have been slow to effect substantial change²². Reducing low-value services is a multi-faceted endeavor that will take collaboration across stakeholders to bring about a culture change for providers and patients. It is possible that for some lower-cost services, the investment required to prevent them might be greater

Conclusion

Choosing Wisely and other initiatives concerning themselves with reducing low-value services have highlighted the opportunity for patients, providers, and payers to work together to improve the efficiency and safety of the U.S. healthcare system. Changes to provider reimbursement and patient cost sharing have increased the focus on value-based care. As part of a broader strategy focusing on eliminating unnecessary care and waste, reducing low-value services could play an important role in making progress toward these goals.

Activities to reduce low-value services in Minnesota have been limited by the lack of comprehensive information on the problem of low-value care. Research by provider and payer groups can typically only capture the dimensions of the problem affecting the populations they serve. National-level research is unable to accurately reflect Minnesota's patient, provider, and payer characteristics, which makes state and local policy-setting and benchmarking challenging.

²² Hong AS, Ross-Degnan D, Zhang F, and Wharam JF, "Small Decline in Low-Value Back Imaging Associated With The 'Choosing Wisely' Campaign, 2012–14." *Health Affairs* 36; 4, April 2017.

than the cost of the low-value service. Still, opportunities to make progress include:

- Shifting economic incentives so that low-value services generate costs, rather than revenue for providers;
- Helping patients to understand the risks and benefits of certain services and to move away from the perception that more care is always better;
- Better equipping providers and patients to have productive conversations rooted in mutual respect and understanding, in which the patient is an active part of the care team;
- Improving continuity of care and information sharing so that patients and providers can make more informed decisions when considering diagnostic imaging and screening; and
- Developing technology-driven tools, including through EHR-based, real-time clinical decision supports, to aid providers in their decision-making.

By some measure, the volume of low-value services for Minnesota and the attributable health care spending reported here may appear small. It is important to remember, however, that the set of measures studied here accounts for just a small subset of the 400-plus services identified on various credible lists of low-value services.²³ To the extent that some of these lists of low-value services may have identified “easy wins” and do not include major procedures that are substantial, revenue-generating services for providers,²⁴ as some observers have suggested, the potential impact of a reduction in low-value services could be even larger.

Finally, as noted earlier, any estimate of the full impact of low-value services must include not only the downstream medical costs related to follow-up care that stems from these services, but also their indirect impact on premium growth. Beyond health system costs, these services also result in time away from work, home or family — and, in some cases, additional health risks related to exposure to radiation or infection — that patients bear as they interact unnecessarily with the health care system.²⁵

While there is a need for additional research, including to ensure that appropriate clinical nuance is considered in the specification of measures of low-value services, these findings emphasize the imperative for health care organizations to reduce low-value services. Stakeholders must work together to identify practices that are not necessary to inform or improve care and/or have the potential to create harm, measure and incentivize practices that demonstrate high benefit, empower patients to be active participants in their care, and improve efficiency while reducing waste.²⁶

This research will be most successful if it can serve as a seed to grow future conversations and collaborations. MDH is eager to contribute to this by working with stakeholders, including Minnesota’s health providers, payers, and policy makers to identify measurement, analyses and delivery reforms that can aid in the process to achieve such a high-value, patient-centered system of care.

²³ Elshaug AG, McWilliams JM, and Landon BE, “The Value of Low-Value Lists,” JAMA 309; 8, February 2013.

²⁴ Morden NE, Colla CH, Sequist TD, and Rosenthal MB, “Choosing Wisely – The Politics and Economics of Labeling Low-Value Services,” NEJM 307; 7, February 2014.

²⁵ Some estimates place these costs at about \$43 for a single office visit that involves 20 minutes with a physician and more than 90 minutes travel time and interacting with non-physician staff. Ray KN, Chari AV, Engberg J, et al., “Opportunity Costs of Ambulatory Medical Care in the United States,” Am Journal of Managed Care 21; 8, August 2015.

²⁶ See Elshaug AG, et al., 2013.



For further information about the MN APCD:

Online: www.health.state.mn.us/data/apcd/index.html

Email: health.apcd@state.mn.us



Appendix Table 1: Low-Value Imaging Measures, 2014

	Measure	Numerator	Denominator	Rate (% of Encounters)	Total Cost
1	Head imaging for uncomplicated headache	47,162	716,848	6.6%	\$22,165,445
2	Imaging at initial presentation for low back pain	10,644	68,634	15.5%	\$3,773,870
3	EEG testing at syncope encounters	1,846	112,513	1.6%	\$598,264
4	Head imaging for evaluation of syncope	6,703	97,468	6.9%	\$2,106,964
5	Screening for carotid artery stenosis in syncope encounters	1,782	75,080	2.4%	\$453,566
6	Sinus computed tomography (CT) for simple sinusitis	6,378	160,207	4.0%	\$2,564,371
7	Simultaneous use of brain and sinus CT	2,730	121,671	2.2%	\$776,548
8	Abdominal CT with and without contrast	11,477	240,049	4.8%	\$8,078,941
9	Thorax CT with and without contrast	1,576	150,085	1.1%	\$434,283
10	CT for suspected appendicitis without prior ultrasound	761	2,142	35.5%	\$696,997

Appendix Table 2: Low-Value Screening Measures, 2014

	Measure	Numerator	Denominator	Rate (per 100 persons)	Total Cost
1	Screening for carotid artery stenosis in asymptomatic adults	23,598	3,416,563	0.7	\$10,428,235
2	Cervical cancer screen, women 13-20	2,657	233,898	1.1	\$108,192
3	Cervical cancer screen, women 65+	17,873	449,535	4.0	\$723,200
4	Prostate-specific antigen screening, men 75+	24,150	127,670	18.9	\$965,208
5	Colorectal cancer screening, adults 85+	466	119,332	0.4	\$16,285

Appendix Table 3: Low-Value Pre-Operative Testing Measures, 2014

	Measure	Numerator	Denominator	Rate (% of Encounters)	Total Cost
1	Pre-op cardiac stress test (low-risk, non-cardiac surgery)	1,945	210,720	0.9%	\$500,727
2	Pre-op chest X-ray (low-risk, non-cardiac surgery)	11,562	210,720	5.5%	\$421,973
3	Pre-op pulmonary function test (low-risk, non-cardiac surgery)	1,125	223,658	0.5%	\$53,146

SOURCE: MDH/Health Economics Program, analysis of the MN APCD, March 2017; detailed specifications for each measure, including the affected population, are available online in a Technical Supplement to this issue brief: www.health.state.mn.us/data/apcd/publications.html

Notes: CT stands for computed tomography; EEG stands for electroencephalography; syncope encounters refers to fainting; carotid artery stenosis is a narrowing of blood vessels in the neck;