Published in final edited form as:

J Health Commun. 2017 February ; 22(2): 171–181. doi:10.1080/10810730.2016.1258745.

Placement and Format of Risk Information on Direct-to-Consumer Prescription Drug Websites

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Abstract

We investigated whether the location and format of risk information on branded prescription drug websites influences consumers' knowledge and perceptions of the drug's risks. Participants (Internet panelists with high cholesterol [$n = 2,609$] or seasonal allergies [$n = 2,637$]) were randomly assigned to view a website promoting a fictitious prescription drug for their condition. The website presented risk information at the bottom of the homepage, at the bottom of the homepage with a signal above indicating that the risk information was located below, or on a linked secondary page. We also varied the format of risk information (paragraph, checklist, bulleted list, highlighted box). Participants then answered questions on risk recall and perceptions. Participants recalled fewer drug risks when the risks were placed on a secondary page. The signal had little effect and risk information format did not affect outcomes. The location of risk information on prescription drug websites can affect consumer knowledge of drug risks; however, signals and special formatting may not be necessary for websites to adequately inform consumers about drug risks. We recommend that prescription drug websites maintain risk information on their homepages to achieve "fair balance" as required by the U.S. Food and Drug Administration.

Keywords

prescription drug; advertising; Internet; DTCA; risk communication

Prescription drugs are increasingly promoted to consumers on the Internet (Mackey, Cuomo, Liang, 2015; Sullivan, Aikin, Chung-Davies, & Wade, 2016), including branded prescription drug websites (Liang & Mackey, 2011). Consumers use these websites to learn about prescription drugs, and these sites can prompt them to discuss specific drugs with their healthcare providers (Choi & Lee, 2007). Although the interactive nature of the Internet allows for features not possible with traditional media (i.e., print, radio, and television), such as scrolling information, pop-up windows, and linking to more information, FDA regulations still require that prescription drug promotion includes a "fair balance" of information about the benefits and risks of advertised products, both in terms of content and presentation (Prescription Drug Advertisements, 2012). Such balance of risk and benefit information is a

cornerstone of informed decision making, helping individuals to understand both the potential benefits and potential harms of treatment options before selecting them (Rimer, Briss, Zeller, Chan & Woolf, 2004; Sheridan, Harris & Woolf, 2004). Currently, there are a number of questions surrounding how best to achieve “fair balance” in online direct-to-consumer (DTC) promotion (U.S. Food and Drug Administration, 2014; Hoy & Park, 2014; Mintzes, 2016; Southwell & Rupert, 2016).

A few content analyses have examined how DTC websites communicate benefit and risk information. These analyses demonstrate that, although most websites include information on side effects and contraindications (Macias & Lewis, 2006), risk information is often presented less prominently and in fewer locations on the website than drug benefit information (Hicks, Wogalter, & Vigilante, 2005; Huh & Cude, 2004; Sheehan, 2007). Content analyses also suggest that risk information on DTC prescription drug websites is often incomplete (Davis, Cross, & Crowley, 2007) and written at very high literacy levels (Naik, 2007). Although such content analyses provide insight into current industry practices, they cannot examine how the current presentation of risk information affects consumer understanding and perceptions or how current practices might be improved.

Unfortunately, very few experimental studies—which can examine how the presentation of risk information affects consumer knowledge and perceptions—have been conducted in this area. One such study examined how individuals interact with prescription drug websites (Vigilante & Wogalter, 2005), and it found that the placement of risk and benefit information on a website is an important factor in whether it achieves “fair balance.” Specifically, individuals’ ability to find and accurately recall risk information was enhanced when risk and benefit information were presented separately and when risk information was presented on a higher-order page (i.e., on the homepage or on a second-level page clearly linked from the homepage). This is consistent with previous research into online reading and navigation, which has found that individuals primarily scan webpages (U.S. Department of Health and Human Services & U.S. General Services Administration, 2006), are more likely to read short sections of standalone text (Summers & Summers, 2004; 2005), read only about 20% of webpage content (Weinreich, Obendorf, Herder, & Mayer, 2008), and are unlikely to scroll down to read information lower on the page (Nielson, 2010; Summers & Summers, 2004; Zacadoolas, Blanco, Boyer, & Pleasant, 2002).

Given that risk information on prescription drug websites often appears “below the fold,” requiring users to scroll down to see it, there are concerns that consumers may overlook this information (Google, 2014; Summers & Summers, 2004). Previous research has shown that signals, or callouts, can direct readers’ attention to pertinent information in print materials and increase individuals’ ability to remember it (Lorch & Lorch, 1995; 1996; Lorch, Lorch, & Inman, 1993; Spyridakis, 1989). Thus, a signal indicating that risk information can be found lower on the homepage may prompt consumers to scroll down and see risk information that they otherwise might miss.

