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The Costs and Quality of Care for Three Common Illnesses at Retail Clinics as Compared to Other Medical Settings

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Abstract

Background—Retail clinics are an increasingly popular source for medical care. Concerns have been raised about the impact of these clinics on costs, quality, and delivery of preventive care.

Objective—To address these concerns, we compared the care for three acute conditions at retail clinics and other care settings.

Setting—Enrollees of a large Minnesota health plan

Patients—Enrollees who received care for otitis media, pharyngitis, or urinary tract infection (UTI)

Design—We aggregated 2005–2006 claims data from a large health plan into care episodes (units that included initial and follow-up visits, pharmaceuticals, and ancillary tests). After identifying 2100 episodes (700 each) in which otitis media, pharyngitis, and UTI were treated first in retail clinics, we matched them with episodes in which these illnesses were treated first in physician offices, urgent care clinics and emergency departments.

Measurements—Costs per episode, performance on 14 quality indicators, receipt of 7 preventive care services at the initial appointment or subsequent 3 months.

Results—Overall costs of care for episodes initiated at retail clinics were substantially lower than matched episodes initiated at physician offices, urgent care clinics, and emergency departments ($110 vs. $166, $156, $570 respectively, p<0.001 for each comparison). Prescription costs were similar in

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retail clinics, physician offices, and urgent care clinics ($21, $21, $22), as were aggregate quality scores (63.6%, 61.0%, 62.6%), and patient's receipt of preventive care (14.5%, 14.2%, 13.7%) (p>0.05 for comparisons with retail clinics). At emergency departments, average prescription costs were higher and aggregate quality scores were significantly lower.

Limitations—Analyzing claims data limits the number of quality measures and preventive care services studied. Despite matching, patients at different care sites might differ in their severity of illness.

Conclusions—Compared to physician offices and urgent care clinics, retail clinics provide less costly treatment for three common illnesses, with no apparent adverse impact on quality of care or delivery of preventive care.

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INTRODUCTION

Retail clinics provide a new model of urgent care. Located in retail stores such as pharmacy, discount, or grocery chains, these clinics require no appointments, are open on weekends and evenings, report little waiting time,(1) and offer services limited to immunizations and treatment of minor acute conditions.(2) Compared to outpatient physicians, retail clinics serve a population that is younger, more likely to be uninsured, and less likely to have a primary care physician.(2) There are already almost one thousand retail clinics in the United States (3) with the number expected to increase steadily and surveys indicate that about 15% of children and 19% of adults report being likely to use them in the near future.(4)

Since the first retail clinics opened in 2000, they have been the subject of controversy. Retail clinic companies assert that they can provide convenient, low-cost, high-quality care through the use of strict guideline-based protocols and well-trained nurse practitioners.(5,6) However, several physician organizations, including the American Medical Association and American Academy of Pediatrics, have raised concerns about the quality of care that retail clinics deliver, (7–13) including the incentive to over prescribe medications.(14) There are other concerns that unforeseen complications might result in patients visiting a physician anyway resulting in increased health care costs.(7) Lastly, because retail clinic providers lack a record of a patient's preventive services they may be less likely to identify and deliver missing preventive care. (12)

To evaluate the validity of these concerns, we analyzed claims data from a large Minnesota insurer that has been providing coverage for its enrollees at retail clinics for over 5 years. We compared the costs of care, quality of care, and delivery of preventive services for patients receiving care for three conditions commonly treated in retail clinics (urinary tract infection (UTI), otitis media, and pharyngitis) with care in physician offices, urgent care clinics, and emergency departments.

METHODS

Study Population

We examined the claims filed by HealthPartners enrollees in 2005–2006. HealthPartners is one of the largest health plans in Minnesota. We focused our study in Minnesota because retail clinics first originated in Minnesota and are both common and well-established in the state.

