stringent criteria used by CMS for sepsis and extended the CMS criteria to identify the remaining 4 conditions to 10 discharge diagnoses fields. We estimated costs for readmissions using previous approaches.[5]

We performed pairwise comparisons of proportions of index admissions, length of stay, and cost for each of the 5 conditions using multinomial logistic, negative binomial, and γ regression, respectively. For all analyses, robust standard errors were used, and 2-sided P values less than .005 were considered significant to account for multiple comparisons. All statistical analyses were performed using SAS (SAS Institute), version 9.3, and Stata (StataCorp), version 13.1.

Results | Among 14 325 172 hospitalizations, we identified 1 187 697 index admissions for medical reasons that were associated with an unplanned 30-day readmission. Of those, 147 084 (12.2%; 95% CI, 11.9%-12.4%) had a diagnosis of sepsis, 15 001 (1.3%; 95% CI, 1.2%-1.3%) AMI, 79 480 (6.7%; 95% CI, 6.5%-6.8%) heart failure, 54 396 (4.6%; 95% CI, 4.5%-4.8%) COPD, and 59 378 (5.0%; 95% CI, 5.0%-5.3%) pneumonia. Among sepsis index admissions, 1061 (0.7%) also had diagnostic codes that met CMS criteria for AMI, 5063 (3.4%) heart failure, 4829 (3.3%) COPD, and 11 093 (7.5%) pneumonia.

The mean length of stay for unplanned readmissions following sepsis hospitalization was longer than readmissions following AMI, heart failure, COPD, and pneumonia (Table). The estimated mean cost per readmission was highest for sepsis compared with the other diagnoses ($10 070 [95% CI, $10 021-$10 119] for sepsis, $8417 [95% CI, $8355-$8480] for COPD, $9051 [95% CI, $8990-$9113] for heart failure, $9424 [95% CI, $9279-$9571] for AMI, and $9533 [95% CI, $9466-$9600] for pneumonia; P < .005 for all pairwise comparisons). Sepsis remained a leading cause of readmissions and cost in sensitivity analyses using the CMS sepsis criteria and extending the CMS criteria for AMI, heart failure, COPD, and pneumonia to 10 discharge diagnoses fields (Table).

Discussion | Among medical conditions, sepsis is a leading cause of readmissions and associated costs. Adding sepsis to the Hospital Readmission Reduction Program may lead to development of new interventions to reduce unplanned readmissions and associated costs. This study is limited in that the National Readmissions Database uses state specific identifiers that cannot follow-up patients across states, which may underestimate readmission rates. In addition, readmission rates and cost estimates may vary based on different sepsis definitions.

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Genetic Testing and Counseling Among Patients With Newly Diagnosed Breast Cancer

Germline genetic testing of patients with breast cancer is an important model of how increasingly widespread genomic sequencing can influence treatment decision making. Testing of 2 breast cancer–associated genes, *BRCA1* and *BRCA2*, has been available for 20 years, but new massively parallel sequencing technology and less restrictive patent laws have made multiplex panel tests available at much lower costs.[1] Yet little is known about recent patient experience with genetic

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Table 1. Patient Characteristics Among Patients With Newly Diagnosed Breast Cancer