Likewise, previous research has shown that presenting information in certain formats may improve attention and comprehension. Studies have demonstrated that presenting information in a list format improves recall and comprehension compared to a paragraph

format (Morrow, Leirer, Andrassy, Hier, & Menard, 1998; Raynor & Dickinson, 2009). Further, studies have shown that highlighted text is difficult to ignore, even when readers are told that it is irrelevant (Chi, Gumbrecht, & Hong, 2007; Silvers & Kreiner, 1997). Previous research and best practices also recommend using bullets or lists because they are easier to read and understand, regardless of a reader's literacy level (Redish, Felker, & Rose, 1981; The Plain Language Action and Information Network, 2011; U.S. Department of Health and Human Services & U.S. General Services Administration, 2006). Past research has also shown that format can affect the processing of information. Russo (1977) examined a change in the format of unit pricing information in a market scenario. Despite the same amount of information, the format influenced consumer's ability to use it. Other research (Bettman & Kakkar, 1977) has also found that people tend not to transform the information they are provided, suggesting that format changes can cause large differences in processing. More recent research in prescription drug labeling showed that large format changes can affect recall of information but that minor format differences do not (Boudewyns, et al., 2015).

Drawing from established theories of memory, it stands to reason that placement, order, and format may play a role in the recall of risk information. Several prior studies have shown that reducing the cognitive load of a display increases individuals' ability to process the information in the display (Chandler & Sweller, 1991). Thus, the location of the risk information on a secondary webpage versus a primary webpage may result in reduced recall as people work harder to find it. Including a prominent signal to call out the risk information may draw attention and viewers may use a heuristic approach to information, determining that if there is a strong label, the referenced information must be important (Chaiken & Maheswaran, 1994). Schema theory (Brewer & Nakamura, 1984) suggests that individuals may have an expectation that the most important information is presented first—and on the first page of a web display. Thus, it is possible they will discount information that is provided only on a secondary webpage. Although researchers have suggested that ads do not convey warning information as effectively as information presented at the time of use because of the time delay between encoding and retrieval (Bettman, Payne, & Staelin, 1986), this information is still valuable to convey in promotional materials extolling the benefits of a prescription drug.

The Communication-Human Information Processing Model (C-HIP) provides a relevant framework (Conzola & Wogalter, 2001; Wogalter, 2006). Based on prior communication theories that discuss the importance of the source, channel, and receiver of a message, the C-HIP model includes several "receiver" steps: attention switch, attention maintenance, comprehension/memory, attitudes/beliefs, and motivation. According to this model, aspects of the message, such as placement, signaling, and formatting can affect attention, which in turn affects comprehension and attitudes/beliefs. For instance, prominent placement of a message or a signal indicating where to find the message can make it more likely that the individuals will switch their attention to the message. Clear formatting can make it more likely that individuals will maintain their attention.

This study had two primary objectives. First, given the limited research in this area, this study was designed to test whether placing risk information in different locations on branded

prescription drug websites would influence consumers' perceptions of the drug and knowledge of drug risks. Based on previous research, we tested three risk information visibility conditions: (1) presenting risk information on a standard homepage (with risk information located lower on the page), (2) presenting risk information on a homepage with a signal indicating its location lower on the page, and (3) presenting a hyperlink on the homepage which links to risk information on a secondary page. Because visitors to the website may see the homepage but never visit the secondary page (Zarcadoolas et al., 2002), we hypothesized that locating risk information on the homepage (with or without a signal) would lead consumers to recall more drug risks and to perceive the drug as riskier than locating risk information on a secondary page. We also hypothesized that including a signal on the homepage would lead consumers to recall more drug risks and to perceive the drug as riskier compared to a standard homepage.

Second, this study was designed to test whether the format of risk information would influence consumers' perceptions of the drug and knowledge of drug risks. In this study we examined four risk formats: paragraph, bulleted list, checklist, and highlighted box. Based on previous formatting and web navigation research (Khan & Locatis, 1998; Morrow et al., 1998; Raynor & Dickinson, 2009; Summers & Summers, 2005; U.S. Department of Health and Human Services & U.S. General Services Administration, 2006), we expected lists and highlighting to draw and keep participants' attention on the risk information and reduce the cognitive load of the risk information, which in turn would increase risk retention and perceptions. Specifically, we hypothesized that presenting risk information in a bulleted list or checklist would lead consumers to recall more drug risks and to perceive the drug as riskier than presenting risk information in a standard paragraph. We also hypothesized that presenting risk information in a highlighted box would lead consumers to recall more drug risks and to perceive the drug as riskier than presenting risk information in a paragraph, bulleted list, or checklist.

Methods

Design

We conducted a 3×5 experimental study that manipulated both the location and the format of risk information on DTC websites for two fictitious prescription drugs. For generalizability of results, we conducted the study with two different samples: participants diagnosed with high cholesterol (asymptomatic condition) and participants diagnosed with seasonal allergies (symptomatic condition). Participants viewed a DTC website for a fictitious prescription drug indicated to treat their condition—high cholesterol (*Pexacor*) or seasonal allergies (*Glistell*)—and then completed a brief online survey assessing recall, product perceptions, and other constructs. Each website had the following three pages: a homepage, a subpage on how the drug works (“About [DRUG X]”), and a subpage with tips for managing the health condition (“Patients Taking [DRUG X]”).

