

# Preferences for and Experiences With Pill Appearance Changes: National Surveys of Patients and Pharmacists

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**M**edication nonadherence occurs when patients do not take their medication as prescribed. About 50% of patients with chronic diseases, such as high blood pressure, high cholesterol, and diabetes, are estimated to be nonadherent.<sup>1,2</sup> Nonadherence can result from factors related to the disease (eg, changes in cognition), medication (eg, adverse effects), patient (eg, forgetfulness), or health system (eg, high drug costs),<sup>3,5</sup> and it has been tied to poorer patient outcomes<sup>4</sup> and billions of dollars in US health care spending annually on hospitalizations and other costs associated with disease progression.<sup>6,7</sup>

One potential contributor to medication nonadherence is lack of consistency in the appearance of a patient's medication. The FDA requires that generic drugs—which currently comprise about 90% of dispensed prescriptions in the United States<sup>8</sup>—have the same dosage form, strength, route of administration, intended use, quality, and performance characteristics as their brand-name versions.<sup>9</sup> The FDA, however, does not mandate that generic drugs match their brand-name counterparts or each other in terms of physical appearance, including color, shape, size, and markings (text, lines, grooves, or designs). As a result, patients refilling a medication for a chronic disease may experience variations in their pills' appearance when the generic manufacturer supplying a drug to a pharmacy changes. One study found that 29% of patients initiating treatment with 1 of 4 classes of cardiovascular drugs after hospitalization for a myocardial infarction experienced a change in their pills' color or shape within 1 year.<sup>10</sup> Well-controlled observational analyses have found increased odds of patients stopping or delaying taking essential cardiovascular and antiepileptic drugs when experiencing such changes.<sup>10,11</sup>

Why patients might respond this way to changes in pill appearance is not known. To explore this question, we conducted national surveys of patients and pharmacists regarding their preferences for, experiences with, and perceptions and responses to changes in generic drug appearance.

## METHODS

We conducted 2 independent national surveys of patients and pharmacists with assistance from Nielsen Healthcare. The Office

## ABSTRACT

**OBJECTIVES:** To better understand patients' and pharmacists' preferences for and experiences with changes in pill appearance (size, shape, color, and markings).

**STUDY DESIGN:** Cross-sectional.

**METHODS:** We conducted independent national surveys of patients 50 years and older taking generic drugs for depression, diabetes, epilepsy, HIV, hyperlipidemia, or hypertension and of licensed pharmacists practicing in chain, franchise, or independent pharmacies. Responses were collected between January and April 2016.

**RESULTS:** Of 1000 patient respondents (30% response rate), most reported experiencing changes in pill appearance (51%) and preferred to be notified about them (82%), but less than half recalled being notified (verbally: 36%; via sticker: 45%). Among patients who reported experiencing a change, 12% reported stopping their medication or using it less frequently. Of 710 pharmacist respondents (33% response rate), many reported changes in pill appearance occurring frequently in their pharmacies (47% reported that changes occurred 6 or more times per month) and more than three-fourths reported notifying patients about them often (verbally: 88%; via sticker: 77%).

**CONCLUSIONS:** Our findings reveal opportunities to improve patients' experiences with pill appearance changes through better notification practices and patient education.

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of Management and Budget approved the study under the Paperwork Reduction Act of 1995, assigning it the control number 0910-0801. The Brigham and Women's Hospital Institutional Review Board also approved this study. All analyses were performed using SAS version 9.4 (SAS Institute).

### Patient Survey

**Design, population, and recruitment.** Eligibility for the patient survey was restricted to patients 50 years and older taking a generic medication for depression, diabetes, epilepsy, HIV, hyperlipidemia, or hypertension. These conditions were chosen to capture a wide range of chronic diseases. The age criterion was included to increase the likelihood that contacted individuals—recruited through phone sampling—would have 1 of the listed chronic diseases.<sup>12</sup>

A total of 16,243 landline and cell phone numbers were identified from Survey Sampling International's Directory Listed Household Sample and Wireless LITe database. From this sample, 6 pretests were conducted in January 2016 that resulted in minor modifications to the survey instrument, such as grammatical fixes and adjustments for clarity. Phone interviews took place between February and April 2016, lasted an average of 18 minutes, and concluded once the target of 1000 respondents was reached.

**Survey instrument development.** The patient survey was administered using a 56-question, closed-field instrument (eAppendices A and B [eAppendices available at [ajmc.com](http://ajmc.com)]). We first inquired about reliance on and preference for consistent pill appearance, asking patients whether they used pill appearance to make sure they took the correct medication and whether they preferred their pills to retain the same color, shape, size, or markings upon medication refill. We then asked patients how often they experienced a change in their pills' appearance, whether their pharmacist notified them about the change, and what their preference was for being notified when their pills' appearance changes. Other questions addressed patients' actions in response to changes in their pills' appearance. Finally, we collected information about patients' sex, age, race, education, income, and Census region. Reliance, preference, and perception questions were assessed using Likert scales.

### Pharmacist Survey

**Design, population, and recruitment.** The pharmacist survey targeted licensed pharmacists practicing in independent, franchise, and chain settings in the United States. We randomly selected 2161 practicing pharmacists believed to be practicing in such settings from a master file of more than 100,000 pharmacists in more than 50,000 pharmacies maintained by the data vendor SK&A. The number was chosen based on power calculations using simulated response distributions and an assumed 50% response rate.

Each selected pharmacist was sent a postcard alert and a survey mailing between January and April 2016 that included a paper survey,

## TAKEAWAY POINTS

Conducting separate national surveys of patients and pharmacists, we aimed to better understand their preferences for, experiences with, and responses to changes in generic drug appearance (size, shape, color, and markings).

- ▶ Most patients reported experiencing changes in pill appearance and preferred to be notified about them, but less than half recalled being notified. Among patients who reported experiencing a change, 12% stopped their medication or used it less frequently.
- ▶ Most pharmacists reported pill appearance changes occurring frequently in their pharmacies and notifying patients about them often.
- ▶ These findings reveal opportunities to improve patients' experiences with pill appearance changes through better notification practices and patient education.

a URL for optional online completion of the survey, a prepaid return envelope, and a \$5 cash honorarium. Nonresponders received a reminder letter and a second packet without the honorarium.

**Survey instrument development.** The pharmacist survey was self-administered using an instrument with 23 closed-field questions (eAppendices C and D). The survey was pretested in a convenience sample of 5 practicing pharmacists, with small adjustments made for question clarity based on their responses. We asked pharmacists about their perceptions of generic drug safety and effectiveness, followed by their preferences for consistent pill appearance. We then asked how frequently pharmacists observed generic pill appearance changes in their pharmacies and what they generally did to alert patients when such changes occurred. Other questions focused on reports that pharmacists received from patients in response to pill appearance changes, such as a belief that the wrong medication had been given. Finally, we collected information on pharmacists' sex, race, title, business type, number of years in practice, number of prescriptions filled per day, and source(s) of drug information. As with the patient survey, preference and perception questions were assessed using Likert scales.

### Statistical Analyses

**Patient survey.** The response rate for the patient survey was calculated using the American Association of Public Opinion Research's second standard definition.<sup>13</sup> Multivariable logistic regression modeling was used to examine predictors of patient preferences for pill appearance. For this model, a constructed outcome variable was derived based on the question of whether patients preferred the size, shape, color, or markings of their pills to remain the same, grouping patients who responded "definitely" or "probably" to any of these 4 questions vs patients who responded "no preference," "definitely not," or "probably not" to all questions. Multivariable logistic modeling was also used to examine predictors of patients who reported using a medication less frequently or stopping a medication following a pill appearance change. For each model, the covariates were sex, race (white/nonwhite), age (50-57, 58-65, ≥66 years), medical condition (hypertension, hyperlipidemia, diabetes, depression, epilepsy, HIV, multiple), region (East, Midwest,

**TABLE 1.** Survey Responder Demographics

Characteristics	Patient survey (N = 1000)		Pharmacist survey (N = 710)	
	n	%	n	%
Survey mode				
Landline	717	73	— <sup>a</sup>	—
Cell phone	267	27	— <sup>a</sup>	—
Online	— <sup>a</sup>	—	159	22
Mail	— <sup>a</sup>	—	551	78
Sex				
Male	388	39	369	53
Female	612	61	327	47
Age in years				
50-57	161	16	— <sup>a</sup>	—
58-65	270	27	— <sup>a</sup>	—
≥ 66	569	57	— <sup>a</sup>	—
Region				
East	177	18	— <sup>a</sup>	—
South	388	39	— <sup>a</sup>	—
Midwest	263	27	— <sup>a</sup>	—
West	165	17	— <sup>a</sup>	—
Race <sup>b</sup>				
White	794	79	557	80
Black	80	8	30	4
Hispanic	48	5	— <sup>a</sup>	—
Latino	— <sup>a</sup>	—	12	2
Asian	— <sup>a</sup>	—	77	11
Native American	— <sup>a</sup>	—	6	1
Other	78	8	11	2
Education				
Less than high school	33	3	— <sup>a</sup>	—
High school/ General Educational Development	273	28	— <sup>a</sup>	—
Some college	300	30	— <sup>a</sup>	—
4-year college degree	192	20	— <sup>a</sup>	—
Master's degree	141	14	— <sup>a</sup>	—
Advanced health-related degree	29	3	— <sup>a</sup>	—
Advanced non-health-related degree	19	2	— <sup>a</sup>	—
Income				
< \$15,000	80	10	— <sup>a</sup>	—
\$15,000-< \$35,000	170	21	— <sup>a</sup>	—
\$35,000-< \$50,000	160	20	— <sup>a</sup>	—
\$50,000-< \$75,000	173	21	— <sup>a</sup>	—
\$75,000-< \$100,000	97	12	— <sup>a</sup>	—
≥ \$100,000	136	17	— <sup>a</sup>	—
Medical condition <sup>b</sup>				
Epilepsy or seizure disorder	31	3	— <sup>a</sup>	—
Diabetes	268	27	— <sup>a</sup>	—
Hypertension	596	60	— <sup>a</sup>	—
Hyperlipidemia	565	57	— <sup>a</sup>	—
Depression	238	24	— <sup>a</sup>	—
HIV	2	0.2	— <sup>a</sup>	—

(continued)

South, West), education (high school, college, graduate), and income (< \$50,000, \$50,000-< \$100,000, ≥ \$100,000).

**Pharmacist survey.** Multivariable ordinal logistic regression modeling was used to examine predictors of pharmacist preferences for generic pill appearance consistency, grouping pharmacists who responded “much prefer” or “somewhat prefer,” “no preference,” and “somewhat not prefer” or “much not prefer.” The frequency of observing generic pill appearance changes, frequency of being notified about generic pill appearance changes, likelihood of notifying patients verbally in person or on the phone about pill appearance changes, and likelihood of notifying patients via sticker on the pill bottle about pill appearance changes were also modeled using ordinal logistic regression but without any grouping of response categories. Covariates in the models were pharmacy type (chain, nonchain), years in practice (continuous), position (owner/chief pharmacist, staff/other), and pharmacy prescription dispensing volume (≤ 200 prescriptions per day, > 200 prescriptions per day).

