

# Consumer Satisfaction to Laboratory Test Interpretation by the ASCLS Response Team

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**OBJECTIVE:** To assess consumer satisfaction to responses to laboratory test interpretations as provided by the American Society for Clinical Laboratory Science (ASCLS) Consumer Response Team. Additional information studied included demographics, whether a response to the question was received, and the respective discipline related to the question.

**DESIGN:** A computerized questionnaire was sent to 339 participants who had sent questions concerning laboratory test results to the ASCLS consumer website ([www.ascls.org](http://www.ascls.org)) in May 2007. A total of 99 completed questionnaires (29.3%) provided usable data for analysis.

**SETTING:** Participants answered the questionnaire via electronic mail and results were summarized in Zoomerang.

**PARTICIPANTS:** Participants were national and international consumers who had sent a question regarding their laboratory results to the ASCLS website. Individuals were 18 years of age or older. Participation was voluntary and anonymous.

**MAIN OUTCOME MEASURES:** Consumer satisfaction, measured by eleven satisfaction statements, with laboratory interpretations by the ASCLS Response Team averaged 4.0 on the five-point Likert scale: 1 = Strongly disagree to 5 = Strongly agree. Overall satisfaction of the website itself was 4.2 on the five-point Likert scale 1 = Poor to 5 = Excellent.

**RESULTS:** The majority of respondents were female (71.1%) and ranged in age from 36-64 years (71.7%). Seventy-six percent of respondents reported they had received an answer to

their laboratory test question. The most frequent disciplines for questions received were in chemistry, immunology, and hematology, respectively.

**CONCLUSIONS:** This study indicates consumers of the ASCLS website were very satisfied with the clinical laboratory scientist volunteers' responses. The ASCLS Consumer Response Team model is contributing to the advancement of healthcare by providing this important service to the public.

**ABBREVIATIONS:** ASCLS = American Society for Clinical Laboratory Science.

**INDEX TERMS:** ASCLS; attitudes; consumer response team; e-Health; Internet; laboratory test interpretation; satisfaction.

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The emergence of Internet usage to provide answers to health-related questions goes beyond the scope of physician consultations and has become an alternative source of health-related information.<sup>1</sup> Ethical and privacy questions

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are of concern and may deter patients from trusting many prevalent Internet health sources.<sup>2</sup> Without being appropriately educated, and when patients request information such as laboratory test results with which they are unfamiliar, harmful false conclusions may be drawn.

In today's society, patients may no longer accept the traditional role of the physician as a sole "authoritative" figure. Proactive individuals want explanations for what is happening to themselves and their loved ones.<sup>3</sup> With increases in technology, data that were not provided years ago are currently available to patients, physicians, and other healthcare providers. Internet and email access increase information flow and many patients use these sources as an alternative to direct face-to-face involvement with health professionals, as well as an adjunct to information provided to them. Yet, there may be a hesitancy to trust such sources, because almost anyone can post information on any particular area that piques their interests. Some websites have established means of evaluation or "seals of approval", but in some instances methods to evaluate these websites are questionable.<sup>4</sup>

A gap in communications, therefore, has perhaps widened between healthcare professionals and proactive patients and even traditional patients as well. Such a gap can decrease when a program such as that of the American Society for Clinical Laboratory Science (ASCLS) website provides an alternative means to the interpretation of laboratory test values. Avoiding diagnostic implications, the website focuses on the scope of practice of clinical laboratory science, often referring patients back to their own physicians for further discussion.

Finding ways to enhance patient information flow and understanding can alleviate stress on a patient, and in many cases increase patient compliance, treatment adherence, quality of outcomes, etc.<sup>5</sup> Physicians and other healthcare professionals should be willing to step outside of the natural tendency to be "authoritative", and instead, guide patients in an individualized, personal manner.<sup>6</sup> Time constraints make it difficult to do this as schedules become tighter and tighter. Ultimately, it is the patient's health that can suffer ill effects due to the unknown.<sup>7</sup> Thus, online information can assist the physician and patient in better understanding one another, the conditions at hand, and what may be needed next.