Characteristic[a]	All Patients[b]		High-Risk Patients Only[c]		Relative Risk of No Genetic Testing	
	No. (%)	Weighted Mean or % (95% CI)[d]	No. (%)	Weighted Mean or % (95% CI)[d]	Unadjusted[e]	Adjusted[f]
Age at survey administration, y						
Mean (SD)	61.9 (11)	62.0	58.6 (13)	58.9	1.04 (1.03-1.04)[g]	1.04 (1.03-1.05)
Race/ethnicity[h]						
Non-Hispanic white	1350 (53.4)	56.8 (54.7-58.8)	406 (52.5)	55.9 (52.2-59.6)	1 [Reference]	1 [Reference]
Non-Hispanic black	445 (17.6)	17.8 (16.2-19.4)	134 (17.3)	17.6 (14.7-20.5)	1.14 (0.94-1.39)	1.13 (0.93-1.37)
Hispanic	442 (17.5)	13.9 (12.6-15.3)	140 (18.1)	14.7 (12.2-17.1)	0.97 (0.76-1.10)	1.18 (0.92-1.52)
Asian	222 (8.8)	8.9 (7.7-10.0)	69 (8.9)	8.8 (6.8-10.9)	1.10 (0.85-1.43)	1.39 (1.04-1.85)
Missing	70 (2.8)	2.7 (2.0-3.3)	24 (3.1)	3.0 (1.8-4.3)		
Education						
High school or less	750 (29.5)	27.7 (25.9-29.6)	224 (29.0)	26.7 (23.4-29.9)	1 [Reference]	1 [Reference]
At least some college	1752 (69.3)	71.2 (69.3-73.0)	539 (69.7)	72.2 (68.9-75.5)	0.73 (0.62-0.86)	1.00 (0.81-1.23)
Missing	30 (1.2)	1.1 (0.7-1.5)	10 (1.3)	1.1 (0.4-1.9)		
Insurance status						
Private	1309 (51.8)	52.7 (50.7-54.8)	416 (53.8)	54.6 (50.9-58.4)	1 [Reference]	1 [Reference]
Medicaid or other public insurance	385 (15.2)	14.2 (12.8-15.6)	125 (16.2)	15.1 (12.5-17.7)	1.35 (1.08-1.69)	0.98 (0.76-1.26)
Medicare	722 (28.6)	28.8 (26.9-30.7)	190 (24.6)	25.1 (21.8-28.4)	1.82 (1.54-2.14)	0.94 (0.78-1.13)
None	13 (0.5)	0.6 (0.2-0.9)	5 (0.6)	0.8 (0.1-1.6)		
Missing	100 (4.0)	3.7 (2.9-4.4)	37 (4.8)	4.4 (2.9-5.9)		
Income of household, $						
≥90 000	615 (24.3)	25.8 (23.9-27.6)	195 (25.2)	27.8 (24.4-31.3)	1 [Reference]	1 [Reference]
40 000-89 999	682 (27.0)	27.8 (25.9-29.7)	193 (25.0)	25.4 (22.1-28.7)	1.29 (1.02-1.64)	1.09 (0.87-1.35)
<40 000	776 (30.7)	29.3 (27.5-31.2)	240 (31.0)	28.6 (25.3-32.0)	1.58 (1.28-1.95)	1.19 (0.95-1.51)
Missing	456 (18.0)	17.1 (15.6-18.7)	145 (18.8)	18.1 (15.2-20.9)		
Cancer stage						
0	489 (19.3)	26.4 (24.4-28.4)	183 (23.7)	30.3 (26.6-34.0)	1 [Reference]	1 [Reference]
I-II	1962 (77.6)	71.2 (69.1-73.2)	590 (76.3)	69.7 (66.0-73.4)	0.91 (0.78-1.08)	0.95 (0.85-1.06)
Missing	78 (3.1)	2.5 (1.9-3.0)	0	0		

[a] Patients provided information on race/ethnicity, family cancer history, insurance, education, and income. Surveillance, Epidemiology, and End Results (SEER) registries provided information on age, cancer stage, and biomarkers (estrogen and progesterone receptors, *ERBB2* [formerly *HER2*]).

[b] Of the selected 3880 women diagnosed with early-stage breast cancer between July 2013 and September 2014, 249 were ineligible due to having a prior breast cancer diagnosis or stages III-IV, residing outside the SEER registry area, or being deceased, too ill, or unable to complete a survey in Spanish or English. Of 3631 eligible women remaining, 1053 could not be contacted or did not participate. Of 2578 patients who responded (71%), 49 were ineligible because of genetic testing before their diagnosis, leaving 2529 for the study sample.

[c] Patients were categorized as high risk if they had 1 or more of the following: 45 years or younger at breast cancer diagnosis; bilateral breast cancer; triple-negative breast cancer diagnosed at 60 years or younger; any relative with ovarian cancer, sarcoma, or male breast cancer; 2 or more first-degree relatives with breast cancer; for patients diagnosed at age ≤50: 1 or more first-degree relative with breast cancer; Ashkenazi Jewish ancestry; or family history of a deleterious genetic mutation (*BRCA1* or *BRCA2* or another mutation associated with increased breast cancer risk [eg, *TP53*]). All other patients were categorized as average risk.

[d] Survey design and nonresponse weights were created to compensate for the differential probability of selecting patients by race, stage, and SEER site and to adjust for survey nonresponse. The weights were normalized to equal the observed sample size and all analyses were weighted.