## RESULTS

A total of 1000 patients (30% response rate) and 710 pharmacists (33% response rate) completed the surveys (Table 1). Of the patient respondents, 61% were women, 79% were white, and 57% were 66 years or older. Of the pharmacist respondents, 47% were women, 80% were white, and 56% identified as a staff pharmacist. These percentages are comparable with those nationally.<sup>14,15</sup> About half of respondents filled more than 200 prescriptions per day (52%), and about one-third practiced in an independent pharmacy (38%) and reported practicing for 30 years or longer (34%). Although we targeted pharmacists in independent, franchise, and chain settings, 10% of respondents reported practicing in other settings, most often hospital-associated outpatient pharmacies.

### Patients' and Pharmacists' Pill Appearance Preferences

Most patients preferred to have a consistent pill appearance. More than half of patients “definitely” or “probably” preferred their prescription refills to have the same color (63%), size (68%), shape (63%), and markings (55%) (Table 2). In multivariable modeling, only race was associated with a preference for consistent pill appearance (Table 3). Nonwhite patients were more likely to prefer consistent pill appearance (odds ratio [OR], 2.58; 95% CI, 1.52-4.38).

In contrast with patients, most pharmacists (54%) had no preference for consistent pill appearance of generic drugs when dispensing, and 12% preferred not to dispense generic drugs with the same appearance (Table 2). Multivariable analysis revealed that pharmacists who reported practicing for fewer years were more likely to prefer pill appearance consistency (OR per 10 years of practice, 0.78; 95% CI, 0.69-0.88) (Table 4).

### Frequency of Pill Appearance Changes

About half of patients (51%) reported receiving a prescription refill in which their pills' appearance changed in the last year and, of those

**TABLE 1.** (Continued) Survey Responder Demographics

Characteristics	Patient survey (N = 1000)		Pharmacist survey (N = 710)	
	n	%	n	%
How many people aged 18 or older live in your household?				
1	397	40	— <sup>a</sup>	—
2	431	44	— <sup>a</sup>	—
≥3	157	16	— <sup>a</sup>	—
Pharmacy type				
Independent	— <sup>a</sup>	—	261	38
Regional chain	— <sup>a</sup>	—	118	17
National chain	— <sup>a</sup>	—	242	35
Franchise	— <sup>a</sup>	—	5	0.7
Other	— <sup>a</sup>	—	69	10
Business type				
Stand-alone	— <sup>a</sup>	—	325	48
Supermarket-based	— <sup>a</sup>	—	118	17
Pharmacy chain	— <sup>a</sup>	—	180	26
Large store-based	— <sup>a</sup>	—	62	9
Title				
Chief pharmacist	— <sup>a</sup>	—	135	19
Owner/chief pharmacist	— <sup>a</sup>	—	120	17
Owner/pharmacist	— <sup>a</sup>	—	31	4
Staff pharmacist	— <sup>a</sup>	—	390	56
Other	— <sup>a</sup>	—	22	3
Years in practice				
Mean (SD)	— <sup>a</sup>	—	22 (13)	
0-9	— <sup>a</sup>	—	148	22
10-19	— <sup>a</sup>	—	166	24
20-29	— <sup>a</sup>	—	140	20
≥30	— <sup>a</sup>	—	233	34
Number of prescriptions filled per day				
< 100	— <sup>a</sup>	—	63	9
100-200	— <sup>a</sup>	—	269	39
201-300	— <sup>a</sup>	—	165	24
> 300	— <sup>a</sup>	—	199	29
From what source(s) do you learn about a drug's safety and effectiveness? <sup>b</sup>				
Continuing education requirements	— <sup>a</sup>	—	659	94
Visit from pharmaceutical representative	— <sup>a</sup>	—	275	39
Literature from a payer formulary committee	— <sup>a</sup>	—	50	7
Pharmacy or professional journals	— <sup>a</sup>	—	538	77
Package inserts	— <sup>a</sup>	—	464	66
Text or reference books	— <sup>a</sup>	—	321	54
Physicians	— <sup>a</sup>	—	62	9
Pharmacist colleagues	— <sup>a</sup>	—	314	45
Patient	— <sup>a</sup>	—	101	15

<sup>a</sup>Not asked.

<sup>b</sup>Multiple responses accepted.

**TABLE 2.** Featured Survey Questions and Responses

A. Patient survey questions		Responses (N = 1000)		
Patient survey questions			n	%
In the last year, have you received a prescription refill in which the pills differed in appearance from the previous prescription or refill you received?				
Yes			514	51
In the last year, how often did you receive a prescription refill in which the pills differed in appearance from the previous prescription or refill you received? <sup>a</sup>				
4 or more times			49	10
2-3 times			220	43
1 time			227	45
Never			12	2
How much do you prefer for the pills in the refill to have the same...?				
Color				
Definitely or probably prefer			634	63
No preference, probably not, or definitely not prefer			362	36
Shape				
Definitely or probably prefer			627	63
No preference, probably not, or definitely not prefer			370	37
Size				
Definitely or probably prefer			678	68
No preference, probably not, or definitely not prefer			318	32
Markings				
Definitely or probably prefer			546	55
No preference, probably not, or definitely not prefer			439	44
As best you recall, did your pill change in...? <sup>a,b</sup>				
Color			310	68
Shape			212	46
Size			192	42
Any markings			91	20
In the future, if your pill appearance changes from one refill to another, which of the following best describes what you'd think? Would you...?				
Definitely like to be notified			656	66
Probably like to be notified			156	16
Probably not like to be notified			21	2
Definitely not like to be notified			8	0.8
No preference			157	16
If your pharmacy notified you about the pill appearance change, how would you prefer to be notified? <sup>a</sup>				
Verbally, in person or on the phone			439	45
Using a sticker on the prescription bottle			345	36
No preference			184	19
When your pill changed in appearance, as best you recall, did your pharmacist...? <sup>a</sup>				
Talk to you about the change, in person or on the phone			176	36
Put a sticker on the pill bottle to let you know about the change			201	45

(continued)

**TABLE 2.** (Continued) Featured Survey Questions and Responses

A. Patient survey questions (continued)		
Patient survey questions	Responses (N = 1000)	
	n	%
When your pill changed in appearance, as best you recall, did you...? <sup>a</sup>		
Think the pill you got was the same as before	350	72
Think you got the wrong pill	143	29
Ask your pharmacist about the new pill's appearance	175	35
Did your pharmacist relieve your concerns about the new pill's appearance? <sup>a</sup>		
Yes	167	97
Did your physician or prescriber relieve your concerns about the new pill's appearance? <sup>a</sup>		
Yes	37	84
Thinking back again to the last time you refilled a medication you had been taking and it changed in appearance, did you...? <sup>a</sup>		
Search the internet to figure out the identity of the new pill	52	10
Not take the pill home, or try to return it to the pharmacy after taking it home	19	4
Have concerns that the new pill would not work as well as the pill you were taking	82	17
Have concerns that the new pill would cause more side effects than the pill you were taking	48	10
Use the pill less frequently	42	8
Stop using the pill	19	4
Switch back to the prior pill version	61	12
B. Pharmacist survey questions		
Pharmacist survey questions	Responses (N = 710)	
	n	%
Which of the following best describes your preference as to the same appearance of the generic pills you dispense?		
Much prefer	129	19
Somewhat prefer	108	16
No preference	369	54
Somewhat not prefer	34	5
Much not prefer	45	7
Approximately how many times in an average month do you notice that your pharmacy has changed the manufacture to one that has a different appearance?		
0-1	105	15
2-5	267	38
6-15	172	25
> 15	152	22

(continued)

patients, about half (53%) reported that it happened 2 or more times (Table 2). Patients reported that pill color was the characteristic that changed most frequently (68%), followed by shape (46%), size (42%), and markings (20%).

More than four-fifths of pharmacists reported that their pharmacy changed generic drug manufacturers with resulting changes in

**TABLE 2.** (Continued) Featured Survey Questions and Responses

B. Pharmacist survey questions (continued)		
Pharmacist survey questions	Responses (N = 710)	
	n	%
How often are you personally alerted when your pharmacy, distributor, or wholesaler changes suppliers for the generic pills it carries to one that has a different appearance?		
Almost always	123	18
Commonly	99	14
Occasionally	88	13
Rarely	197	28
Never	192	28
Considering instances when you refill a prescription with a pill that differs in appearance from the prior prescription without having changed the drug or dose, please indicate how often you do each of the following:		
Notify the patient verbally, in person or on the phone		
Almost always	321	47
Commonly	207	30
Occasionally	86	13
Rarely	54	8
Never	23	3
Notify the patient using a sticker on a prescription bottle		
Almost always	507	73
Commonly	106	15
Occasionally	26	4
Rarely	20	3
Never	35	5
Log an incident report with the pharmacy when a patient complains about a change in pill appearance		
Almost always	14	2
Commonly	26	4
Occasionally	60	9
Rarely	213	31
Never	375	55
Leave a special note in the patient pharmacy record indicating that the change occurred		
Almost always	86	13
Commonly	86	13
Occasionally	98	14
Rarely	183	27
Never	238	34

<sup>a</sup>Asked only of a subset of respondents.

<sup>b</sup>Multiple responses accepted.

pill appearance at least twice per month: never or once per month (15%), 2 to 5 times per month (38%), 6 to 15 times per month (25%), and more than 15 times per month (22%) (Table 2). In multivariable modeling, chain/franchise pharmacies were more likely than independent pharmacies to experience such changes (OR, 1.57; 95% CI, 1.11–2.22) (Table 4).

**Notification of Pill Appearance Changes**

A majority of pharmacists reported that they were either “never” (28%) or “rarely” (28%) alerted when their pharmacy, distributor, or wholesaler changed suppliers for generic pills with a different appearance (Table 2). In multivariable modeling, only pharmacy type was associated with such notification, with pharmacists working at a chain/franchise pharmacy having a greater likelihood than pharmacists in independent pharmacies of being alerted when pill appearance changes occur (OR, 1.62; 95% CI, 1.15-2.27) (Table 4).

**Patient and Pharmacist Notification Preferences, Experiences, and Practices**

Patients overwhelmingly reported that they “definitely” (66%) or “probably” (16%) desired to be notified of a change in their pills’ appearance by their pharmacist and that they preferred being notified verbally (45%) over a sticker on the prescription bottle (36%) (Table 2). Among patients reporting experiencing a change in pill appearance during the prior year, 36% reported that pharmacists notified them about the change verbally, whereas 45% reported being notified with a sticker on the bottle.