Aggregating Claims for Conditions of Interest

We used a commercial program, Symmetry Episode Treatment Groups (Ingenix, Version 6.0, Eden Prairie, Minnesota), to aggregate the claims from HealthPartners enrollees into episodes

of care(15). Each episode consisted of visits, pharmaceutical claims, and ancillary tests documented over the entire course of a given illness for a single patient. We examined the entire episode of care so that we could capture the total costs of care for an acute illness, rather than just a visit. The assignment of claims to a given episode was based on the diagnosis codes and procedure codes on the claims. Each episode had to have at least one initial provider visit identified by an evaluation & management (E&M) code that defined the beginning of the episode. An episode was considered complete when no additional services were billed for the episode for 30 days.

We focused on episodes of otitis media (episode number 329 – otitis media without surgery), pharyngitis (331- tonsillitis, adenoiditis, or pharyngitis, both viral and bacterial, without surgery), and urinary tract infection (UTI) (574 - infection of the lower genitourinary system) because these three conditions accounted for 48% of all acute care visits to retail clinics nationally(2) and because of available performance measures of quality for them. To be considered for our study, the episode had to start in 2005 or 2006 (care could extend into 2007).

Matching the Episodes of Care

To address the concern that confounding could explain differences observed between the care sites, we used we used multivariable matching in which each episode at a retail clinic was matched to episodes at other care locations on five variables. Because of the great imbalance between the number of episodes at retail clinics and episodes at other care settings among health plan enrollees, we believe this approach is more efficient and potentially less biased than the most common alternative approach, multivariate regression.(16,17) We categorized episodes according to the location of the first E&M visit in the episode: retail clinic, physician office, urgent care clinic, or emergency department. If the first visit in the episode was at a retail clinic and a subsequent visit the next day was at an emergency department it was categorized as a retail clinic episode. For each of the three conditions, we identified 700 episodes which originated at a retail clinic. We then matched each retail clinic episode with up to three physician office episodes, up to three urgent care clinic episodes, and up to one emergency department episode selected at random from eligible episodes. Few episodes for these conditions originated in the emergency department.

Matching was based on condition (UTI, pharyngitis, otitis media), patient's age (±2 years), gender, comorbidity score (±0.2 points), and income category as a proxy for socioeconomic status. We based comorbidity scores on Adjusted Clinical Group risk scores (Johns Hopkins, Version 7.06, Baltimore, Maryland, www.acg.jhsph.edu). We estimated each enrollee's income category based on the average income within the census tract in which they reside. We divided all census tracts in which enrollees resided into mean income tertiles (lowest third < $37,068, middle third $37,068-49,296, highest third >$49,296).

Measuring the Costs of Care

To measure costs of care of each claim we calculated the sum of the health plan reimbursement plus any patient co-payments. We then divided the claims within an episode into five categories: E&M visits, pharmaceuticals, laboratory and imaging services, inpatient care, and other. For each episode we calculated costs for each category and overall costs.

Claims for pharmaceuticals and inpatient care were identified by the health plan. We used the Berenson-Eggers Type of Service (BETOS) system to assign the claims to the other categories. The BETOS system was developed by the Centers for Medicare and Medicaid Services and assigns all Current Procedural Terminology (CPT) or Healthcare Common Procedure Coding System codes to a BETOS category.(18) Laboratory and imaging were identified by BETOS categories 3 (imaging) and 4 (tests). E&M visits were identified by BETOS category 1 (E&M

visits) except we excluded codes CPT 59400, 59425, 59426 and 59510 which is consistent with other E&M definitions based on the BETOS system.(19,20) Costs of all unassigned services were attributed to "other".

Our cost comparisons could be biased if patients seen outside retail clinics were more likely to (1) have a more severe acute illness (e.g. pharyngitis *and* peritonsillar abscess) (2) have been treated for both the acute illness *and* a chronic illness, or (3) have more chronic illnesses. Besides matching on patient's comorbidity and sociodemographic variables we conducted two sensitivity analyses to address these concerns (details in appendix). First, we restricted our sample to a shorter list of primary diagnosis codes to restrict the variation in problems being addressed. Second, we further restricted our sample to visits where only a single diagnosis code (out of four) to reduce the number of cases where there was a complication of the illness (e.g. peritonsillar abscess) or the patient was also treated for a chronic illness (e.g. hypertension).