As technology increases, being able to evaluate information that is currently available to patients with healthcare profes-

sionals' acceptance of this information, together with the patient-physician communicating about it and a patient's pro-active nature, may lead to an overall increase in satisfaction with and quality of their care. Evaluating programs such as the ASCLS website for laboratory result interpretation can provide insights into patients' perceptions of satisfaction, demographic data on participants, why individuals are visiting the website, and if consumers are receiving answers to their questions. Other websites such as this will surface, and this study may guide the evaluation of these websites.

### ASCLS CONSUMER INFORMATION WEBSITE BACKGROUND INFORMATION

Understanding laboratory test results can be daunting. In response in 1997, ASCLS created a website whereby consumers could ask questions about the interpretation of laboratory values, using a laboratory request form. The number of CLS volunteers who provide answers to consumers of the ASCLS website has grown rapidly. In 1997 there were 7 volunteers and in 2008 there are 49.

This website is the first interactive, non-subscription based, international service for consumers seeking laboratory interpretation information. It operates 24 hours a day, seven days a week, and 365 days a year. Consumers ask specific questions about laboratory results using the Internet. The number of questions has grown tremendously. In 1997 there was less than one question per day and in 2007 an average of 86 questions per day were received for a total of 32,000 inquiries.

In the past, ASCLS reported the largest area of questions asked were in chemistry, accounting for 60%-65% of overall questions. Following in rank were the areas of microbiology (15%-30%), hematology (15%-20%), and immunology (15%-20%) per month.

When accessing the ASCLS website, the following information is given to each consumer: an introduction, general information, and a question asking "Does the website visitor have a question about a laboratory test?" If the person does have a question, a short disclaimer concerning liability is read before a question may be submitted. A response to the question is generated typically within a 72 hour period; however, the panel tries to answer all questions within 48 hours, and if possible within 24 hours. The laboratory request form is standardized and accessed via electronic mail or the ASCLS website.

## MATERIALS AND METHODS

The sample population consisted of 339 participants (18 years and older) who sent a question to the ASCLS website during a two week period in May 2007. All participants who posted a question on this website were potential subjects for the study. Email addresses identified the participants to make their selection possible. In order to randomize the selection process, four numbers (1-4) were placed in a hat and one number was drawn. The number selected was a three. Every day for a two week period, lists of participant questions and e-mail addresses were printed out. All printouts were destroyed by a shredder after randomization to ensure confidentiality. The third person on the daily list was added to an Excel spreadsheet; every fourth person thereafter was added until the desired sample size was reached. This process was repeated daily for two weeks until reaching an appropriate sample size ( $n = 322$ ). Sample size was determined by a sample size calculator, stipulating a desired confidence interval and level ( $95\% \pm 5\%$ ).

The research design for this study was descriptive. Satisfaction was determined based on two different five-point Likert scales. The first was one question asking, "How would you rate your experience on this website?" Overall rating of the website was based on a five-point Likert scale ranging from 1 = Poor to 5 = Excellent. The scale for each of the 11 satisfaction statements regarding the Consumer Response Team reply ranged from 1 = Strongly disagree to 5 = Strongly agree for responses received. The 11 statements were designed by the author with input from the Consumer Response Team and a series of sample questionnaires provided in various healthcare literature sites. Content validity for the 11-question form in this study was determined by four experts in clinical laboratory science. A field test established face validity of the final questionnaire. Twenty-five participants and 10 consumer response volunteers determined clarity and suitability of the instrument.

Whether or not respondents reported an answer to their question was determined by a basic percentage of respondents. Demographic data collected included gender, age, geographic continent, and reason for visiting the website. Respondents were asked to rate their overall health on a five-point Likert scale ranging from 1 = Poor to 5 = Excellent. Generalization of results was determined by comparing early to late respondents through the use of cross tabulation with symmetric measures. Both Phi and Cramer's V measures were reported to determine significance, if any. Reliability of the instrument was measured by the Cronbach alpha.

## RESULTS

An e-mail questionnaire was sent to 339 participants who submitted a question regarding laboratory value(s) to the ASCLS website. Exclusion from the questionnaire included those individuals younger than 18 years of age. A total of 99 completed questionnaires (29.3%) provided usable data for analysis. Results were summarized in Zoomerang, an online software program used to create web-based questionnaires and tabulate results instantaneously upon completion of the survey.