When pharmacists were asked about their notification practices when pill appearance changed, most pharmacists reported that they “almost always” (47%) or “commonly” (30%) notified patients verbally (Table 2). A large majority of pharmacists also reported that they “almost always” (73%) or “commonly” (15%) notified patients using a sticker on the prescription bottle. Most pharmacists reported “never” (55%) logging an incident report when a patient complained about a change in pill appearance and “rarely” (27%) or “never” (34%) leaving a note in the patient’s pharmacy record indicating that a change occurred. Multivariable analysis revealed that pharmacists working in pharmacies filling more than 200 prescriptions per day were more likely to notify patients about a change in pill appearance verbally (OR, 1.78; 95% CI, 1.34-2.38) and via a sticker on the pill bottle (OR, 1.65; 95% CI, 1.17-2.33) (Table 4).

**Patient Responses to and Beliefs About Pill Appearance Changes**

Among patients reporting that they experienced a pill appearance change, almost one-third (29%) reported thinking that they received

the wrong pill (Table 2). About 1 in 8 patients reported changing their medication use, either using the pills less frequently (8%) or stopping their use completely (4%). Multivariable analysis found that nonwhite patients were more likely than white patients to use their pills less frequently or stop completely when they experienced a change in their pills’ appearance (OR, 2.89; 95% CI, 1.42-5.85) (Table 3).

**TABLE 3.** Association Between Demographics and Outcomes in Patient Survey<sup>a</sup>

	Any preference for pill appearance consistency <sup>b</sup>		Likelihood that a patient used the pills less frequently or stopped using them when the pills’ appearance changed	
	OR	[95% CI]	OR	[95% CI]
<b>Gender</b>				
Female	Ref		Ref	
Male	0.78	0.55-1.12	1.56	0.79-3.05
<b>Age in years</b>				
≥ 66	Ref		Ref	
58-65	0.68	0.46-1.00	1.39	0.64-3.03
50-57	0.82	0.51-1.31	1.35	0.56-3.24
<b>Region</b>				
West	Ref		Ref	
East	0.94	0.51-1.71	0.68	0.21-2.23
Midwest	0.74	0.43-1.28	0.73	0.26-2.03
South	0.75	0.45-1.25	1.11	0.47-2.64
<b>Race</b>				
White	Ref		Ref	
Nonwhite	<b>2.58</b>	<b>1.52-4.38</b>	<b>2.89</b>	<b>1.42-5.85</b>
<b>Education</b>				
Graduate degree	Ref		Ref	
College/some college	0.90	0.57-1.44	0.39	0.16-0.97
High school/less	1.29	0.74-2.27	0.78	0.29-2.11
<b>Medical condition</b>				
Hypertension	Ref		Ref	
Depression	1.43	0.66-3.10	1.20	0.30-4.86
Diabetes	0.94	0.41-2.12	2.01	0.51-7.89
Epilepsy	0.92	0.17-5.08	– <sup>c</sup>	–
HIV	– <sup>d</sup>	–	– <sup>d</sup>	–
Hyperlipidemia	0.92	0.53-1.61	0.24	0.03-2.19
Multiple	1.21	0.76-1.93	1.08	0.42-2.76
<b>Income</b>				
< \$50,000	Ref		Ref	
\$50,000-< \$100,000	1.02	0.68-1.54	0.79	0.35-1.78
≥ \$100,000	0.66	0.40-1.09	0.85	0.27-2.62

OR, odds ratio; ref, reference group.

<sup>a</sup>Bold text indicates *P* < .05.

<sup>b</sup>Patients were grouped as preferring pill appearance consistency if they answered “definitely would prefer” or “probably would prefer” for any pill characteristic (color, shape, size, and/or markings).

<sup>c</sup>The 9 patients taking generic medication for epilepsy alone responded “no” to whether they stopped their medication or took it less frequently in response to an appearance change.

<sup>d</sup>The 2 respondents taking a generic medication for HIV were also taking a generic medication for another assessed condition.

**TABLE 4.** Association Between Demographics and Outcomes in Pharmacist Survey<sup>a</sup>

	Preference for pill appearance consistency <sup>b</sup>		Increased frequency for changing manufacturers resulting in different pill appearance		Likelihood of being personally alerted when pill appearance changes occur		Likelihood of action performed when refilling a prescription where pill appearance changed			
							Notify the patient verbally		Notify the patient using a sticker on the bottle	
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)		
Number of years in practice (per 10 years)	<b>0.78</b>	<b>[0.69-0.88]</b>	1.09	[0.98-1.23]	<b>0.88</b>	<b>[0.78-0.98]</b>	0.90	[0.79-1.00]	1.01	[0.88-1.16]
Pharmacy type										
Independent/other	Ref		Ref		Ref		Ref		Ref	
Chain/franchise	0.93	[0.64-1.36]	<b>1.57</b>	<b>[1.11-2.22]</b>	<b>1.62</b>	<b>[1.15-2.27]</b>	0.73	[0.51-1.04]	1.06	[0.69-1.62]
Number of prescriptions filled per day										
< 200	Ref		Ref		Ref		Ref		Ref	
≥ 200	1.08	[0.80-1.46]	1.01	[0.76-1.33]	0.94	[0.72-1.24]	<b>1.78</b>	<b>[1.34-2.38]</b>	<b>1.65</b>	<b>[1.17-2.33]</b>
Title										
Staff/other	Ref		Ref		Ref		Ref		Ref	
Owner/chief	0.86	[0.59-1.24]	1.40	[1.00-1.97]	1.30	[0.93-1.81]	1.02	[0.72-1.46]	1.11	[0.73-1.69]

OR, odds ratio; ref, reference group

<sup>a</sup>Bold text indicates *P* < .05.

<sup>b</sup>Pharmacists were categorized as having preference for pill appearance consistency if they answered “much prefer” or “somewhat prefer.”

Other actions that patients reported taking in response to a change in their medication’s appearance included asking their pharmacist (35%) or physician (9%) about the change (Table 3). Of those patients who reported asking their pharmacist or physician, 97% reported that their pharmacists alleviated their concerns, and 84% reported that their physician alleviated their concerns.

## DISCUSSION

In national surveys, we found that most patients preferred the appearance of their generic pills to remain the same, with some patients reporting using their medication less frequently or stopping it completely when such change occurred. Pharmacists reported that changes in generic pill appearance happened frequently in their practice, but that they were often not alerted when such changes occurred. Far more pharmacists reported notifying patients about generic pill appearance changes, either verbally or with a sticker on the bottle, than patients recalled being notified by pharmacists.

Our patient findings align well with those of a separate survey we conducted of commercially insured patients taking generic medication indicated for 1 of 4 chronic diseases (depression, epilepsy, hyperlipidemia, and hypertension) who had recently experienced a change in the appearance of their pills.<sup>16</sup> In this study, most respondents also reported wanting their pills to remain the same color (72%), size (75%), and shape (71%). Similarly, more than three-fourths of respondents (86%) also reported wanting to be notified when their pills changed appearance, and a minority likewise recalled their pharmacist informing them of the change (verbal: 19%; via a sticker on the pill bottle: 30%). Finally, the same

percentage of respondents (8%) reported adjusting their medication use following the change. Combined, these findings suggest that many patients rely on pill appearance to make sure they are taking the correct medication and that changes in appearance may cause confusion, prompting some patients to stop taking their medication. This may be particularly important among elderly patients taking multiple medications for chronic diseases. We are unaware of prior published surveys about the preferences of and experiences with pill appearance changes among pharmacists.

Our study reveals opportunities to improve patient and pharmacist experiences when pill appearance changes: through patient education about the potential for pill appearance changes for generic medication, along with better notification practices and knowledge transfer when such changes occur. Because many pharmacists reported rarely or never being alerted of such changes, creation and widescale adoption of an automated point-of-dispensing system that alerts pharmacists when a patient’s generic pill has changed appearance and indicates what that change is (eg, size, shape, color, and/or markings) would be helpful.

The observed disconnect between pharmacists reporting notifying patients about generic pill appearance changes and patients reporting not recalling being notified, meanwhile, suggests that the mode of communication between pharmacists and patients is important. Pharmacists most commonly reported notifying patients using a sticker on the bottle regardless of their practice type. Patients, however, reported preferring a verbal notification and may not have looked closely at their pill bottles.

Finally, some patients—notably, nonwhite patients—were more likely to report using their medication less frequently or stopping

completely when a generic pill appearance change occurred. It is unclear why this may be the case, highlighting an avenue for further investigation in addition to populations for targeted intervention.

### Limitations and Strengths

There are limitations to our study relevant to the disconnect identified between patients and pharmacists. The surveys were conducted independently, meaning that the patients surveyed did not receive prescriptions dispensed by the pharmacists surveyed. Like all surveys, our study was also subject to possible participation, recall, and response biases. Patients who were counseled by their pharmacist may have misremembered the conversation, and patients who had issues with changes in their pills' appearance may have been more likely to participate. Similarly, patients with HIV may have been reluctant to report having the condition. Survey questions for patients and pharmacists, meanwhile, were not phrased identically and may have been interpreted differently. For example, patients may have interpreted the question "When your pill changed in appearance, as best you recall, did your pharmacist talk to you about the change, in person or on the phone?" literally, thinking that if someone other than the pharmacist (eg, pharmacy technician) talked to them, then they were not notified. By contrast, pharmacists may have had a more general interpretation of their question asking about prescription refill practices when pill appearance changes, thinking that if a member of the pharmacy team, such as a pharmacy intern, counseled the patient, then that was sufficient and reported accordingly.

Additional limitations to our study warrant noting. First, our patient findings were limited to older patients with 6 specific chronic conditions and may not be generalizable to younger patients or those with other diseases. Second, given our response rates and sampling frames, it is possible that our results are not generalizable to all segments of the target populations. Third, our surveys were designed to explore experiences with changes in pill appearance but could not assess the clinical appropriateness of the change. Finally, our ascertainment of patient sex based on voice could have been inaccurate.

There were also several strengths to our investigation. Both patients and pharmacists were surveyed—as opposed to one group or the other—about similar topics. The surveys were national in scope, and the number of respondents for both was large.