In another analysis we calculated *total* costs of care (excluding the episode of interest) for patients over a 12-month period, from 6 months prior to the start of the episode of interest through 6 months afterward. This allowed us to assess potential confounding due to differences in health status for patients receiving care at the different sites.

Measuring the Quality of Care

We constructed 14 quality indicators from several sources. RAND's QA tools, adapted for use with claims records, were our primary source.(21–25) We also used performance measures based on guidelines for otitis media from the American Academy of Pediatrics and the American Academy of Family Physicians (26) and guidelines for streptococcal pharyngitis from the Infectious Diseases Society of America.(27) We present rates of streptococcal testing separately for children/adolescents and adults. While there is consensus that all children should be tested before initiating treatment, there is some controversy on the use of empirical treatment of streptococcal disease among adults.(28,29) We provide details on the source and eligibility of all measures in the appendix.

To produce aggregate quality scores, we divided all instances in which recommended care was delivered by the number of times that patients were eligible for receipt of this care at each care setting. We conducted a sensitivity analysis in which we limited our sample to episodes in which there was only one diagnosis on the E&M claim.

Determining the Rates of Preventive Care

We examined whether patients received specific preventive services in the three months following the first visit (including any preventive services in that visit) by looking at both diagnosis and procedure codes for *all* claims during that period for the following services: preventive health examination (V20.2, V70.0, V72.3, V70.9), preventive vaccination (International Classification of Disease (ICD-9) diagnosis codes V03-V06 & CPT 90657-90660, 90655, 90656, 90732), mammogram (CPT 76090-76092, G0202), Papanicolaou smear (CPT 88141-88154,88164-88167, 88174, 88175, ICD9 91.46, V76.2), colon cancer screening (CPT 44388-44394, 44397, 45355, 45378-45383,45385- 45387, 74270, 74280, 82270, 82274, 45300,45331-45335, 45337-45338, 45341, 45342, 45345), and cholesterol/lipid testing (CPT 83721, 82465, 83718-83719). In a sensitivity analysis, we expanded the time period that preventive care could be provided from 3 to 6 months.

Statistical Analyses

We treated matched sets as the primary units of analysis in our comparisons of costs and preventive care services. In comparisons of costs, we used SAS Proc Mixed in which matched sets (episodes in retail clinics matched with episodes in other settings) were included as a

random effect and the setting (retail clinic versus other setting) was included as a fixed effect. For the preventive care and quality measures, we used SAS Proc Glimmix program in which matched sets were again included as a random effect and we specified a binomial distribution with a logit link function. We chose a random effects model because for the preventive and quality measures there were frequently matched sets in which all episodes in the set had identical outcomes (e.g. no patients in the set received colon cancer screening) or matched sets that only included episodes from one care site (e.g. a quality indicator was only triggered by a physician office episode). In a fixed effect analysis (e.g. conditional logistic regression) such sets do not contribute to the analysis, but in a random effect model these sets contribute to the variance estimate.(30) We conducted sensitivity analyses using a stratified analysis and there were no substantive changes in the results. We used SAS Version 9.1 (SAS Institute, Cary, NC) to conduct all analyses, and a p value of <0.05 was considered significant.

RESULTS

Study Sample

We identified 2100 episodes in retail clinics that were matched based on age, gender, co-morbidities, and income to 6211, 5880, and 979 episodes at physician offices, urgent care clinics, and emergency departments, respectively giving us a total of 15,170 episodes.

Women and those in the highest income category accounted for the majority of episodes in retail clinics (Table 1). Although most patients with otitis media (68.8%) were <18 years old, most patients with pharyngitis (55.1%) and almost all patients with UTI (98.3%) were ≥18 years old.

Costs of Care

Overall costs of care for episodes initiated at retail clinics were substantially lower than matched episodes initiated at physician offices, urgent care clinics, and emergency departments ($110 vs. $166, $156, $570 respectively, $p<0.001$ for each comparison) (Table 2). This difference was consistent across the three conditions.