As part of the experimental design, we randomly assigned participants to one of three risk information visibility conditions: homepage, signal, or secondary page (Figures 1, 2, and 3). In the homepage condition, the risk information was presented below the benefit information on the homepage. In the signal condition, this same homepage had a red banner stating

“Please see Important Safety Information below” centered below the website headline and above the benefit information. In the secondary page condition, the risk information on the homepage was replaced with a link (“Please see Important Safety Information by visiting this link”) that led participants to a second webpage containing only the risk information.

We also randomly assigned participants to one of five risk information format conditions: paragraph, bulleted list, checklist, highlighted box, and video spokesperson (Figure 4). This resulted in a fully-crossed three (risk information visibility) by five (risk information format) design in both medical condition samples. Because of a programming error, participants in the secondary page/spokesperson conditions were terminated if they did not visit the secondary page. Therefore, we conducted analyses without the spokesperson conditions in a 3 (risk information visibility) by 4 (risk information format) design. Analyses with the spokesperson condition are not presented here.

Participants

We recruited participants from Knowledge Networks’ (now GfK) nationally representative online consumer panel of U.S. adults. Knowledge Networks’ panelists are randomly sampled from the U.S. adult population using random digit dialing and address-based sampling (DiSogra, Cobb, Chan, & Dennis, 2011; GfK Custom Research, 2013). Adult panelists who were pre-screened for high cholesterol ($n = 10,125$) or seasonal allergies ($n = 10,904$) were invited to participate in this study. Participants had to respond to the invitation, consent to participate, confirm their eligibility (i.e., medically diagnosed with high cholesterol or seasonal allergies and either still had the condition or had taken medication for it in the past 12 months), view the website successfully, and complete the survey. This resulted in a sample of 2,609 high cholesterol participants and 2,637 seasonal allergy participants for the analyzed conditions. See Table 1 for participant characteristics. Table 2 presents sample sizes per experimental condition, which were based on *a priori* power analyses.

Procedure

The study was conducted online, at a time and place of the participants’ choosing. Once they were deemed eligible, we instructed participants to review the assigned website carefully, and they were able to view it for as long as desired. After they viewed the website, we directed participants to complete a brief online survey containing the questions summarized in the next section. Participants could not return to the fictitious drug website once they finished viewing it.

Measures

We recorded the amount of time participants spent on the homepage. In the secondary page condition, we recorded the number of participants who visited the secondary page and the amount of time participants spent on it. Because participants completed the study online, they could leave the study and come back to it at a later time. Therefore, the timing variables were highly positively skewed. For analyses with timing variables, we excluded outliers for each variable, defined as any value larger than the third quartile plus 1.5 times the

interquartile range. This created variables that had a mean roughly equal to the median of the full sample.

For *risk recall*, we asked participants to list the side effects and negative outcomes of the drug. Two team members independently coded the open-ended responses, and we summed the number of correct risks to create a measure of risk recall (high cholesterol: range = 0 to 12, kappa = .95; seasonal allergies: range = 0 to 10, kappa = .93). We also measured *risk recognition* by presenting participants with eight statements about the drug and asking whether or not each statement was mentioned on the website as a risk of the drug. Four of the statements were actual risks (e.g., “Glistell can make it difficult to concentrate”), and four statements were not risks (e.g., “A side effect of Glistell is nausea”). We summed the number of correct responses to create a measure of risk recognition (0–8). We treated participants who skipped the risk recall and risk recognition measures as retaining no risk information by coding missing responses as 0.

We measured *perceived risk* with three items. First, we asked participants how many people taking the drug (out of 100) would have any side effects (*perceived risk likelihood*). Because this variable was not normally distributed, we used a log transformation prior to analysis. Second, we asked participants how serious any side effects would be on a 6-point scale (1 = not at all serious, 6 = very serious; *perceived risk magnitude*). Third, we asked participants to consider both the risks and the benefits of the drug and to rate the drug on a 7-point scale (1 = risks outweigh benefits, 7 = benefits outweigh risks; *risk-benefit assessment*).

We also measured demographic variables of age, sex, race, ethnicity, and education. Although not discussed here, for exploratory purposes we also asked questions about efficacy perceptions and recall, drug attitudes, perceptions of the website, behavioral intentions, illness severity, time since diagnosis, current prescription drug use, health literacy (Chew et al., 2008), and web navigation skills (Novak, Hoffman, & Yung, 2000).

Analyses

We conducted two-way ANOVAs to test the main effects and interaction of risk information visibility and risk information format. If any effects were significant at $p < 0.05$, we conducted pairwise comparisons (t tests) to determine which conditions were significantly different. For these comparisons, we used Bonferroni-adjusted significance levels of $p < 0.017$ (0.05/3 risk information visibility comparisons) and $p < 0.008$ (0.05/6 risk information format comparisons), respectively. Finally, we explored website viewing behavior by conducting ANOVAs to determine whether (1) time spent on the homepage and secondary page was related to risk retention and risk perceptions and (2) time spent on the webpages was affected by risk information visibility and risk information format. Weighted data were used in all analyses to account for nonresponse, noncoverage, underrepresentation of minority groups, and other types of sampling and survey error.