## CONCLUSIONS

Our study indicates that most patients report not being notified when they experience changes in pill appearance during a medication refill even though pharmacists report that these changes happen frequently in the pharmacy. A disconnect exists between patients' reported experiences and pharmacists' reported practices regarding notification when that change does occur, with some patients altering their medication use in response. Improving patient education about potential pill appearance changes and notification practices

around the time such changes occur may improve the experiences of both patients and pharmacists. ■

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**eAppendix A. Patient Survey Instrument**

\_\_\_\_\_ : \_\_\_\_\_

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**SUBJECTS FOR QUESTIONNAIRE:**

SECTION 100: SAMPLE PRELOADS AND SCREENING

SECTION 200: PILL APPEARANCE PREFERENCES AND PERCEPTIONS

SECTION 300: PILL APPEARANCE CHANGES

SECTION 400: GENERAL QUESTIONS ABOUT BRAND-NAME AND GENERIC DRUGS

SECTION 500: DEMOGRAPHICS

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According to the \_\_\_\_\_, an \_\_\_\_\_ may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid \_\_\_\_\_ number. The valid \_\_\_\_\_ for this information collection is \_\_\_\_\_. The time required to complete this information collection is estimated to average 10-20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

<b>SECTION 100: SAMPLE PRELOAD AND SCREENING QUESTIONS</b>
--

**BASE: ALL RESPONDENTS**

**Q100 PRE-TEST/MAIN - PRELOAD**

1 Pre-test

2 Main

**BASE: ALL RESPONDENTS**

**Q101 TYPE OF PHONE - PRELOAD**

1 Landline

2 Cell phone

**BASE: ALL RESPONDENTS**

**Q105** Hello, this is \_\_\_\_\_ from Nielsen Healthcare, a national research firm. We are conducting a survey about prescription medications. We are working with a team of physicians at \_\_\_\_\_. Your participation is voluntary. Your survey responses will be used for research purposes, and will not be combined with any personal information in reports to our clients. Is now a good time for you to answer some questions?

(IF NEEDED: The survey takes approximately 10-20 minutes, depending on your responses.)

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

- 1 Yes [GO TO Q115]
- 2 No (ASK IF SOMEONE ELSE IN HH CAN ANSWER)
  
- 8 Not sure (VOL)
- 9 Decline to answer (VOL) (INT: SCHEDULE CALL BACK) [TERM]

**BASE: ALL RESPONDENTS**

Q115 DO NOT ASK, RECORD FROM VOICE.

- 1 Male
- 2 Female

**BASE: ALL CONTINUING RESPONDENTS**

Q120 Which of the following describes your age? (INTERVIEWER: READ LIST UNTIL RESPONSE IS GIVEN)

- 1 25 or under
- 2 26-33
- 3 34-41
- 4 42-49
- 5 50-57
- 6 58-65
- 7 66 and above
- 8 Not sure (VOL)
- 9 Decline to answer (VOL)

**BASE: AGE 50+ (Q120/5,6,7)**

Q135 Do you take generic medications for the following conditions?

**Q136**

- 1 Yes
- 2 No
- 8 Not sure (VOL)
- 9 Decline to answer (VOL)
  
- 1 Epilepsy or seizure disorder
- 2 Diabetes
- 3 Hypertension
- 4 Hyperlipidemia or high cholesterol
- 5 Depression
- 6 HIV

**BASE: ALL RESPONDENTS**

Q165 QUALIFICATION STATUS (DOES NOT APPEAR ON SCREEN)

[PN: IF AGE 50 OR OLDER (Q120/5,6,7) AND TAKES GENERIC DRUGS FOR EPILEPSY OR DIABETES OR HYPERTENSION OR HYPERLIPIDEMIA OR DEPRESSION OR HIV (Q135/1-6 AND Q136/1), GET CODE 1.

ALL OTHERS, GET CODE 2.

[RESEARCHER/FIELD MANAGER NOTE: SUSPEND FIELD AFTER 250 NON-QUAL COMPLETES SO WE CAN WEIGHT THE DATA AND, IF ALL IS WELL, WE CAN RE-ROUTE NON-QUALS SO THEY NO LONGER HAVE TO BE ASKED DEMO Q'S.]

- 1 QUALIFIED (QUOTA=1000)
- 2 NOT QUALIFIED

## SECTION 200: PILL APPEARANCE PREFERENCES AND PERCEPTIONS

### BASE: ALL QUALIFIED RESPONDENTS

**Q205** We are working with teams at \_\_\_\_\_. The goal is to learn about your views on how your prescription drugs look. This survey will help guide future work aimed at promoting positive health outcomes among patients like you. Your answers will be confidential and grouped with hundreds of other people's answers so there is no possibility of identifying you.

Before we begin, I would like to mention that there are two types of prescription drugs: 1) brand-name drugs, and 2) generic drugs. A **brand-name** drug is made by a single company, usually the first to sell the drug. After the company's patent on the brand-name drug runs out, other companies can make and sell the drug; this is called the **generic** version of the drug. Generic drugs typically look different from the brand-name version. Generic versions of the same drug from different manufacturers can look different from each other. These differences in **appearance** can include pill **color, shape, size, and any markings (such as text, lines, grooves, or designs)** printed on the pill. This survey is about these differences. Note: When I say the word "pill" in this survey, I mean drugs like capsules or tablets.

### BASE: ALL QUALIFIED RESPONDENTS

**Q210** The first series of questions has to do with pill **appearance**. Appearance includes the pill's **color, shape, size, and any markings (such as text, lines, grooves, or designs)** printed on the pill.

Thinking about the last year, which of the following best describes how pill appearance relates to your medication use for [INSERT Q135/1-6 AND Q135/1 RESPONSE(S). IF MORE THAN ONE CONDITION INSERTED, BE SURE TO INCLUDE "AND" BEFORE THE LAST ITEM.]? Do you...? (INTERVIEWER: READ LIST)

- 1 Always rely on pill appearance to make sure you take the correct medication
- 2 Usually rely on pill appearance to make sure you take the correct medication
- 3 Rarely rely on pill appearance to make sure you take the correct medication
- 4 Never rely on pill appearance to make sure you take the correct medication

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

- 8 Don't know or don't recall (VOL)
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q213** In the last year, have you received a prescription refill in which the pills differed in **appearance** from the previous prescription or refill you received? (INTERVIEWER: READ LIST)

- 1 Yes
- 2 No
- 8 Don't know or don't recall (VOL)
- 9 Decline to answer (VOL)

**BASE: REFILL DIFFERED IN APPEARANCE (Q213/1)**

**Q215** In the last year, how often did you receive a prescription refill in which the pills differed in **appearance** from the previous prescription or refill you received? (INTERVIEWER: READ LIST)

- 1 4 or more times
- 2 2-3 times
- 3 1 time
- 4 Never
- 8 Don't know or don't recall (VOL)
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q220** Do you associate the appearance of your pills with the drug company making them (for example: 'because this pill is green, I know it is from Merck')? (INTERVIEWER: READ LIST)

- 1 Yes
- 2 No
- 8 Not sure
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q225** Imagine you were ready for a normal refill of a prescription drug you had been on for a long time. How much would you prefer for the pills in the refill to have the same...?

- 1 Definitely would prefer
- 2 Probably would prefer
- 3 Have no preference
- 4 Probably would not prefer
- 5 Definitely would not prefer
- 8 Not sure/Don't know
- 9 Decline to answer (VOL)

- 1 Color as usual
- 2 Shape as usual
- 3 Size as usual
- 4 Pill markings as usual

**BASE: PILL DIFFERED IN APPEARANCE FROM PRIOR PRESCRIPTION (Q215/1,2,3,8,9)**

**Q230** In the past year, when one of your pills changed in **appearance** from one refill to another, did you think that change meant that a different manufacturer was making the pill?  
(INTERVIEWER: READ LIST)

- 1 Yes
- 2 No
- 8 Not sure
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q235** In the future, if your pill **appearance** changes from one refill to another, which of the following best describes what you'd think? Would you...? (INTERVIEWER: READ LIST)

- 1 Definitely like to be notified of this change by the pharmacy
- 2 Probably like to be notified of this change by the pharmacy
- 3 Probably not like to be notified of this change by the pharmacy
- 4 Definitely not like to be notified of this change by the pharmacy
- 5 Have no preference to be notified of this change by the pharmacy
- 8 Not sure/Don't know (VOL)
- 9 Decline to answer (VOL)

**BASE: PROBABLY/DEFINITELY WOULD/HAVE NO PREFERENCE (Q235/1,2,5)**

**Q236** If your pharmacy notified you about the pill appearance change, how would you prefer to be notified? (INTERVIEWER: READ LIST)

- 1 Verbally, in person or on the phone
- 2 Using a sticker on the prescription bottle
- 3 No preference
- 8 Not sure/Don't know (VOL)
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q240** Do you think that if your generic pill changed in its **appearance** during a routine refill that the new pill would be less **effective**? (INTERVIEWER: READ LIST)

- 1 Yes
- 2 No
- 8 Not sure
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q245** Do you think that if your generic pill changed in its **appearance** during a routine refill that the new pill would be less **safe**? (INTERVIEWER: READ LIST)

- 1 Yes
- 2 No
- 8 Not sure
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q260** Assume that generic pill A costs you \$5 per month. It would cost the manufacturers an extra \$1 per month to ensure that the appearance of generic pill A remains constant every time you refill it. Would you pay \$6 per month for generic pill A to ensure that your pill has the same size, shape, and color at each refill? (INTERVIEWER: READ LIST)

- 1 Yes
- 2 No
- 8 Not sure
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q250** Assume that generic pill B costs you \$10 per month. It would cost the manufacturers an extra \$5 per month to ensure that the appearance of generic pill B remains constant every time you refill it. Would you pay \$15 per month for generic pill B to ensure that your pill has the same size, shape, and color at each refill? (INTERVIEWER: READ LIST)

- 1 Yes
- 2 No
- 8 Not sure
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q255** Assume that generic pill C costs you \$15 per month. It would cost the manufacturers an extra \$10 per month to ensure that the appearance of generic pill C remains constant every time you refill it. Would you pay \$25 per month for generic pill C to ensure that your pill has the same size, shape, and color at each refill? (INTERVIEWER: READ LIST)

- 1 Yes
- 2 No
- 8 Not sure
- 9 Decline to answer (VOL)

**SECTION 300: PILL APPEARANCE CHANGES**

**BASE: PILL DIFFERED IN APPEARANCE FROM PRIOR PRESCRIPTION**

**(Q215/1,2,3,8,9)**

**Q305** The next series of questions is about a pill's appearance. First, I'd like to remind you that pill **appearance** includes the pill's **color, shape, size, and any markings (such as text, lines, grooves, or designs)** printed on the pill.

Please think back to the last time you refilled a medication you had been taking regularly and, during a routine refill, it changed in **appearance**.

What was the name of the drug? (INTERVIEWER: PROBE IF NECESSARY)

[TEXT BOX]

- 8 Not sure (VOL)
- 9 Decline to answer (VOL)

**BASE: PILL DIFFERED IN APPEARANCE FROM PRIOR PRESCRIPTION**

**(Q215/1,2,3,8,9)**

**Q315** Approximately how long ago was the change in appearance? (INTERVIEWER: PROBE IF NECESSARY. ALLOW RESPONDENTS TO ANSWER IN YEARS OR WEEKS OR MONTHS OR ALL 3)

[PN: ALLOW RESPONDENTS TO ANSWER IN YEARS OR WEEKS OR MONTHS OR ALL 3.]