[e] Univariate log-linear models were corrected for multiple imputation.

[f] A multivariable log-linear model (Poisson distribution with log link) was used that was corrected for multiple imputation and used robust standard error estimation. Survey and SEER item nonresponse was low (<4%) for most covariates and higher for self-reported income (17%). To correct for potential nonresponse bias, values for missing items were imputed using sequential multiple imputation. Results were compared between sequential multiple imputation analyses and complete-case analyses for any meaningful differences. The model was simultaneously adjusted for the covariates listed within Table 1 and additionally for site (SEER catchment area: Los Angeles County vs state of Georgia).

[g] Relative risk per 1 year of age.

[h] Race/ethnicity was self-reported by the individuals according to the following options provided by the investigators: "white, black or African American, Native Hawaiian or other Pacific Islander, Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, other Asian (please explain), other race (please explain)." Race/ethnicity was assessed because of past studies that have reported differences in access to genetic testing according to race/ethnicity.

testing and counseling. Genetic counselors are experts in risk assessment and communication, but because of workforce limitations, some physicians must counsel and test patients without their assistance.[2] These challenges motivated this investigation of patients' use of and perspectives on genetic counseling and testing.

Table 2. Patient Preferences and Experiences of Genetic Testing Among Patients With Newly Diagnosed Breast Cancer

Preferences and Experiences	High-Risk Patients (n = 773)[a]		Average-Risk Patients (n = 1678)[a]	
	No. of Patients	Weighted % (95% CI)[b]	No. of Patients	Weighted % (95% CI)[b]
Wanted testing	626	80.9 (78.0-83.9)	1022	59.3 (56.8-61.8)
Talked with any clinician about testing	544	70.9 (67.5-74.3)	606	35.9 (33.4-38.3)
Talked with genetic counselor	306	39.6 (35.9-43.3)	247	14.4 (12.6-16.2)
Had genetic testing	404	52.9 (49.1-56.6)	309	17.8 (16.0-19.9)

[a] Patients were categorized as high risk if they had 1 or more of the following: 45 years or younger at breast cancer diagnosis; bilateral breast cancer; triple-negative breast cancer diagnosed at 60 years or younger; any relative with ovarian cancer, sarcoma, or male breast cancer; 2 or more first-degree relatives with breast cancer; for patients diagnosed at age ≤50: 1 or more first-degree relative with breast cancer; Ashkenazi Jewish ancestry; or family history of a deleterious genetic mutation (*BRCA1* or *BRCA2* or another mutation associated with increased breast cancer risk [eg, *TP53*]). All other patients were categorized as average risk.

[b] Survey design and nonresponse weights were created to compensate for the differential probability of selecting patients by race, stage, and Surveillance, Epidemiology, and End Results (SEER) site and to adjust for survey nonresponse. The weights were normalized to equal the observed sample size and all analyses are weighted.

Methods | The study was approved by the University of Michigan institutional review board, which waived the requirement for patient consent. Women aged 20 through 79 years, diagnosed with stages 0 to II breast cancer between July 2013 and September 2014, identified by Surveillance Epidemiology and End Results registries of Georgia and Los Angeles County, were mailed surveys (Supplement) 2 months after surgical operation. Survey questions addressed how much patients wanted genetic testing (not at all, a little bit, somewhat, quite a bit, very much: the latter 4 were defined as wanting testing); and whether patients talked about testing with any "doctor or other health professional," had a session with a genetic counseling expert, or had testing. Cancer family history, ancestry, and clinical information were used to construct a guideline-concordant measure of high pretest risk for mutation carriage.[3] A log-linear model was constructed using SAS (SAS Institute), version 9.4, to compute risk ratios, adjusting for covariates (listed in **Table 1**) and weighted for survey design and nonresponse to identify variables independently associated with failure to receive testing among high-risk patients.