The difference in overall costs was primarily driven by the costs for E&M visits. Mean E&M visit costs in retail clinics ($66) were significantly lower than those in other settings ($106, $103, and $358 in physician offices, urgent care clinics, and emergency department, respectively, $p<0.001$) (Table 2). The percentage of episodes with any follow-up visits were similar for retail clinics, physician offices, and urgent care clinics (16.0% vs. 15.1%, 14.2%, $p>0.05$ for all comparisons). However, compared to retail clinic episodes, episodes originating in emergency departments were more likely to have follow-up (16.0% vs. 24.5% $p<0.001$). Costs for laboratory and imaging services were lower at retail clinics than in other settings ($15 vs. $33, $27, $113, $p<0.01$ for each comparison).

Prescription costs per episode were similar for episodes originating in retail clinics, physician offices, and urgent care clinics ($21, $21, $22, respectively, $p>0.05$ for comparisons) and higher for those originating in emergency departments ($26, $p=0.02$ comparison to retail clinics).

Of the 15,170 episodes in our sample only 11 (0.07%) included hospitalizations of which 2 involved patients originally seen at retail clinics. Aggregate patient costs for a 12 month period excluding the episode of interest and all other care were $1236, $1435, $1243, and $2157 for episodes initiated at retail clinics, physician offices, urgent care clinics, and emergency departments respectively.

Quality of Care

Aggregate quality scores were similar at retail clinics, physician offices, and urgent care clinics (63.6%, 61.0%, 62.6% respectively, $p>0.05$ for comparisons with retail clinics) and lower for emergency departments (55.1%, $p<0.001$ for comparison with retail clinics). There were substantial variations in performance across the 14 measures (Table 3). On most measures, quality scores at retail clinics were equal to or higher than those in other care settings. One exception is that a smaller proportion of high-risk patients (29.6%) had a urine culture obtained at retail clinics than in other care settings (56.8% physician office, 58.1% urgent care clinics, 54.8% emergency departments, $p<0.05$ for comparisons with retail clinics).

Preventive Care

The proportions of patients who received preventive care on or within 3 months of their first visit (Table 4) did not vary significantly across three care settings (14.5% retail clinics, 14.2% physician offices, 13.7% urgent care clinics, $p>0.05$ for comparisons with retail clinics). A lower fraction, 10.7%, of patients first seen at emergency departments received any preventive care ($p=0.003$ comparison with retail clinics). The most common type of preventive care was a preventive health examination.

Sensitivity Analyses

The results of sensitivity analyses did not differ substantively from the results reported above.

DISCUSSION

There has been concern that the increasing number of patients receiving care at retail clinics might lead to increased health care costs, greater rates of misdiagnoses, over-use of antibiotics, and decreased delivery of preventive care. When we compared these aspects of care in retail clinics, physician offices, urgent care clinics, and emergency departments, we found little evidence to support these concerns.

In our study of the care for three acute illnesses, the costs of care in retail clinics were 30 to 40% lower than those in physician offices and urgent care clinics and were 80% lower than those in emergency departments. The differences were primarily attributable to lower reimbursements for E&M visits and also lower rates of laboratory testing in retail clinics. This is consistent with other cost comparisons using a different method.(31)

We found that the quality of care in retail clinics was similar to care provided in physician offices and urgent care clinics and slightly superior to the quality in emergency departments. Nurse practitioners, rather than physicians, generally provide the care in retail clinics and our finding is consistent with previous research showing no difference in the quality of care delivered by nurse practitioners and physicians.(32,33) There have been concerns that, because they are owned by pharmacy chains, retail clinics will be more aggressive in terms of prescribing antibiotics. We found similar rates of antibiotic prescribing at retail clinics, physician offices, and urgent care clinics. We could not independently assess the accuracy of diagnoses, but if patients are misdiagnosed at their initial visit to a retail clinic, we would expect more patients to have a follow-up visit which was not the case.