[RANGE: 0-x]      [RANGE: 0-x]      [RANGE: 0-x]  
|\_|\_| years      |\_|\_| months      |\_|\_| weeks

- 8 Not sure (VOL)
- 9 Decline to answer (VOL)

**BASE: PILL DIFFERED IN APPEARANCE FROM PRIOR PRESCRIPTION**

**(Q215/1,2,3,8,9)**

**Q325** As best you recall, did your pill change in...? (INTERVIEWER: READ LIST)

[MULTIPLE RESPONSE]

- 1 Color
- 2 Shape
- 3 Size
- 4 Any markings (such as text, lines, grooves, or designs) printed on the pill
- 8 Not sure (VOL)      EXCLUSIVE
- 9 Decline to answer (VOL)      EXCLUSIVE

**BASE: PILL DIFFERED IN APPEARANCE FROM PRIOR PRESCRIPTION**

**(Q215/1,2,3,8,9)**

**Q330** When your pill changed in appearance, as best you recall, did **your pharmacist**...?

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

- 1 Yes
- 2 No
- 3 Don't recall (VOL)
- 9 Decline to answer (VOL)

- 1 Talk to you about the change, in person or on the phone
- 2 Put a sticker on the pill bottle to let you know about the change

**BASE: PILL DIFFERED IN APPEARANCE FROM PRIOR PRESCRIPTION (Q215/1,2,3,8,9)**

**Q335** When your pill changed in appearance, as best you recall, did you...?

**Q336**

- 1 Yes
- 2 No
- 3 Don't recall (VOL)
- 9 Decline to answer (VOL)

[PN: DO NOT ALLOW THE SAME Q336/1,2 RESPONSE FOR BOTH Q335/1 AND 2]

- 1 Think the pill you got was the same as before, even though it looked different
- 2 Think you got the wrong pill
- 3 Ask your pharmacist about the new pill's appearance

**BASE: ASKED PHARMACIST ABOUT NEW PILL'S APPEARANCE (Q335/3 AND Q336/1)**

**Q340** Did your pharmacist relieve your concerns about the new pill's appearance?

- 1 Yes
- 2 No
- 3 Don't recall (VOL)
- 9 Decline to answer (VOL)

**BASE: PILL DIFFERED IN APPEARANCE FROM PRIOR PRESCRIPTION (Q215/1,2,3,8,9)**

**Q345** Thinking back again to the last time you refilled a medication you had been taking and it changed in appearance. Did you contact your physician or prescriber to ask about the new pill's appearance?

- 1 Yes
- 2 No
- 3 Don't recall (VOL)
- 9 Decline to answer (VOL)

**BASE: CONTACTED PHYSICIAN/PRESCRIBER ABOUT NEW PILL'S**

**APPEARANCE (Q345/1)**

**Q350** Did your physician or prescriber relieve your concerns about the new pill's appearance?

- 1 Yes
- 2 No
- 3 Don't recall (VOL)
- 9 Decline to answer (VOL)

**BASE: PILL DIFFERED IN APPEARANCE FROM PRIOR PRESCRIPTION (Q215/1,2,3,8,9)**

**Q355** Thinking back again to the last time you refilled a medication you had been taking and it changed in **appearance**. Did you...?

- 1 Yes
  - 2 No
  - 3 Don't recall (VOL)
  - 9 Decline to answer (VOL)
- 
- 1 Search the Internet to figure out the identity of the new pill
  - 2 Not take the pill home, or tried to return it to the pharmacy after taking it home
  - 3 Have concerns that the new pill would not work as well as the pill you were taking
  - 4 Have concerns that the new pills would cause more side effects than the pill you were taking
  - 5 Use the pill less frequently
  - 6 Stop using the pill
  - 7 Switch back to the prior pill version

**BASE: PILL DIFFERED IN APPEARANCE FROM PRIOR PRESCRIPTION (Q215/1,2,3,8,9)**

**Q363** After taking the pill with the new appearance, did you notice any changes in how you felt?

- 1 Yes
- 2 No
- 8 Not sure (VOL)
- 9 Decline to answer (VOL)

**BASE: NOTICED CHANGES IN HOW FELT/NS/DTA (Q363/1,8,9)**

**Q365** Did you experience any of the following new side effects? (INTERVIEWER: READ LIST)

[MULTIPLE RESPONSE]  
[RANDOMIZE]

- 1 Chest pain
- 2 Nausea
- 3 Headache

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

- 4 Allergic reaction
- 5 Swelling
- 6 Rash
- 7 Abdominal pain
- 8 Blurry or double vision
- 9 Diarrhea
- 10 Dizziness
- 11 Drowsiness
- 12 Runny nose
- 13 Indigestion
- 14 Insomnia
- 15 Shift in mood
- 16 Bleeding
- 17 Drowsiness
- 18 Dry mouth
- 19 Loss of appetite
- 97 None of the above EXCLUSIVE, ANCHOR
- 99 Decline to answer (VOL) EXCLUSIVE, ANCHOR

**BASE: PILL DIFFERED IN APPEARANCE FROM PRIOR PRESCRIPTION (Q215/1,2,3,8,9)**

**Q370** After taking the pill with the new appearance, did you need to...?

- 1 Yes
  - 2 No
  - 8 Not sure (VOL)
  - 9 Decline to answer (VOL)
- 
- 1 Have the dose of your pill adjusted by your doctor
  - 2 Have another new medication for your condition added by your doctor

**SECTION 400: GENERAL QUESTIONS ABOUT BRAND-NAME AND GENERIC DRUGS**

**BASE: ALL QUALIFIED RESPONDENTS**

**Q405** The next questions are general questions about brand-name and generic drugs. Which of the following statements best describes what you think about generic and brand-name drug **effectiveness**? (INTERVIEWER: READ LIST)

- 1 Generic drugs are **definitely** as effective as their brand-name versions
- 2 Generic drugs are **probably** as effective as their brand-name versions
- 3 Generic drugs are **probably not** as effective as their brand-name versions
- 4 Generic drugs are **definitely not** as effective as their brand-name versions
- 8 Not sure or don't know (VOL)
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q410** Which statement best describes what you think about generic and brand-name drug safety? (INTERVIEWER: READ LIST)

- 1 Generic drugs are **definitely** as safe as their brand-name versions
- 2 Generic drugs are **probably** as safe as their brand-name versions
- 3 Generic drugs are **probably not** as safe as their brand-name versions
- 4 Generic drugs are **definitely not** as safe as their brand-name versions
- 8 Not sure or don't know (VOL)
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q415** Which statement best describes what you think about brand-name drug costs? (INTERVIEWER: READ LIST)

- 1 Brand-name drugs are more expensive than they should be
- 2 Brand-name drugs are priced about right
- 3 Brand-name drugs are less expensive than they should be
- 8 Not sure or don't know (VOL)
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q417** Which statement best describes what you think about generic drug costs? (INTERVIEWER: READ LIST)

- 1 Generic drugs are more expensive than they should be
- 2 Generic drugs are priced about right
- 3 Generic drugs are less expensive than they should be
- 8 Not sure or don't know (VOL)
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q420** Which statement best describes what you think about the **active ingredient** in generic and brand-name drugs? (INTERVIEWER: READ LIST)

- 1 Generic drugs are **definitely** made of the same active ingredient and dose strength as their brand-name versions
- 2 Generic drugs are **probably** made of the same active ingredient and dose strength as their brand-name versions
- 3 Generic drugs are **probably not** made of the same active ingredient and dose strength as their brand-name versions
- 4 Generic drugs are **definitely not** made of the same active ingredient and dose strength as their brand-name versions
- 8 Not sure or don't know (VOL)
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q422** Which statement best describes what you think about the **side effects** of generic and brand-name drugs? (INTERVIEWER: READ LIST)

- 1 Generic drugs **definitely** have the same side effects as their brand-name versions
- 2 Generic drugs **probably** have the same side effects as their brand-name versions
- 3 Generic drugs **probably do not** have the same side effects as their brand-name versions
- 4 Generic drugs **definitely do not** have the same side effects as their brand-name versions
- 8 Not sure or don't know (VOL)
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q425** In general, in choosing between taking a generic vs. brand-name drug, would you say you...? (INTERVIEWER: READ LIST)

- 1 Greatly prefer a brand-name drug
- 2 Slightly prefer a brand-name drug
- 3 Slightly prefer a generic drug
- 4 Greatly prefer a generic drug
- 5 Don't prefer one or the other
- 9 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q430** In the last year, how many times have you asked your doctor to prescribe a brand-name drug rather than a generic? (INTERVIEWER: READ LIST)

- 1 4 or more times
- 2 2-3 times
- 3 1 time
- 4 Never
- 8 Don't know or don't recall (VOL)
- 9 Decline to answer (VOL)

**SECTION 500: DEMOGRAPHICS**

**BASE: DOES NOT TAKE GENERIC MEDICATIONS FOR ANY CONDITIONS OF INTEREST (Q135/1-6 AND Q136/2 AND AGE 50+ (Q120/5,6,7))**

**Q500** You mentioned that you do not take a generic drug for [INSERT Q135/1-6 AND Q136/2 RESPONSES WITH COMMAS BETWEEN EACH CONDITION AND "or" BEFORE THE LAST ONE]. However, have you ever been diagnosed with...?

**Q501**

- 1 Yes
- 2 No
- 8 Not sure (VOL)
- 9 Decline to answer (VOL)

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

- 1 Epilepsy or seizure disorder
- 2 Diabetes
- 3 Hypertension
- 4 Hyperlipidemia or high cholesterol
- 5 Depression
- 6 HIV

**BASE: ALL RESPONDENTS, AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q502** [IF QUALIFIED (Q165/1), DISPLAY: Finally, we have a few questions about you.]

What state do you live in?

- |     |                      |     |                |     |                   |
|-----|----------------------|-----|----------------|-----|-------------------|
| 101 | Alabama              | 119 | Louisiana      | 137 | Oklahoma          |
| 102 | Alaska               | 120 | Maine          | 138 | Oregon            |
| 103 | Arizona              | 121 | Maryland       | 139 | Pennsylvania      |
| 104 | Arkansas             | 122 | Massachusetts  | 140 | Rhode Island      |
| 105 | California           | 123 | Michigan       | 141 | South Carolina    |
| 106 | Colorado             | 124 | Minnesota      | 142 | South Dakota      |
| 107 | Connecticut          | 125 | Mississippi    | 143 | Tennessee         |
| 108 | Delaware             | 126 | Missouri       | 144 | Texas             |
| 109 | District of Columbia | 127 | Montana        | 145 | Utah              |
| 110 | Florida              | 128 | Nebraska       | 146 | Vermont           |
| 111 | Georgia              | 129 | Nevada         | 147 | Virginia          |
| 112 | Hawaii               | 130 | New Hampshire  | 148 | Washington        |
| 113 | Idaho                | 131 | New Jersey     | 149 | West Virginia     |
| 114 | Illinois             | 132 | New Mexico     | 150 | Wisconsin         |
| 115 | Indiana              | 133 | New York       | 151 | Wyoming           |
| 116 | Iowa                 | 134 | North Carolina | 999 | Decline to answer |
| 117 | Kansas               | 135 | North Dakota   |     |                   |
| 118 | Kentucky             | 136 | Ohio           |     |                   |

**BASE: ALL RESPONDENTS, AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q505** Please tell me the 5-digit zip code for the primary location in which you live.