Results | A total of 2529 women (71%) responded to the survey. The mean age was 62 years (SD, 11); 56.8% were white, 17.8% black, and 71.2% had some college education (Table 1). Sixty-six percent (95% CI, 64.2%-68.2%) reported wanting testing and 29.0% (95% CI, 27.1%-30.9%) reported having a test. Thirty-one percent (n = 773; 95% CI, 29.2%-33.1%) of patients had a high pretest mutation risk. Among average-risk patients, 59.3% (95% CI, 56.8%-61.8%) wanted testing, 35.9% (95% CI, 33.4%-38.3%) reported talking about testing with a doctor or other health professional, and 17.8% (95% CI, 16.0%-19.9%) had testing (**Table 2**). Among high-risk patients, 80.9% (95% CI, 78.0%-83.9%) wanted testing, 70.9% (95% CI, 67.5%-74.3%) talked about testing with a doctor or other health professional, 39.6% (95% CI, 35.9%-43.3%) had a session with a genetic counseling expert, and 52.9% (95% CI, 49.1%-56.6%) had testing. Of tested high-risk patients, 61.7% (95% CI, 56.6%-66.7%) had an expert genetic counseling session. The most common reason high-risk patients reported for not testing was "my doctor didn't recommend it" (56.1%), "too expensive" (13.7%), "I did not want it" (10.7%), and "my family didn't want me to get it" (0.2%). On multivariable analysis (Table 1), characteristics associated with no testing included older age and Asian ethnicity but not education, income, or insurance.

Discussion | In this large, population-based study, most patients reported wanting genetic testing and 29% reported having it. Yet only 39.6% of all high-risk women and 61.7% of tested high-risk women reported having a genetic counseling session. This suggests a gap between need and availability of genetic counseling. Only 52.9% of high-risk patients had a genetic test, representing a missed opportunity to prevent ovarian and other cancer deaths among mutation carriers and their families. High-risk patients most vulnerable to undertesting included Asians and older women, despite evidence that many such patients carry mutations.[4,5]

Clinical need for genetic testing may not be adequately recognized by physicians. High-risk patients reported lack of a physician's recommendation, not expense, as their primary reason for not testing. Limitations of the study included the testing data source being by patient self-report and that the patients lived in only 2 geographic regions. The findings emphasize the importance of cancer physicians in the genetic testing process. Priorities include improving physicians' communication skills and assessments of patients' risk and desire for testing, and optimizing triage to genetic counselors.

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COMMENT & RESPONSE

OnabotulinumtoxinA vs Sacral Neuromodulation for Urgency Incontinence

To the Editor In a multicenter, open-label randomized trial by Dr Amundsen and colleagues,[1] 190 women received a single injection of 200 U onabotulinumtoxinA and showed a mean reduction of 3.9 daily episodes of urinary incontinence over 6 months compared with a reduction of 3.3 episodes for 174 women who underwent sacral neuromodulation. The clinical significance of this difference is uncertain. I would like to point out some potential weaknesses in the study.

First, 100 U onabotulinumtoxinA is the dose approved by the US Food and Drug Administration for idiopathic overactive bladder with urgency urinary incontinence. The more expensive 200 U dose used in the trial is the dose for patients with spinal cord injury or multiple sclerosis with neurogenic bladder and urinary incontinence, a different population. Using 200 U is an off-label use in idiopathic overactive bladder and is associated with more complications, such as bladder infections and failure to empty the bladder sufficiently.[2] The authors argued that 200 U of onabotulinumtoxinA has a similar effect as 100 U but that is true only up to 24 weeks.[2] After 24 weeks, the beneficial effect of 100 U decreases rapidly.

Second, patients with idiopathic overactive bladder receive an injection of 100 U of onabotulinumtoxinA usually twice a year. In our practice, many patients ask after a few years for a more definitive solution, because they do not want to receive regular injections under general or local anesthesia for the rest of their lives. Most patients choose to receive sacral neuromodulation with a battery, which has to be replaced every 5 years. Therefore, this study would benefit from a longer follow-up to provide more detailed information on patient preferences.

Third, the study group included only patients who had 2 or more urgency incontinence episodes per day. Such symptoms are usually reported by older patients with severe leakage who represent about 20% of those in the population of patients with idiopathic overactive bladder.[3] Patients with overactive bladder without incontinence do not have another disease compared with overactive bladder with incontinence, but they are usually younger, more mobile, and able to reach the toilet in time. This may explain why the mean age of the patients was higher than reported in other studies on sacral neuromodulation.[4,5] Because most patients with overactive bladder were excluded, this study covers only a small selection of patients on the overactive bladder spectrum, and the results cannot be extrapolated to all patients with overactive bladder.

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