There have also been concerns that patients who visit retail clinics will be less likely to receive preventive care than if they had received similar care at a physician's office. We found that the rates of preventive care received at the initial visit through the subsequent three months were similar. For patients who visit a retail clinic, preventive care was typically delivered in a physician's office suggesting that the clinics are not disrupting opportunities for preventive services.

Our study had several limitations. We focused on commercially-insured patients in Minnesota few of whom had co-morbid illnesses. Consistent with previous analyses of the demographics of retail clinic patients,(2) the majority of patients in our sample were female and young adults. Moreover, the patients in our sample lived in zip codes with higher incomes and all had insurance. Nationally up to one-third of patients who visit a retail clinic do not use insurance to pay for the visit.(2) Therefore our findings may not generalize to other regions of the country, patients who are uninsured or with public insurance, the poor, the elderly, and those with numerous chronic morbidities. MinuteClinic is the dominant retail clinic in Minnesota and our results might not generalize to other retail clinic chains though most chains use a similar care model and MinuteClinic currently operates 52% of all retail clinics in the United States.(2) Also, our comparison was limited to three acute diagnoses which are among the most common reasons for retail clinic visits, but our results may not generalize to other conditions. While we found no adverse impact on preventive care, it is possible that in the future if patients visit retail clinics for most of their care than preventive care might be adversely impacted. We analyzed claims, and this limited the scope of quality metrics and preventive care services examined. We measured costs by summing health plan reimbursement and patient co-payments, but the uninsured are often charged more than health plans(34,35) and therefore we may have under-estimated the savings for the uninsured.

We matched patients on four criteria, but it is possible that the case and control patients remain different. For example, despite our matching, patients who visited a physician office could have had more severe chronic illnesses, patients who visited the emergency department could have a more severe acute illness, or patients who visited a physician could have been treated for both an acute illness and a chronic illness. In our sensitivity analyses that addressed these concerns we found similar results implying there was no notable selection bias after matching. Nonetheless, we acknowledge such differences remain a possibility because physicians might treat a chronic illness, but not list this chronic illness as a secondary diagnosis code. Aggregate patient costs over twelve months for the patients who visited a physician office ($1435) or emergency department ($2157) were higher than those who visited the retail clinic ($1236) and these differences could represent unmeasured differences in severity of illness.

In the emergency department, fewer patients were treated with antibiotics for otitis media or pharyngitis. This could be because these patients were less ill, there was more judicious use of antibiotics, or there was a different mix of clinical presentations between the care sites.

Our findings do not imply that the overall populations of patients who visit the care sites are similar. Our comparison is limited to a limited pool of patients who are matched on characteristics. It is likely that patients with a mild illness and few comorbidities triage themselves to a retail clinic while those with a more severe illness or more comorbidities will go to their physician or to an emergency department. From a societal perspective, if more patients with a mild illness go to a retail clinic this might lead to a better allocation of health care resources.

There are several concerns with retail clinics that our study cannot address. It is possible that greater market penetration of retail clinics will exacerbate the already substantial problems of fragmented health care and poor communication among health care providers and between patients and providers.(13,36) Currently most independent retail clinic providers can provide patients with a printed visit summary from their electronic medical records or the clinic can fax the record to a physician on patient request.(37) However, we do not know how often this occurs and whether the pattern of communication is better or worse than what is seen between other care providers.(36) Furthermore, because retail clinics are very convenient to use, patients who would not have sought any care previously may now go to a retail clinic.(38) This would increase overall health care utilization and in turn increase costs. We found that overall costs

of care for a one year period were comparable or lower among patients who went to retail clinics, but this issue needs to be addressed more fully in further research.