[RANGE: 00000-99999]

□□□□□

(INTERVIEWER: CONFIRM BEFORE MOVING TO NEXT SCREEN)

**BASE: ALL RESPONDENTS, AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q506** HIDDEN COMPUTE FOR CENSUS REGIONS

[**Northeast:** Q502/107,120,122,130,140,146,131,133,139, GET CODE 1.

**South:** Q502/108,109,111,121,149,101,110,118,125,134,141,143,147,104,119,137,144, GET CODE 2.

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

**Midwest:** Q502/114,115,123,136,150,116,117,124,126,128,135,142, GET CODE 3.

**West:** Q502/103,106,113,127,129,132,145,151,102,105,112,138,148, GET CODE 4.]

- 1 Northeast
- 2 South
- 3 Midwest
- 4 West
- 9 Decline to answer

**BASE: ALL RESPONDENTS, AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q507** HIDDEN COMPUTE FOR HARRIS REGIONS

- 1 East 1
- 2 East 2
- 3 Midwest 1
- 4 Midwest 2
- 5 South 1
- 6 South 2
- 7 West 1
- 8 West 2
- 9 Decline to answer

**BASE: ALL QUALIFIED RESPONDENTS**

**Q508** Including yourself, how many people age 18 or older live in your household?

(INTERVIEWER: ENTER 98 FOR NOT SURE AND 99 FOR DECLINE TO ANSWER)

[RANGE: 1-50, 98, 99]

[NON-MANDATORY]

□□

**BASE: ALL RESPONDENTS, AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q474** Are you of Spanish or Hispanic origin, such as Latin American, Mexican, Puerto Rican, or Cuban?

- 1 Yes, of Hispanic origin
- 2 No, not of Hispanic origin
- 4 Decline to answer

**BASE: ALL RESPONDENTS, AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q480** Do you consider yourself...? (INTERVIEWER: READ LIST)

- 1 White/Caucasian
- 2 Black/African-American

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

- 3 Asian or Pacific Islander
- 4 Native American/American Indian/Alaskan native
- 5 Mixed racial background
- 6 Some other race
- 94 Decline to Answer (VOL)

**BASE: ETHNICITY IS TO BE ASKED AND HAVE ETHNIC CODES, AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q485** [HIDDEN COMPUTE QUESTION]

[IF ANSWERED HISPANIC (Q474/1) ANSWER TO Q485 IS CODE 7, OTHERWISE Q485=Q480.]

- 1 White/Caucasian
- 2 Black/African-American
- 3 Asian or Pacific Islander
- 4 Native American/American Indian/Alaskan native
- 5 Mixed racial background
- 6 Some other race
- 7 Hispanic/Latino
- 94 Decline to Answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q515** What is your occupation? (INTERVIEWER: IF RESPONDENT IS RETIRED, ASK WHAT WAS HIS OR HER OCCUPATION.)

[TEXT BOX]

**BASE: ALL RESPONDENTS, AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q520** What is the highest level of schooling you have completed? (INTERVIEWER: READ LIST UNTIL RESPONSE IS GIVEN)

- 1 Less than high school
- 2 High School/GED
- 3 Some college or 2 year college degree (Associates)
- 4 4 year college degree
- 5 Master's degree
- 6 Advanced health-related degree (for example, MD, DDS, health-related PhD)
- 7 Advanced non-health-related degree (for example, JD, non-health-related PhD)
- 8 Not sure (VOL)
- 9 Decline to answer (VOL)

**BASE: ALL RESPONDENTS, AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q462** Which of the following income categories best describes your total 2015 household income before taxes? (INTERVIEWER: READ LIST UNTIL RESPONSE IS GIVEN)

- 1 Less than \$15,000
- 2 \$15,000 to less than \$35,000
- 3 \$35,000 to less than \$50,000
- 4 \$50,000 to less than \$75,000
- 5 \$75,000 to less than \$100,000
- 6 \$100,000 or more
- 98 Not sure (VOL)
- 99 Decline to answer (VOL)

**BASE: ALL RESPONDENTS, AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q530** Are you taking this survey on a...? (INTERVIEWER: READ LIST)

- 1 Landline
- 2 Cell phone
- 8 Not sure (VOL)
- 9 Decline to answer (VOL)

**BASE: ALL RESPONDENTS, AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q360** At any time during the last two years, have you lived somewhere without a landline phone? By this I mean, did you live anywhere in which there was no phone that you would plug into a wall socket in order to make and receive calls?

- 1 Yes, lived somewhere without a landline phone
- 2 No, have not lived somewhere without a landline phone
- 8 Not sure (VOL)
- 9 Decline to answer (VOL)

**BASE: ALL RESPONDENTS, AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**PHONLNS** In the home in which you currently live, how many separate telephone lines (not cell phones) with different telephone numbers do you have that can receive phone calls? Do not count those that are only used for faxes or modems. (INTERVIEWER: READ LIST)

- 1 None
- 2 One
- 3 Two
- 4 Three or more
- 8 Not sure (VOL)
- 9 Decline to answer (VOL)

**BASE: TAKING SURVEY ON LANDLINE (Q530/1), AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q1502** Do you **personally** have a working cell phone?

- 1 Yes
- 2 No
- 98 Don't know or Not sure (VOL)
- 99 Decline to answer (VOL)

**BASE: TAKING SURVEY ON LANDLINE (Q530/1), AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q1503** Does anyone **else** in your household have a working cell phone?

- 1 Yes
- 2 No
- 98 Not sure (VOL)
- 99 Decline to answer (VOL)

**BASE: TAKING SURVEY ON CELL PHONE (Q530/2), AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q1504** Is there at least one telephone inside your home that is currently working and is not a cell phone?

- 1 Yes
- 2 No
- 98 Not sure (VOL)
- 99 Decline to answer (VOL)

**BASE: ALL RESPONDENTS AGE 50+ (Q120/5,6,7) AND DIAGNOSED WITH CONDITION OF INTEREST (Q500/1-6 AND Q501/1)**

**Q1506** Of all the telephone calls that you/your household receives, are...? (INTERVIEWER: READ LIST)

- 1 All or almost all calls received on cell phones
- 2 Some received on cell phones and some on regular home phones
- 3 Very few or none received on cell phones
- 98 Don't know or Not sure (VOL)
- 99 Decline to answer (VOL)

**BASE: ALL QUALIFIED RESPONDENTS**

**Q540** We are nearly finished, please let me know if you have any additional comments about your views about or experiences with changes in pill appearance.

[PN: DO NOT LIMIT NUMBER OF CHARACTERS]  
[TEXT BOX]

**BASE: ALL QUALIFIED RESPONDENTS AND PRETEST (Q100/1)**

**Q600** Thank you for your participation. Before we finish, the researchers at \_\_\_\_\_ are interested in your feedback to help them improve the survey questions. You can help by answering several more short questions.

(IF NEEDED: There are 9 questions to answer.)

Were the questions easy to understand? (INTERVIEWER: PROBE IF NECESSARY)

[TEXT BOX]

**BASE: PRETEST (Q100/1)**

**Q605** Were any questions confusing? If, so which ones? (INTERVIEWER: PROBE IF NECESSARY)

[TEXT BOX]

**BASE: PRETEST (Q100/1)**

**Q610** Did any of the individual questions seem too long? (INTERVIEWER: PROBE IF NECESSARY)

[TEXT BOX]

**BASE: PRETEST (Q100/1)**

**Q615** Were the response options easy to understand? (INTERVIEWER: PROBE IF NECESSARY)

[TEXT BOX]

**BASE: PRETEST (Q100/1)**

**Q620** Were the response options appropriate for the question being asked? (INTERVIEWER: PROBE IF NECESSARY)

[TEXT BOX]

**BASE: PRETEST (Q100/1)**

**Q625** Were there any concepts you didn't understand? (INTERVIEWER: PROBE IF NECESSARY)

[TEXT BOX]

**BASE: PRETEST (Q100/1)**

**Q630** Did the questions seem to "flow" from one to the next? (INTERVIEWER: PROBE IF NECESSARY)

[TEXT BOX]

**BASE: PRETEST (Q100/1)**

Q635 How did you find the length of the survey? (INTERVIEWER: PROBE IF NECESSARY)

[TEXT BOX]

**BASE: PRETEST (Q100/1)**

Q640 Any other comments about the survey itself? (INTERVIEWER: PROBE IF NECESSARY)

[TEXT BOX]

**eAppendix B. Patient Responses to the Survey Questionnaire**

Questions	Responses (N=1,000)	
	n	%
Thinking about the last year, which of the following best describes how pill appearance relates to your medication use for [insert respondent reported medication]. Do you rely on pill appearance to make sure you take the correct medication?		
Always rely on	334	34
Usually rely on	195	20
Rarely rely on	177	18
Never rely on	277	28
In the last year, have you received a prescription refill in which the pills differed in appearance from the previous prescription or refill you received?		
Yes	514	53
In the last year, how often did you receive a prescription refill in which the pills differed in appearance from the previous prescription or refill you received?		
4 or more times	49	10
2-3 times	220	43
1 time	227	45
Never	12	2
Do you associate the appearance of your pills with the drug company making them (for example: ‘because this pill is green, I know it is from Merck’)?		
Yes	92	9
Imagine you were ready for a normal refill of a prescription drug you had been on for a long time. How much would you prefer for the pills in the refill to have the same...?		
Color		
Definitely would prefer	407	41
Probably would prefer	227	23
Have no preference	328	33
Probably would not prefer	13	1
Definitely would not prefer	21	2
Not Sure	4	0.4
Shape		
Definitely would prefer	399	40
Probably would prefer	228	23
Have no preference	333	33
Probably would not prefer	15	2

