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Cohort Study of Overutilization of Preventive Screening for Patients With Pancreatic Cancer

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To the Editor:

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Overuse of medical services exists when the potential for harm of a service exceeds its capacity to benefit.¹ To reduce overuse, the American Board of Internal Medicine's Choosing Wisely campaign published recommendations to withhold breast, colorectal, and prostate cancer screening for patients with life expectancy less than 10 years.² These recommendations mandate scrutiny of preventive screening practices for patients already diagnosed with an aggressive malignancy such as pancreatic cancer, where 5-year survival after diagnosis is only 6%.³ We examine 4 common preventive screening practices—mammograms, colonoscopy, prostate-specific antigen (PSA), and cholesterol panels (cardiovascular disease)—that, when performed for screening purposes among patients with pancreatic cancer, demonstrate clear overuse.

In this study, patients with new diagnosis of pancreatic cancer in 2013 were identified from the Truven Health MarketScan Commercial Claims and Encounters Database (Truven Health Analytics, Inc., Ann Arbor, Mich). Waiver of international review board review was obtained. The frequency and costs (payments) associated with preventive health screening tests (colonoscopy, mammography, PSA, and cholesterol measurement) occurring after cancer diagnosis were determined using *International Classification of Diseases, Ninth Revision, and Current Procedural Terminology* procedure codes. Given the high cost of colonoscopy, a multivariable logistic regression was performed to identify factors predictive of undergoing screening colonoscopy.

A total of 7393 patients were identified with new pancreatic cancer diagnoses, of which 1025 patients (13.9%) underwent at least 1 of 4 screening tests after cancer diagnosis. Prostate-specific antigen measurement was the most common, occurring in 482 patients (12.6% of males), followed by colonoscopy (n = 339, 4.6%), cholesterol measurement (n = 234, 3.2%), and mammography (n = 97, 2.7% of females).

Colonoscopy had the highest cost, with a median total payment of US \$923 (interquartile range [IQR], 1195) per encounter (Fig. 1). Median payments were US \$101 (IQR, 108) for mammography, US \$20 (IQR, 26) for PSA, and US \$11 (IQR, 19) for cholesterol testing. The cost of colonoscopy screening, summed across all patients, was US \$451,000, with mammography totaling US \$12,600, PSA US \$17,400, and cholesterol US \$4400 for grand total of US \$485,400. Factors conferring worse prognosis were associated with a lower probability of undergoing screening colonoscopy on multivariable analysis (Table 1), including older age, more than 5 emergency department visits in preceding year, lymph node positivity, and hospice service utilization after cancer diagnosis. Patients treated with surgical resection, with or without chemotherapy, were most likely to undergo a screening colonoscopy with odds ratio of 1.614 ($P=0.011$) and 1.481 ($P=0.027$), respectively.

In this study of patients with a limited life expectancy owed to pancreatic cancer, preventive screening tests still occurred in 14% of individuals with costs totaling almost US \$500,000. Colonoscopy accounted for the bulk of this cost, while also placing significant burden upon patients, including bowel preparation, abstaining from solid food, time and travel to the appointment, and the risk of the procedure itself. We found that patients who underwent surgery were most likely to undergo screening colonoscopy, whereas factors associated with

a worse prognosis such as older age, treatment with chemotherapy alone, and high prior healthcare utilization were all predictive of a reduced likelihood of undergoing screening.

In the current era of the electronic health record, electronic “reminders” to both patients and physicians are commonplace and intended to increase compliance with screening guidelines. However, incorporating more advanced algorithms into the electronic health record reminders that account for diagnoses associated with limited life expectancy may help reduce screening test overuse. In addition, since colonoscopies are frequently scheduled well in advance, a previsit checklist may uncover changes in health that alter the need for colon cancer screening. These findings represent an opportunity for health care providers and administrators to develop system level changes to individualize preventative screening to minimize cost and unnecessary testing.

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REFERENCES

1. Chassin MR, Galvin RW. The urgent need to improve health care quality. Institute of Medicine National Roundtable on Health Care Quality. JAMA. 1998;280: 1000–1005. [PubMed: 9749483]
2. Morden NE, Colla CH, Sequist TD, et al. Choosing wisely—the politics and economics of labeling low-value services. N Engl J Med. 2014;370: 589–592. [PubMed: 24450859]
3. Sutton JM, Abbott DE. Neoadjuvant therapy for pancreas cancer: Past lessons and future therapies. World J Gastroenterol. 2014;20: 15564–15579. [PubMed: 25400440]

FIGURE 1.
Median payments for screening tests.

TABLE 1.

Logistic Regression for Predictors of Undergoing Colonoscopy

	OR (95% CI)	P
Age, y	0.967 (0.958–0.976)	<0.001
Sex, female	1.015 (0.807–1.276)	0.90
Comorbidity index	0.933 (0.854–1.020)	0.13
Location		
Urban	Reference	
Rural	0.756 (0.526–1.087)	0.13
Region		
West	Reference	
South	1.309 (0.920–1.864)	0.13
North Central	1.174 (0.802–1.720)	0.41
Northeast	1.361 (0.953–1.946)	0.09
ED visits (y prior)		
0	Reference	
1–2	0.769 (0.399–1.479)	0.43
3–4	0.856 (0.434–1.687)	0.65
5+	0.207 (0.049–0.875)	0.03
Inpatient hospital days (y prior)		
0	Reference	
1–4	1.338 (0.926–1.935)	0.12
5–9	0.992 (0.584–1.685)	0.98
10+	0.990 (0.526–1.865)	0.98
Insurance type		
PPO	Reference	
Comprehensive	0.929 (0.642–1.344)	0.69
HMO	1.031 (0.724–1.467)	0.87
CHDP/HDHP	1.287 (0.828–2.000)	0.26
Other	1.233 (0.844–1.802)	0.28
Lymph node status		

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OR (95% CI)		P
Negative	Reference	
	0.687 (0.529–0.892)	0.005
Positive		
	Reference	
	0.816 (0.603–1.104)	0.19
	1.481 (1.046–2.097)	0.027
	1.614 (1.119–2.330)	0.011
	0.656 (0.485–0.888)	0.006

OR indicates odds ratio; chemo, chemotherapy; PPO, preferred provider organization; HMO, health management organization; CHDP/HDHP, comprehensive high deductible plan/high deductible health plan; ED, emergency department.