Results

Risk recall

High cholesterol.—Participants in the high cholesterol population recalled an average of two risks of the advertised drug. Risk information visibility was a significant predictor of risk recall, $F(2, 2607) = 7.50, p = .001$ (see Table 3 for weighted means of all dependent variables by risk information visibility condition). Specifically, participants in the homepage and signal conditions recalled more risks than participants in the secondary page condition, $F(1, 1730) = 13.15, p < .001, d = .17$, and $F(1, 1745) = 9.28, p = .002, d = .15$, respectively. However, risk information format and the interaction between risk information visibility and risk information format were not associated with risk recall, $p > .05$ (see Table 4 for weighted means of all dependent variables by risk information format condition).

Seasonal allergies.—Participants in the seasonal allergy population recalled, on average, one and a half risks of the advertised drug. Risk information visibility was a significant predictor of risk recall, $F(2, 2635) = 3.53, p = .03$. Specifically, participants in the signal condition recalled more risks than participants in the secondary page condition, $F(1, 1750) = 7.05, p = .01, d = .13$. However, risk information format and the interaction between risk information visibility and risk information format were not associated with risk recall, $p > .05$.

Risk recognition

High cholesterol.—In the high cholesterol population, participants correctly answered an average of five (out of eight) risk recognition statements. Risk information visibility was a significant predictor of risk recognition, $F(2, 2607) = 20.06, p < .001$. Specifically, participants in the homepage and signal conditions correctly recognized more risks than participants in the secondary page condition, $F(1, 1730) = 37.82, p < .001, d = .30$, and $F(1, 1745) = 24.48, p < .001, d = 0.24$, respectively. However, risk information format was not associated with risk recognition, and the interaction between risk information visibility and risk information format was not associated with this outcome either, $p > .05$.

Seasonal allergies.—In the seasonal allergy population, participants also correctly answered an average of five (out of eight) risk recognition statements. However, the risk information visibility and risk information format were not associated with risk recognition, $p > .05$.

Perceived risk

High cholesterol.—Participants in the high cholesterol population rated the drug as likely to cause side effects for a minority of people taking the drug ($Med = 14$ out of 100 people), rated those side effects as moderately serious ($M = 3.81$), and rated the drug as having more benefits than risks ($M = 4.61$). However, risk information visibility and risk information format were not associated with any of these outcomes, $p > .05$.

Seasonal allergies.—Participants in the seasonal allergy population rated the drug as likely to cause side effects for a minority of people taking the drug ($Med = 9$ out of 100

people), rated those side effects as moderately serious ($M = 3.27$), and rated the drug as having more benefits than risks ($M = 4.93$). Risk information visibility was a significant predictor of perceived risk magnitude, $F(2, 2590) = 3.31$, $p = .03$. Specifically, participants in the signal condition perceived the drug's risks as more serious than participants in the secondary page condition, $F(1, 1724) = 6.45$, $p = .01$, $d = .12$. However, risk information visibility was not associated with perceived risk likelihood or risk-benefit assessment, $p > .05$, and risk information format also was not associated with any perceived risk outcomes, $p > .05$.

Website Viewing Behavior

High cholesterol.—In the high cholesterol population, the median time spent on the homepage was 1.52 minutes. Participants in the homepage and signal conditions spent almost 2 minutes on the homepage ($Med = 1.83$ and $Med = 1.83$, respectively), which was noticeably longer than participants in the secondary page condition, who spent only about 1 minute on the homepage ($Med = 1.07$ minutes). In the secondary page condition, almost two-thirds of participants (63.7%) visited the secondary page, and these participants spent a median of 1.12 minutes viewing that page.

Time spent on the homepage and time spent on the secondary page (for those who visited the secondary page) significantly positively predicted risk recall and risk recognition, $p < .001$. However, the signal did not affect the amount of time spent on the homepage, and risk information format did not affect time on the homepage or on the secondary page, $p > .05$.

Seasonal allergies.—In the seasonal allergy population, the median time spent on the homepage was 1.27 minutes. Participants in the homepage and signal conditions spent approximately 1.5 minutes on the homepage ($Med = 1.48$ minutes, $Med = 1.45$ minutes, respectively), which again was noticeably longer than participants in the secondary page condition, who spent only about 1 minute on the homepage ($Med = 0.97$ minutes). In the secondary page condition, almost two-thirds of participants (65.0%) visited the secondary page, and these participants spent a median of 0.75 minutes viewing that page.

Time spent on the homepage significantly positively predicted risk recall ($p < .001$), risk recognition ($p < .001$), and perceived risk likelihood ($p = .03$). Time spent on the secondary page (for those who visited the secondary page) significantly positively predicted risk recall ($p = .005$) and risk recognition ($p = .001$). However, the signal did not affect the amount of time spent on the homepage, and risk information format did not affect time on the homepage or on the secondary page, $p > .05$.