In conclusion, we found that for three common illnesses retail clinics offered services at lower costs than alternative settings with quality that is good or better and that patients who visited retail clinics were as likely to receive preventive care as those who visited other care settings.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Patient Characteristics of Retail Clinic Episodes

Characteristics	Otitis Media (n=700)	Pharyngitis (n=700)	Urinary Tract Infection (n=700)
	number (percent)		
Gender			
Male	314 (44.8)	286 (40.9)	0 (0)
Female	386 (55.2)	414 (59.1)	700 (100.0)
Age (years)			
<2	0 (0)	0 (0)	0 (0)
2–5	193 (27.5)	58 (8.3)	0 (0)
6–17	275 (39.3)	256 (36.6)	12 (1.7)
18–44	193 (24.5)	313 (44.7)	472 (67.5)
45–64	61 (8.7)	73 (10.4)	213 (30.4)
>65	0 (0)	0 (0)	3 (0.4)
Income of census block of enrollee's residence			
Lowest third (<$37,068)	19 (2.7)	30 (4.3)	43 (6.2)
Middle third ($37,068–$49,296)	96 (13.8)	81 (11.5)	100 (14.3)
Highest third (>$49,297)	585 (83.5)	589 (84.1)	556 (79.5)
Adjusted Clinical Group Risk Score (more co-morbidities lead to higher score, quartiles of *all* HealthPartners enrollees)			
1st quartile (< 0.29)	167 (23.9)	198 (28.3)	73 (10.4)
2nd quartile (0.29–0.68)	299 (42.7)	241 (34.4)	152 (21.7)
3rd quartile (0.69–1.55)	151 (21.6)	151 (21.6)	305 (43.6)
4th quartile (>1.56)	83 (11.9)	110 (15.7)	170 (24.3)

Table 2

Comparison of Costs Between Care Settings

	Care Setting						
	Retail Clinic	Physician Office		Urgent Care		Emergency Room	
	Cost per episode $ (95% CI)	Cost per episode $ (95% CI)	p-value (comparison to retail clinics)	Cost per episode $ (95% CI)	p-value (comparison to retail clinics)	Cost per episode $ (95% CI)	p-value (comparison to retail clinics)
	n=2100	n=6211		n=5880		n=979	
Total Costs	110 (97,123)	166 (162,170)	<0.001	156 (152,161)	<0.001	570 (540,602)	<0.001
Evaluation & Management Visit Costs	66 (63,69)	106 (103,108)	<0.001	103 (101,105)	<0.001	358 (345,370)	<0.001
Pharmacy Costs	21 (19,22)	21 (20,22)	0.65	22 (21,23)	0.27	26 (24,29)	<0.001
Laboratory & Radiology Test Costs	15 (12,17)	33 (32,35)	<0.001	27 (26,29)	<0.001	113 (98,128)	<0.001
Inpatient Costs	6 (0,17)	1 (0,3)	0.109	1 (0.3)	0.112	6 (0,13)	0.99
Other Costs	2 (1,4)	5 (4,6)	0.22	3 (2,5)	0.66	67 (54,81)	<0.001

*Average costs and confidence intervals presented in table are unadjusted. P-values presented in table account for matched analysis as described in methods.

Table 3

Comparison of Quality Between Care Settings

	Retail Clinic			Physician Office			Urgent Care			Emergency Department		
	Age Population Applicable	**Applicable Episodes**	**Pass Rate %**	**Applicable Episodes**	**Pass Rate %**	**p-value (vs. retail clinics)**	**Applicable Episodes**	**Pass Rate %**	**p-value (vs. retail clinics)**	**Applicable Episodes**	**Pass Rate %**	**p-value (vs. retail clinics)**
Otitis Media												
Duration of therapy for at least 10 days	2–5 yo	109	91.7	209	89.0	0.44	287	93.4	0.57	55	89.1	0.58
Follow-up within 8 weeks	2–12 yo	333	35.4	904	35.4	0.95	1003	35.1	0.90	154	35.7	0.96
Antibiotic prescribed is amoxicillin or augmentin	2–12 yo	225	76.9	656	77.7	0.79	752	74.7	0.52	89	77.5	0.91
If no antibiotics prescribed, seen in 48–72 hours after first appointment	2–12 yo	108	2.8	249	1.2	0.30	252	2.0	0.64	65	4.6	0.53
Received antibiotics at appointment*	2–12 yo	333	67.6	904	72.5	0.091	1003	74.9	0.010	154	57.8	0.034
Pharyngitis												
Culture or rapid strep test was obtained in diagnosis of GABHS (children)	< 18 yo	112	86.6	294	77.9	0.067	432	72.7	0.009	42	52.4	<0.001
Culture or rapid strep test was obtained in diagnosis of GABHS (adults)	≥18 yo	92	85.9	344	78.8	0.138	404	77.7	0.097	64	62.5	0.001
Received recommended antibiotics used to treat GABHS~	All patients	205	76.6	639	73.9	0.45	839	70.4	0.082	109	57.8	<0.001
Tetracycline or bactrim NOT used to treat GABHS	All patients	207	100.0	298	99.7	1.00#	392	99.5	1.00#	78	100.0	1.00#