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

	Definitely would not prefer	22	2
	Not Sure	3	0.3
Size	Definitely would prefer	427	43
	Probably would prefer	251	25
	Have no preference	287	29
	Probably would not prefer	14	1
	Definitely would not prefer	17	2
	Not Sure	3	0.3
Markings	Definitely would prefer	371	37
	Probably would prefer	175	18
	Have no preference	400	40
	Probably would not prefer	15	2
	Definitely would not prefer	24	2
	Not Sure	13	1
In the past year, when one of your pills changed in appearance from one refill to another, did you think that change meant that a different manufacturer was making the pill?			
	Yes	330	72
In the future, if your pill appearance changes from one refill to another, which of the following best describes what you'd think? Would you...?			
	Definitely like to be notified	656	66
	Probably like to be notified	156	16
	Probably not like to be notified	21	2
	Definitely not like to be notified	8	0.8
	No preference	157	16
If your pharmacy notified you about the pill appearance change, how would you prefer to be notified?			
	Verbally, in person or on the phone	439	45
	Using a sticker on the prescription bottle	345	36
	No preference	184	19
Do you think that if your generic pill changed in its appearance during a routine refill that the new pill would be less effective?			
	Yes	107	11
Do you think that if your generic pill changed in its appearance during a routine refill that the new pill would be less safe?			
	Yes	94	10

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

Assume that generic pill A costs you \$5 per month. It would cost the manufacturers an extra \$1 per month to ensure that the appearance of generic pill A remains constant every time you refill it. Would you pay \$6 per month for generic pill A to ensure that your pill has the same size, shape, and color at each refill? Yes	368	38
Assume that generic pill B costs you \$10 per month. It would cost the manufacturers an extra \$5 per month to ensure that the appearance of generic pill B remains constant every time you refill it. Would you pay \$15 per month for generic pill B to ensure that your pill has the same size, shape, and color at each refill? Yes	93	10
Assume that generic pill C costs you \$15 per month. It would cost the manufacturers an extra \$10 per month to ensure that the appearance of generic pill C remains constant every time you refill it. Would you pay \$25 per month for generic pill C to ensure that your pill has the same size, shape, and color at each refill? Yes	43	4
As best you recall, did your pill change in...? Color Shape Size Any Markings	310 212 192 91	68 46 42 20
When your pill changed in appearance, as best you recall, did your pharmacist...? Talk to you about the change, in person or on the phone Put a sticker on the pill bottle to let you know about the change	176 201	36 45
When your pill changed in appearance, as best you recall, did you...? Think the pill you got was the same as before, even though it looked different Think you got the wrong pill Ask your pharmacist about the new pill's appearance	350 143 175	72 29 35
Did your pharmacist relieve your concerns about the new pill's appearance? Yes	167	97

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

Thinking back again to the last time you refilled a medication you had been taking and it changed in appearance. Did you contact your physician or prescriber to ask about the new pill's appearance?		
Yes	44	9
Did your physician or prescriber relieve your concerns about the new pill's appearance?		
Yes	37	84
Thinking back again to the last time you refilled a medication you had been taking and it changed in appearance. Did you...?		
Search the internet to figure out the identity of the new pill	52	10
Not take the pill home, or tried to return it to the pharmacy after taking it home	19	4
Have concerns that the new pill would not work as well as the pill you were taking	82	17
Have concerns that the new pills would cause more side effects than the pill you were taking	48	10
Use the pill less frequently	42	8
Stop using the pill	19	4
Switch back to the prior pill version	61	12
After taking the pill with the new appearance, did you notice any changes in how you felt?		
Yes	28	6
Did you experience any of the following new side effects?		
Chest Pain	3	0.3
Nausea	6	0.6
Headache	3	0.3
Allergic Reaction	6	0.6
Swelling	4	0.4
Rash	2	0.2
Abdominal Pain	3	0.3
Blurry or Double Vision	7	0.7
Diarrhea	4	0.4
Dizziness	5	0.5
Drowsiness	10	1
Runny Nose	4	0.4
Indigestion	5	0.5
Insomnia	8	0.8
Shift in mood	12	1.2
Bleeding	2	0.2

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

Dry mouth	11	1.1
Loss of appetite	4	0.4
None of the above	9	0.9
After taking the pill with the new appearance, did you need to...?		
Have the dose of your pill adjusted by your doctor	32	6
Have another new medication for your condition added by your doctor	15	3
Which of the following statements best describes what you think about generic and brand-name drug effectiveness?		
Generic drugs are definitely as effective as their brand-name versions	426	44
Generic drugs are probably as effective as their brand-name versions	442	46
Generic drugs are probably not as effective as their brand-name versions	82	8
Generic drugs are definitely not as effective as their brand-name versions	21	2
Which statement best describes what you think about generic and brand-name drug safety?		
Generic drugs are definitely as safe as their brand-name versions	424	44
Generic drugs are probably as safe as their brand-name versions	504	52
Generic drugs are probably not as safe as their brand-name versions	36	4
Generic drugs are definitely not as safe as their brand-name versions	10	1
Which statement best describes what you think about brand-name drug costs?		
Brand-name drugs are more expensive than they should be	873	90
Brand-name drugs are priced about right	88	9
Brand-name drugs are less expensive than they should be	9	0.9
Which statement best describes what you think about generic drug costs?		
Generic drugs are more expensive than they should be	230	24
Generic drugs are priced about right	662	69
Generic drugs are less expensive than they should be	71	7
Which statement best describes what you think about the active ingredient in generic and brand-name drugs?		
Definitely made of same active ingredient and dose strength	327	35
Probably made of same active ingredient and dose strength	518	55
Probably not made of same active ingredient and dose strength	74	8

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

Definitely not made of same active ingredient and dose strength	23	2
Which statement best describes what you think about the side effects of generic and brand-name drugs?		
Definitely have the same same side effects	326	35
Probably have the same same side effects	532	56
Probably do not have the same same side effects	65	7
Definitely do not have the same same side effects	20	2
In general, in choosing between taking a generic vs. brand-name drug, would you say you...?		
Greatly prefer brand-name drug	137	14
Slightly prefer brand-name drug	150	15
Slightly prefer generic drug	118	12
Greatly prefer generic drug	281	28
Dont prefer one or other	308	31
In the last year, how many times have you asked your doctor to prescribe a brand-name drug rather than a generic?		
4 or more times	50	5
2-3 times	55	6
1 time	81	8
Never	801	81
Have you ever been diagnosed with...?		
Epilepsy or seizure disorder	13	1
Diabetes	46	6
Hypertension	71	18
Hyperlipidemia or high cholesterol	96	22
Depression	69	9
HIV	1	0.1

**eAppendix C. Pharmacist Survey Instrument**

\_\_\_\_\_ : \_\_\_\_\_

**Thank you for agreeing to take this survey.** Once again, the goal is to learn about your perspective as a pharmacist about the **appearance** of the prescription pills that you dispense. These changes can include **pill color, shape, size,** and any **markings** (such as text, lines, grooves, or designs) **printed on the pill.** **Please enjoy the \$5 we included in your survey packet** as a token of our gratitude for completing this survey.

Please keep in mind:

- This survey requires no outside materials, and your responses will not be linked to your personal information.
- We plan to widely disseminate the results of this survey in peer-reviewed journals. The survey is designed to take no more than 20 minutes to complete.
- The Institutional Review Board at \_\_\_\_\_ has approved this protocol. Your participation is voluntary.

**We appreciate your contribution to this important topic.**

\*\*\*\*\*

*Instructions for completing the survey:*

- As you read through the survey, please answer each question based on the information provided. If you do not know or do not have an answer to a question, do not guess; just select “don't know” (if available) or move onto the next question.
- Using a blue or black pen, place an “X” in the box next to the appropriate response as shown: .
- If asked to provide a written response to a question, please PRINT legibly in the space provided.
- **Note:** When we say the word “pill” in this survey, we mean drugs in the form of capsules or tablets.
- **As a reminder, you can also take the survey online if you prefer. The link to the online version is noted in the cover letter enclosed in the survey packet.**

\*\*\*\*\*

**In this first set of questions, we are interested in your views on generic pills in general. This information will be used to help understand your views on the appearance of generic pills.**

**Do you think generic pills are...?**

- <sub>1</sub> **Definitely** as **effective** as their brand-name versions
- <sub>2</sub> **Probably** as **effective** as their brand-name versions
- <sub>3</sub> **Probably not** as **effective** as their brand-name versions
- <sub>4</sub> **Definitely not** as **effective** as their brand-name versions
- <sub>8</sub> Don't know/Not sure

**Do you think generic pills are...?**

- <sub>1</sub> **Definitely** as **safe** as their brand-name versions
- <sub>2</sub> **Probably** as **safe** as their brand-name versions
- <sub>3</sub> **Probably not** as **safe** as their brand-name versions
- <sub>4</sub> **Definitely not** as **safe** as their brand-name versions
- <sub>8</sub> Don't know/Not sure

**Do you think generic pills...?**

- <sub>1</sub> **Definitely** have the same **side effects** as their brand-name versions
- <sub>2</sub> **Probably** have the same **side effects** as their brand-name versions
- <sub>3</sub> **Probably do not** have the same **side effects** as their brand-name versions
- <sub>4</sub> **Definitely do not** have the same **side effects** as their brand-name versions
- <sub>8</sub> Don't know/Not sure

**Do you think generic pills are...?**

- <sub>1</sub> **Definitely** made of the same **active ingredient and dose strength** as their brand-name versions
- <sub>2</sub> **Probably** made of the same **active ingredient and dose strength** as their brand-name versions
- <sub>3</sub> **Probably not** made of the same **active ingredient and dose strength** as their brand-name versions
- <sub>4</sub> **Definitely not** made of the same **active ingredient and dose strength** as their brand name versions
- <sub>8</sub> Don't know/Not sure

**When you receive a prescription for a brand-name pill, and the prescription permits substitution, and the patient does not request brand-only, about how often do you fill the prescription with a generic pill?**

- <sub>1</sub> Almost always (greater than 90% of the time)
- <sub>2</sub> Commonly (51-90% of the time)
- <sub>3</sub> Occasionally (10-50% of the time)
- <sub>4</sub> Rarely (less than 10% of the time)
- <sub>5</sub> Never

**Among all the generic pills you carry, approximately how many times in an average month do you notice that your pharmacy has changed the manufacturer to one that has a different appearance?**

- <sub>1</sub> 0-1
- <sub>2</sub> 2-5

- <sub>3</sub> 6-15
- <sub>5</sub> More than 15

**How often are you personally alerted when your pharmacy, distributor, or wholesaler changes suppliers for the generic pills it carries to one that has a different appearance?**

- <sub>1</sub> Almost always
- <sub>2</sub> Commonly
- <sub>3</sub> Occasionally
- <sub>4</sub> Rarely
- <sub>5</sub> Never

**The next series of questions is about pill appearance. Pill appearance includes the pill's color, shape, size, as well as the pill's markings (such as text, lines, grooves, or designs).**