Discussion

The most important finding of this study is that over a third of participants assigned to view a website with drug risk information on a secondary page did not click the link to view this information, which led to lower retention of the drug's risks. These findings demonstrate that placing drug risk information on a secondary page may, in some cases, result in an unbalanced presentation of benefit and risk information. The risk recognition results may not

have replicated in the seasonal allergies population because participants may have perceived seasonal allergies as a less serious condition and thus were less likely to read the risk information. It also may be that participants thought they were more familiar with the risks of seasonal allergy drugs through their experience with both prescription and over-the-counter medications and, therefore, were less likely to read the risk information regardless of where it was presented (Hoy & Levenshush, 2014). Future research with more serious medical conditions or prescription drugs with more serious risks could address this question.

We also tested a signal that directed participants to risk information on the homepage. The signal had little effect, although seasonal allergy participants who saw the signal did perceive the drug's risks as more serious than participants assigned to the secondary page condition. The signal's lack of influence is surprising given previous theory (Conzola & Wogalter, 2001; Wogalter, 2006) and research (e.g., Lorch & Lorch, 1995; 1996) on this strategy, which suggests that signals direct readers' attention to pertinent information and help them to recall it. One possible explanation is that the use of headings for the risk information in all conditions (i.e., "What risks are associated with [Glistell/Pexacor]" and "Who can take [Glistell/Pexacor]") may have inadvertently acted as a signal and made the additional signal unnecessary. Given that many consumers visit prescription drug websites (Choi & Lee, 2007; DeLorme, Huh, & Reid, 2010), it also is possible that consumers already know that risk information often appears below screen and did not require a signal to locate the information. Finally, these results may be caused by the specific website design we used; it is possible that participants did not see the signal (when asked as part of a manipulation check, 54–61% of participants in the signal condition correctly recalled the signal's presence) or that participants' screen resolutions (which cannot be controlled) presented the risk information above screen, rendering the signal unnecessary. This study did not have a direct measure of attention; therefore eye tracking data describing what information participants pay attention to when viewing a prescription drug website would help clarify why the signal did not have an effect.

It also is surprising that we did not find significant effects for risk information format. Although the bulleted list and checklist formats were fairly similar, they differed greatly from the paragraph format, and none of these formats used the bright background of the highlighted text box. However, these results are similar to another study that did not find effects for highlighting the "black box warning" on a prescription drug website (Kees, Bone, Kozup, & Ellen, 2008). It is possible that these formats were not engaging enough to draw or maintain participants' attention, that the overall website (including benefit information) was not complex enough, or that the risk information was not long or dense enough (particularly in the seasonal allergy conditions) to manifest a processing difference. Finally, previous research on formatting directed participants to search for specific information whereas our study employed a free-reading exercise (Morrow et al., 1998). It is possible that the absence of a specific task led participants to scan the information briefly—a typical online reading behavior—and did not leverage the advantages of the non-paragraph formats.

As with other studies, differences in recall and recognition did not translate into differences in perceptions (Aikin, O'Donoghue, Swasy, & Sullivan, 2011; O'Donoghue, Sullivan, Aikin, Chowdhury, Moultrie, & Rupert, 2014). It is important to remember that participants viewed

the website only once, as part of an experimental study. Consumers viewing websites when actively seeking treatment information may react differently. Likewise, a single website exposure may lead to recall and recognition effects but may not change people's perceptions in the same way as repeated exposures or a sustained advertising campaign.

The C-HIP model predicts that the placement, signaling, and formatting of risk information will affect attention, which in turn will affect comprehension/memory and attitudes/beliefs (Conzola & Wogalter, 2001; Wogalter, 2006). In this study, we found evidence that placement, but not signaling and formatting, had an effect. The study's results suggest that placing risk information on the homepage may be an important step in ensuring that prescription drug websites adequately inform consumers about drug risks. We found evidence that participants had less knowledge of drug risks when the risk information was placed on a secondary page. Based on these findings, we recommend that, to have "fair balance," drug risk information should be placed on the homepage when benefits are presented on the homepage (Prescription Drug Advertisements, 2012). We did not find sufficient evidence to support requiring a signal near the top of the homepage directing participants to the risk information. We also did not find evidence that any of the risk information formats improved knowledge of drug risks, suggesting that, among the various user-friendly formats we tested, there may not be a need for recommending specific risk information formats on prescription drug websites.

Acknowledgments

The study presented in this manuscript was provided an exemption from FDA's Research Involving Human Subjects Committee. Funding was provided by the Office of Prescription Drug Promotion, U.S. Food and Drug Administration and data were collected through a contract with RTI International. Jessica Fitts Willoughby was a contractor with RTI International at the time this study was conducted. We thank the following employees of RTI International for their assistance: Kayla Gray, Scott Boggs, Elizabeth Robbins, Maria Ashbaugh (stimuli development), Sarah Kandefer, Annette Green, Paul Mosquin, Grier Page (data and analyses), Jacqueline Amoozegar, Jennifer Gard Read, Bridget Kelly, and Rebecca Moultrie (questionnaire development and cognitive interviews).

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Glistell Home About GLISTELL Patients Taking GLISTELL

Tired of Seasonal Allergies?
Ask your doctor about GLISTELL.