		Retail Clinic		Physician Office			Urgent Care			Emergency Department		
	Age Population Applicable	**Applicable Episodes**	**Pass Rate %**	**Applicable Episodes**	**Pass Rate %**	**p-value (vs. retail clinics)**	**Applicable Episodes**	**Pass Rate %**	**p-value (vs. retail clinics)**	**Applicable Episodes**	**Pass Rate %**	**p-value (vs. retail clinics)**
Duration of therapy was at least 10 days for GABHS	All patients	207	63.3	298	64.8	0.74	392	65.1	0.65	78	28.2	<0.001
Among all episodes of pharyngitis, antibiotics prescribed*	All patients	680	26.0	1937	28.8	0.175	2018	36.3	<0.001	298	30.5	0.157
Urinary Tract Infection												
Urine culture obtained for all high risk patients&	18–65 yo	71	29.6	213	56.8	<0.001	117	58.1	<0.001	31	54.8	0.021
Antibiotics prescribed for 7 days or less for uncomplicated lower tract infections	18–65 yo	639	60.1	1850	57.1	0.184	1633	58.5	0.51	222	55.4	0.22
Antibiotics prescribed for at least 7 days for complicated lower tract infections: that is, those with: diabetes or structural anomaly of urinary tract	18–65 yo	23	52.2	87	32.6	0.096	50	56.0	0.76	9	88.9	0.089

Percentages presented in table are unadjusted. P-values presented are based on matched analysis as described in methods.

*Not included in aggregate quality scores

~Denominator are those with either (a) diagnosis of streptococcal pharyngitis or (b) pharyngitis and had an antibiotic prescribed

&High risk defined by 1) 3 or more UTI infections in past year, 2) diabetes, 3) immunocompromised state, 4) any structural or functional anomalies of urinary tract, 5) relapse of symptoms, or 6) a recent invasive procedure

#Indicator scores nearly identical across care settings and model did not converge. We therefore assigned p-value of 1.00

Table 4

Comparison between Care Settings of Preventive Services Received in 3 Months after Start of Episode

Preventive Service	Retail Clinic	Physician Office		Urgent Care		Emergency Department	
	Episodes where service provided %	Episodes where service provided %	p-value (comparison to retail clinics)	Episodes where service provided %	p-value (comparison to retail clinics)	Episodes where service provided %	p-value (comparison to retail clinics)
Applicable episodes*	n=2081	n=6022		n=5695		n=963	
Any Preventive Service	14.5	14.2	0.77	13.7	0.35	10.7	0.003
Preventive Exam	12.5	11.3	0.111	12.0	0.53	9.2	0.009
Pap Smear	6.3	6.7	0.46	6.3	0.89	4.3	0.047
Vaccination	4.7	5.6	0.117	4.6	0.82	3.5	0.151
Mammogram	1.9	1.8	0.91	1.8	0.76	0.6	0.020
Lipid Panel	0.8	0.9	0.82	0.8	0.75	0.0	0.91
Any Colon Cancer Screening	0.6	0.7	0.91	0.6	0.80	0.4	0.51

* Percentages presented in table are unadjusted. P-values presented are based on matched analysis as described in methods.