**Which of the following best describes your preference as to the appearance of the generic pills you dispense?**

- <sub>1</sub> I **much prefer** my pharmacy to dispense generics with the **same appearance** as the brand-name
- <sub>2</sub> I **somewhat prefer** my pharmacy to dispense generics with the **same appearance** as the brand-name
- <sub>3</sub> I have **no preference** as to whether my pharmacy dispenses generics with the **same appearance** as the brand-name
- <sub>4</sub> I **somewhat prefer** my pharmacy **not** dispense generics with the **same appearance** as the brand-name
- <sub>5</sub> I **much prefer** my pharmacy **not** dispense generics with the **same appearance** as the brand-name
- <sub>8</sub> Don't know/Not sure

**How likely is it that differences in appearance among different manufacturers' versions of the same pill (generic/generic or brand/generic) will cause a pharmacist to make a dispensing error?**

- <sub>1</sub> Very likely
- <sub>2</sub> Somewhat likely
- <sub>3</sub> Not very likely

**How likely is it that similarities in appearance among different manufacturers' versions of the same pill (generic/generic or brand/generic) will cause a pharmacist to make a dispensing error?**

- <sub>1</sub> Very likely
- <sub>2</sub> Somewhat likely
- <sub>3</sub> Not very likely

**How commonly do the following changes in pill appearance lead patients to express concern to you about increased side effects or reduced effectiveness?**

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

	Almost always	Commonly	Occasionally	Rarely	Never
a. Color	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
b. Shape	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
c. Size	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
d. Markings (text, lines, grooves, or designs)	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>

**Considering instances when you refill a prescription with a pill that differs in appearance from the prior prescription without having changed the drug or dose, please indicate how often you do each of the following.**

	Almost always	Commonly	Occasionally	Rarely	Never
a. Notify the patient verbally, in person or on the phone	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
b. Notify the patient using a sticker on a prescription bottle	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
c. Log an incident report with the pharmacy when a patient complains about a change in pill appearance	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
d. Leave a special note in the patient's pharmacy record indicating that the change occurred	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>

**Please indicate how often the following occur when a patient is dispensed a medication**

**that differs in appearance from the prior prescription without having changed the drug or dose.**

	<b>Almost always</b>	<b>Commonly</b>	<b>Occasionally</b>	<b>Rarely</b>	<b>Never</b>
a. Changes in pill appearance lead patients to report side effects to me	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
b. Changes in pill appearance lead patients to report to me that their pill doesn't work	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
c. Patients tell me that their pills should maintain consistency in appearance	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
d. Changes in pill appearance lead to gaps in medication adherence for patients I service	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
e. Changes in pill appearance lead patients to discontinue their medications entirely	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
f. Changes in pill appearance lead patients to refuse to take home the medication (or try to return it to the pharmacy after taking it home)	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>
g. Changes in pill appearance lead patients to express to me that they received the wrong medication	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	<input type="checkbox"/> <sub>5</sub>

h. Changes in pill appearance lead patients to express confusion about the new medication's appearance

<sub>1</sub>                      <sub>2</sub>                      <sub>3</sub>                      <sub>4</sub>                      <sub>5</sub>

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**Please enter the 5-digit U.S. zip code for the primary location in which you practice.**  
*If you are practice in more than 1 zip code, enter the zip code where you spend the most time.*

**Are you...?**

- <sub>1</sub> Male  
<sub>2</sub> Female

**Please indicate your race/ethnicity.** *Please select all that apply.*

- <sub>1</sub> White  
<sub>2</sub> Black/African American  
<sub>3</sub> Asian or Other Pacific Islander  
<sub>4</sub> American Indian or Alaskan Native  
<sub>5</sub> Latino  
<sub>6</sub> Other (specify) \_\_\_\_\_

**Please describe the pharmacy in which you are practicing.** *If you practice in more than one pharmacy, please answer for the one in which you spend the most time.*

- <sub>1</sub> Independent (4 or fewer stores)  
<sub>2</sub> Regional chain (approximately between 4 and 250 stores)  
<sub>3</sub> National chain  
<sub>4</sub> Franchise  
<sub>6</sub> Other (specify) \_\_\_\_\_

*please answer for the one in which you spend the most time.*

- <sub>1</sub> Stand-alone  
<sub>2</sub> Supermarket-based  
<sub>3</sub> Pharmacy chain  
<sub>4</sub> Large store-based

**Which of the following best describes your title?**

- <sub>1</sub> Chief pharmacist  
<sub>2</sub> Owner/Chief pharmacist  
<sub>3</sub> Owner/Pharmacist  
<sub>4</sub> Staff pharmacist  
<sub>6</sub> Other (specify) \_\_\_\_\_

**How many years have you been in practice?** *If less than a year, please enter "0."*

years

**About how many prescriptions are filled per day in the pharmacy in which you work?**  
*If you work in more than one pharmacy, please answer for the one in which you spend the most time.*

- <sub>1</sub> Fewer than 100
- <sub>2</sub> 100-200
- <sub>3</sub> 201-300
- <sub>4</sub> 300 or more

**From what source(s) do you learn about a drug's safety and effectiveness?** *Please select all that apply.*

- <sub>1</sub> Continuing education requirements
- <sub>2</sub> Visit from a pharmaceutical representative
- <sub>3</sub> Literature from a payor formulary committee
- <sub>4</sub> Pharmacy or professional journals
- <sub>5</sub> Package inserts
- <sub>6</sub> Text or reference books
- <sub>7</sub> Physicians
- <sub>8</sub> Pharmacist colleagues
- <sub>9</sub> Patients
- <sub>96</sub> Other (specify) \_\_\_\_\_

**Please provide any additional comments about your views about or experiences with changes in pill appearance for regular or NTI pills.**

***THANK YOU FOR TAKING THE TIME TO COMPLETE THIS SURVEY. PLEASE RETURN IT IN THE ENCLOSED ENVELOPE***

***OR MAIL IT TO THE ADDRESS NOTED ON THE BOOKLET COVER.***

**eAppendix D. Pharmacist Responses to the Survey Questionnaire**

Questions	Responses (N=710)	
	n	%
Do you think generic pills are EFFECTIVE as ...?		
Definitely	406	58
Probably	275	39
Probably not	10	1
Definitely not	4	0.6
Don't know/Not sure	4	0.6
Do you think generic pills are SAFE as ...?		
Definitely	480	69
Probably	203	29
Probably not	10	1
Definitely not	1	0.1
Don't know/Not sure	3	0.4
Do you think generic pills have same side effects?		
Definitely	376	54
Probably	303	44
Probably not	13	2
Definitely not	2	0.3
Don't know/Not sure	3	0.4
Do you think generic pills have same ingredient?		
Definitely	537	77
Probably	148	21
Probably not	8	1
Definitely not	1	0.1
Don't know/Not sure	3	0.4
How often do you fill the prescription with a generic pill?		
Almost always	675	97
Commonly	17	2
Occasionally	1	0.1
Rarely	2	0.3
Never	2	0.3
How many times in an average month do you notice that your pharmacy has changed the manufacturer to one that has a different appearance?		
0-1	105	15
2-5	267	38
6-15	172	25
More than 15	152	22
How often are you personally alerted when pills it carries changes to one that has a different appearance?		

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

	Almost always	123	18
	Commonly	99	14
	Occasionally	88	13
	Rarely	197	28
	Never	192	28
Which of the following best describes your preference as to the appearance of the generic pills you dispense?			
	Much prefer generics to have the same appearance as brand	129	19
	Somewhat prefer generics to have the same appearance as brand	108	16
	No preference for generics to have the same appearance as brand	369	54
	Somewhat prefer generics to not have the same appearance as brand	34	5
	Much prefer generics to not have the same appearance as brand	45	7
How likely is it that differences in appearance will cause a pharmacist to make a dispensing error?			
	Very likely	45	7
	Somewhat likely	249	36
	Not very likely	404	58
How likely is it that similarities in appearance will cause a pharmacist to make a dispensing error?			
	Very likely	95	14
	Somewhat likely	267	38
	Not very likely	336	48
How commonly do the following changes in pill appearance lead patients to express concern to you about increased side effects or reduced effectiveness?			
Color	Almost always	138	20
	Commonly	169	24
	Occasionally	212	30
	Rarely	136	20
	Never	42	6
Shape	Almost always	96	14
	Commonly	162	23
	Occasionally	207	30
	Rarely	176	25
	Never	55	8
Size	Almost always	80	12
	Commonly	148	21

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

Markings	Occasionally	244	35
	Rarely	173	25
	Never	53	8
	Almost always	24	4
	Commonly	55	8
	Occasionally	182	26
	Rarely	327	47
	Never	106	15
Considering instances when you refill a prescription with a pill that differs in appearance from the prior prescription without having changed the drug or dose, please indicate how often you do each of the following.			
Notify the patient verbally, in person or on the phone			
	Almost always	321	47
	Commonly	207	30
	Occasionally	86	13
	Rarely	54	8
	Never	23	3
Notify the patient using a sticker on a prescription bottle			
	Almost always	507	73
	Commonly	106	15
	Occasionally	26	4
	Rarely	20	3
	Never	35	5
Log an incident report with the pharmacy when a patient complains about a change in pill appearance			
	Almost always	14	2
	Commonly	26	4
	Occasionally	60	9
	Rarely	213	31
	Never	375	55
Leave a special note in the patient pharmacy record indicating that the change occurred			
	Almost always	86	13
	Commonly	86	13
	Occasionally	98	14
	Rarely	183	27
	Never	238	34

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

Please indicate how often the following occur when a patient is dispensed a medication that differs in appearance from the prior prescription without having changed the drug or dose.		
Changes in pill appearance lead patients to report side effects to me		
Almost always	7	1
Commonly	32	5
Occasionally	235	34
Rarely	349	50
Never	72	10
Changes in pill appearance lead patients to report to me that their pill doesn't work		
Almost always	10	1
Commonly	58	8
Occasionally	307	44
Rarely	277	40
Never	43	6
Patients tell me that their pills should maintain consistency in appearance		
Almost always	42	6
Commonly	152	22
Occasionally	225	33
Rarely	177	26
Never	97	14
Changes in pill appearance lead to gaps in medication adherence for patients I service		
Almost always	3	0.4
Commonly	32	5
Occasionally	144	21
Rarely	348	50
Never	165	24
Changes in pill appearance lead patients to discontinue their medications entirely		
Almost always	2	0.3
Commonly	10	2
Occasionally	58	8
Rarely	357	52
Never	265	38
Changes in pill appearance lead patients to refuse to take home the medication		
Almost always	3	0.4
Commonly	34	5
Occasionally	159	23

RUNNING HEADER: Pill Appearance Changes and Patient Adherence

	Rarely	346	50
	Never	154	22
Changes in pill appearance lead patients to express to me that they received the wrong medication			
	Almost always	30	4
	Commonly	170	25
	Occasionally	347	50
	Rarely	136	20
	Never	11	2
Changes in pill appearance lead patients to express confusion about the new medication's appearance			
	Almost always	28	4
	Commonly	184	27
	Occasionally	352	51
	Rarely	116	17
	Never	15	2