If you start sniffing and sneezing when spring, summer, or fall arrives in your area, you may suffer from seasonal allergies, also known as hay fever or allergic rhinitis. GLISTELL (loratadine) is a long-acting once-daily antihistamine combined with a decongestant. This time-released tablet can relieve the following common seasonal allergy symptoms: nasal congestion, runny nose; sneezing; itchy nose and throat; and watery, itchy, or red eyes.

What Does GLISTELL Do?
GLISTELL can relieve the symptoms of seasonal allergies such as runny nose; sneezing; itchy nose and throat; and watery, itchy, or red eyes.

What Risks Are Associated with GLISTELL?
A very serious allergic reaction to GLISTELL is rare. Seek immediate medical attention if you notice symptoms of a serious allergic reaction, such as a rash, severe dizziness, trouble breathing, or itching or swelling (especially around your face, tongue, or throat). Do not give GLISTELL to children younger than two years old unless directed to by your doctor.

As a precaution, talk to your doctor before taking GLISTELL if you have high blood pressure, an overactive thyroid, or an enlarged prostate. People with these conditions may need different doses of GLISTELL.

GLISTELL can make it difficult to concentrate. Do not drive, use machinery, or do any activity that requires concentration until you are sure you can perform these types of activities safely.

Who Can Take GLISTELL?
GLISTELL is prescribed for individuals who suffer from seasonal allergies and have symptoms such as nasal congestion, runny nose; sneezing; itchy nose and throat; and watery, itchy, or red eyes.

Do not use this medication in children younger than two years of age unless directed by your doctor.

Figure 1.
Seasonal allergies website for the homepage/paragraph condition

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Glistell Home About GLISTELL Patients Taking GLISTELL

Tired of Seasonal Allergies?

Ask your doctor about GLISTELL.

Please see Important Safety Information below.

If you start sniffing and sneezing when spring, summer, or fall arrives in your area, you may suffer from seasonal allergies, also known as hay fever or allergic rhinitis. GLISTELL (loratadine) is a long-acting once-daily antihistamine combined with a decongestant. This time-released tablet can relieve the following common seasonal allergy symptoms: nasal congestion, runny nose, sneezing, itchy nose and throat, and watery, itchy, or red eyes.

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Figure 2.
Seasonal allergies website for the signal/paragraph condition

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The image shows a screenshot of the Glistell website. At the top, there is a navigation bar with the Glistell logo (a green leaf-like shape) and the word 'Home' next to it. To the right of the logo are two links: 'About GLISTELL' and 'Patients Taking GLISTELL'. Below the navigation bar is a large banner image. The banner features a woman and a young girl sitting outdoors, smiling and looking at a small potted plant. The woman is wearing a white shirt, and the girl is also wearing a white shirt. There are several other potted plants with yellow and orange flowers around them. The background is a lush green garden. Overlaid on the banner is the text 'Tired of Seasonal Allergies?' in a large, white, serif font. Below this text is a smaller line of text in a yellow, sans-serif font that says 'Ask your doctor about GLISTELL.'. To the right of the banner, there are several large, stylized, yellow, spiky shapes that look like pollen grains or dandelion seeds. Below the banner, there is a white background with text. The text is organized into sections with bold headings. The first section is titled 'What Does GLISTELL Do?' in bold green text. Below this heading is a paragraph of text in a small, black, sans-serif font. The second section is titled 'What Risks Are Associated with GLISTELL?' in bold green text. Below this heading is a paragraph of text in a small, black, sans-serif font, which includes a link to 'Important Safety Information'. The third section is titled 'Who Can Take GLISTELL?' in bold green text. Below this heading is a paragraph of text in a small, black, sans-serif font. At the bottom of the page, there is a small, black, sans-serif font paragraph that says 'Do not use this medication in children younger than two years of age unless directed by your doctor.'

Home About GLISTELL Patients Taking GLISTELL

Tired of Seasonal Allergies?
Ask your doctor about GLISTELL.

If you start sniffing and sneezing when spring, summer, or fall arrives in your area, you may suffer from seasonal allergies, also known as hay fever or allergic rhinitis. GLISTELL (loratadine) is a long-acting once-daily antihistamine combined with a decongestant. This time-released tablet can relieve the following common seasonal allergy symptoms: nasal congestion, runny nose; sneezing; itchy nose and throat; and watery, itchy, or red eyes.

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What Risks Are Associated with GLISTELL?
[Please see Important Safety Information by visiting this link.](#)

Who Can Take GLISTELL?
GLISTELL is prescribed for individuals who suffer from seasonal allergies and have symptoms such as nasal congestion; runny nose; sneezing; itchy nose and throat; and watery, itchy, or red eyes.

Do not use this medication in children younger than two years of age unless directed by your doctor.

Figure 3.
Seasonal allergies website for the secondary page/paragraph condition

<p>What Risks Are Associated with PEXACOR?</p> <p>PEXACOR is not for everyone, including people with liver problems and women who are nursing, pregnant, or may become pregnant. You need simple blood tests to check for liver problems while taking PEXACOR.</p> <p>If you develop fever, unexplained weakness, or confusion, tell your doctor right away as these may be signs of a rare but potentially life-threatening condition called thrombotic thrombocytopenic purpura (TTP). Sometimes TTP has been reported less than two weeks after starting therapy. Tell your doctor if you have any muscle pain or weakness, as this may be a sign of another rare but serious side effect.</p> <p>Common side effects of PEXACOR include diarrhea, joint pain, and tiredness. Tell your doctor if you are taking any other medications.</p> <p>People of Asian descent may absorb PEXACOR into their systems more rapidly than others. Inform your doctor if you have any Asian heritage, because your starting dosage may need to be adjusted.</p> <p>PEXACOR can cause birth defects. Do not take PEXACOR if you are pregnant. It is important to use effective birth control to avoid pregnancy while you are taking PEXACOR. If you become pregnant, stop taking PEXACOR and notify your physician immediately. Do not breast-feed while you are taking PEXACOR.</p>	<p>What Risks Are Associated with PEXACOR?</p> <p>PEXACOR is not for everyone, including people with liver problems and women who are nursing, pregnant, or may become pregnant. You need simple blood tests to check for liver problems while taking PEXACOR.</p> <p>If you develop fever, unexplained weakness, or confusion, tell your doctor right away as these may be signs of a rare but potentially life-threatening condition called thrombotic thrombocytopenic purpura (TTP). Sometimes TTP has been reported less than two weeks after starting therapy. Tell your doctor if you have any muscle pain or weakness, as this may be a sign of another rare but serious side effect.</p> <p>Common side effects of PEXACOR include diarrhea, joint pain, and tiredness. Tell your doctor if you are taking any other medications.</p> <p>People of Asian descent may absorb PEXACOR into their systems more rapidly than others. Inform your doctor if you have any Asian heritage, because your starting dosage may need to be adjusted.</p> <p>PEXACOR can cause birth defects. Do not take PEXACOR if you are pregnant. It is important to use effective birth control to avoid pregnancy while you are taking PEXACOR. If you become pregnant, stop taking PEXACOR and notify your physician immediately. Do not breast-feed while you are taking PEXACOR.</p>
<p>What Risks Are Associated with PEXACOR?</p> <ul style="list-style-type: none"> ● PEXACOR is not for everyone. Don't take PEXACOR if you: <ul style="list-style-type: none"> ○ Have liver problems ○ Are nursing, pregnant, or may become pregnant ● You need simple blood tests to check for liver problems while taking PEXACOR ● Tell your doctor right away if you notice signs of thrombotic thrombocytopenic purpura (TTP), a rare but life-threatening condition. These signs include: <ul style="list-style-type: none"> ○ Fever ○ Unexplained weakness ○ Confusion ● Sometimes, TTP has been reported less than two weeks after starting therapy. ● Tell your doctor if you have any muscle pain or weakness, as this may be a sign of another rare but serious side effect. ● Common side effects of PEXACOR include: <ul style="list-style-type: none"> ○ Diarrhea ○ Joint pain ○ Tiredness ● Tell your doctor if you are taking any other medications. ● People of Asian descent might absorb PEXACOR more rapidly. Inform your doctor if you have any Asian heritage because your starting dosage may need to be adjusted. ● PEXACOR can cause birth defects: <ul style="list-style-type: none"> ○ Do not take PEXACOR if pregnant. ○ Use effective birth control while taking PEXACOR. ○ If you become pregnant, stop taking PEXACOR and notify your physician immediately. ○ Do not breast-feed while taking PEXACOR. 	<p>What Risks Are Associated with PEXACOR?</p> <ul style="list-style-type: none"> ✓ PEXACOR is not for everyone. Don't take PEXACOR if you: <ul style="list-style-type: none"> ● Have liver problems ● Are nursing, pregnant, or may become pregnant ✓ You need simple blood tests to check for liver problems while taking PEXACOR. ✓ Tell your doctor right away if you notice signs of thrombotic thrombocytopenic purpura (TTP), a rare but life-threatening condition. These signs include: <ul style="list-style-type: none"> ● Fever ● Unexplained weakness ● Confusion ✓ Sometimes, TTP has been reported less than two weeks after starting therapy. ✓ Tell your doctor if you have any muscle pain or weakness, as this may be a sign of another rare but serious side effect. ✓ Common side effects of PEXACOR include: <ul style="list-style-type: none"> ● Diarrhea ● Joint pain ● Tiredness ✓ Tell your doctor if you are taking any other medications. ✓ People of Asian descent might absorb PEXACOR more rapidly. Inform your doctor if you have any Asian heritage because your starting dosage may need to be adjusted. ✓ PEXACOR can cause birth defects: <ul style="list-style-type: none"> ● Do not take PEXACOR if pregnant. ● Use effective birth control while taking PEXACOR. ● If you become pregnant, stop taking PEXACOR and notify your physician immediately. ● Do not breast-feed while taking PEXACOR.

Figure 4.
Examples of the format conditions from the high cholesterol website
Clockwise from top left: paragraph, highlighted box, checklist, bulleted list

Table 1

Participant characteristics: weighted number (%)

	High Cholesterol Population	Seasonal Allergies Population
Self-reported diagnosis	2609 (100%)	2637 (100%)
Sex		
Male	1307 (50.1%)	921 (34.9%)
Female	1302 (49.9%)	1716 (65.1%)
Race		
White	2176 (83.4%)	2120 (80.4%)
Black	230 (8.8%)	244 (9.3%)
Other	203 (7.8%)	273 (10.4%)
Ethnicity		
Hispanic	193 (7.4%)	316 (12.0%)
Not Hispanic	2416 (92.6%)	2321 (88%)
Education		
Less than high school	118 (4.5%)	116 (4.4%)
High school degree	933 (35.8%)	742 (28.1%)
Some college	749 (28.7%)	825 (31.3%)
Bachelor's degree or higher	809 (31.0%)	954 (36.2%)
Age		
18–34	73 (2.8%)	462 (17.5%)
35–44	179 (6.9%)	514 (19.5%)
45–54	386 (14.8%)	511 (19.4%)
55–64	868 (33.3%)	593 (22.5%)
65+	1103 (42.3%)	557 (21.1%)

Table 2

Number of participants per condition

Risk information visibility	Risk information format				
High cholesterol population	Paragraph	Bullet List	Checklist	Highlighted Box	Total
Homepage	217	208	240	198	863
Signal	211	247	218	202	878
Secondary page	235	221	204	208	868
Total	663	676	662	608	2609
Seasonal allergies population					
Homepage	215	245	218	208	886
Signal	202	210	228	224	864
Secondary page	243	228	208	208	887
Total	660	683	654	640	2637

Table 3

Weighted mean (standard error) for risk recall, recognition, and perceptions by risk information visibility condition

	Homepage	Signal	Secondary Page
High cholesterol population			
Risk recall	2.22 (0.08) *	2.13 (0.08) *	1.76 (0.09)
Risk recognition	5.65 (0.09) *	5.50 (0.09) *	4.79 (0.11)
Perceived risk likelihood	24.66 (1.28)	20.78 (0.97)	23.71 (1.23)
Perceived risk magnitude	3.82 (0.07)	3.82 (0.06)	3.80 (0.06)
Risk-benefit assessment	4.55 (0.06)	4.69 (0.07)	4.57 (0.06)
Seasonal allergies population			
Risk recall	1.52 (0.07)	1.66 (0.08) *	1.38 (0.08)
Risk recognition	5.65 (0.09)	5.60 (0.09)	5.39 (0.09)
Perceived risk likelihood	15.96 (1.01)	15.79 (0.99)	16.82 (0.92)
Perceived risk magnitude	3.27 (0.07)	3.40 (0.08) *	3.15 (0.06)
Risk-benefit assessment	4.93 (0.07)	4.90 (0.07)	4.96 (0.06)

Note. Risk recall was assessed on a scale of 0–12 correct for high cholesterol and 0–10 correct for seasonal allergies. For measures in both populations, risk recognition = 0–8 correct, perceived risk likelihood = 0–100 people, perceived risk magnitude = 1 (not at all serious) to 6 (very serious), and risk-benefit assessment = 1 (risks outweigh benefits) to 7 (benefits outweigh risks). Although a transformation of perceived risk likelihood was used in analyses, the untransformed weighted means are presented here for ease of interpretation.

* = significantly different from secondary page condition at Bonferroni-adjusted $p < .017$.

Table 4

Weighted mean (standard error) for risk recall, recognition, and perceptions by risk information format condition.

	Paragraph	Bulleted List	Checklist	Highlighted Box
High cholesterol population				
Risk recall	1.94 (0.10)	2.08 (0.10)	2.13 (0.10)	1.98 (0.10)
Risk recognition	5.21 (0.12)	5.43 (0.12)	5.35 (0.12)	5.25 (0.11)
Perceived risk likelihood	22.56 (1.35)	22.05 (1.20)	24.70 (1.56)	22.82 (1.27)
Perceived risk magnitude	3.78 (0.07)	3.77 (0.07)	3.91 (0.07)	3.79 (0.07)
Risk-benefit assessment	4.72 (0.07)	4.54 (0.07)	4.48 (0.08)	4.69 (0.08)
Seasonal allergies population				
Risk recall	1.68 (0.09)	1.56 (0.08)	1.47 (0.09)	1.36 (0.10)
Risk recognition	5.76 (0.10)	5.38 (0.10)	5.57 (0.11)	5.49 (0.10)
Perceived risk likelihood	15.97 (1.19)	15.77 (1.01)	16.80 (1.08)	16.28 (1.20)
Perceived risk magnitude	3.29 (0.09)	3.27 (0.07)	3.23 (0.07)	3.29 (0.09)
Risk-benefit assessment	5.03 (0.07)	4.86 (0.08)	4.98 (0.07)	4.85 (0.09)

Note. Risk recall was assessed on a scale of 0–12 correct for high cholesterol and 0–10 correct for seasonal allergies. For measures in both populations, risk recognition = 0–8 correct, perceived risk likelihood = 0–100 people, perceived risk magnitude = 1 (not at all serious) to 6 (very serious), and risk-benefit assessment = 1 (risks outweigh benefits) to 7 (benefits outweigh risks). Although a transformation of perceived risk likelihood was used in analyses, the untransformed weighted means are presented here for ease of interpretation.