**Table 1.** Assessing respondent satisfaction

Satisfaction Statement	Mean
The CLS used language I could understand.	4.6
I felt my privacy was respected while using this website.	4.6
I felt I could recommend this website to someone else.	4.4
I received a response to my question in a timely manner (72 hours or fewer).	4.3
I felt confidence in the professional who answered my question.	4.2
I felt trust in the professional who answered my question.	4.1
I was satisfied with the information received from my question.	4.0
I could discuss the information obtained with my doctor.	3.9
I felt more in control of my healthcare.	3.8
I found information on this website that I had not learned elsewhere.	3.5
I desired more information than I received.	3.1
<b>Average (mean) of respondents' scores</b>	<b>4.0</b>

1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly agree

Results indicated that, on average, respondents who received answers to their questions rated their overall website experience as 4.2 ( $n = 74$ ) on a five-point Likert scale of 1 = Poor to 5 = Excellent. Agreement with a series of 11 overall satisfaction statements averaged 4.0 on a five-point Likert scale of 1 = Strongly disagree to 5 = Strongly agree. See Table 1. The study found that approximately 76% of respondents reported they had received an answer to their laboratory test question.

Respondents rated their own overall health as 3.7 on a five-point Likert scale of 1 = Poor and 5 = Excellent. The primary reason why respondents visited the website was dominated by the option "self", which accounted for 59.6% of the respondents. Demographic data showed a predominance of females (71.7%); respondents between the ages of 36-64 years (71.7%); and from North America (78.8%). Search engines provided the primary source to finding the website (73.3%). The majority of respondents (89.9%) stated this was their first time accessing the website. The three main disciplines of clinical laboratory science represented by questions in the study were chemistry (53.5%), immunology (22.2%) and hematology (12.1%).

Generalization of results was based upon the comparison of early to late respondents on a series of measures. Research has indicated that such a comparison, once similarity has been established, can allow generalization of results to the entire population based upon stating that late respondents are like non-respondents.<sup>8</sup> Reliability of the instrument was established by a Cronbach alpha of 0.92.

## DISCUSSION

The overall favorable rating (4.0 of 5.0) given to the 11 satisfaction statements concerning the ASCLS Response Team suggests that this volunteer group is doing a fine job in responding to consumer inquiries. Consumers' satisfaction with the website itself was also outstanding (4.2). Such findings support the validity, confidence, and merit of the ASCLS Response Team and the ASCLS website.

One of the highest ranked (4.6) satisfaction statements indicated the CLS responders used language that the consumers could understand. This is critical as one translates technical and medical information into a usable language for the layperson. Consumers also believed their privacy was respected using this site. This is important as it suggests that consumers feel they can ask a question without fear of ridicule, disclosure, or judgment. Respondents felt comfortable

recommending this service (4.4) to others and in fact, this service has been shared with current disease-oriented listserv groups in areas such as cancer and multiple myeloma.

Answers were received in a timely manner (4.3) indicating the volunteer group understands the necessity of sending a reply, usually within 48 hours. This allows the consumer to have additional information when discussing health issues with a physician. Importantly, consumers felt more in control of their healthcare (3.8).

Nearly 76% of respondents received a reply to their question. This is somewhat disappointing, but when one considers spam filters that block replies and that this is a volunteer effort, 76% indicates the ASCLS Consumer Response Team is aptly serving the public interest.

The demographic data reveal some interesting innuendos. The majority of respondents were female (71%), between the ages of 36-64 years (71.7%), living in North America (78.8%), seeking health information for self (59.6%), and rating their overall health as 3.7 (out of 5). These data accurately correlate with the "Baby Boomer" population in the United States.<sup>9</sup>

This wave of baby boomers is reshaping the healthcare system. Seventy-eight million baby boomers were born in the US between 1946-1964. These individuals are living longer and are more engaged in their healthcare. The majority of respondents were women, who are typically the healthcare decision-makers in the family.<sup>10</sup> The age of the respondents reflected the baby boomer population. Boomers appear to be empowered to seek health information beyond the physician-patient interaction. Conducting health research online has become a mainstream activity of the boomers. This is a major reason the ASCLS website service has grown rapidly, from an average of one response daily in 1997 to 86 per day in 2007.

Consumers of this service are becoming more knowledgeable regarding their own health. In today's healthcare environment, the physician usually does not have the time to discuss every aspect of a medical condition, tests, and results. The clinical laboratory scientist is therefore fulfilling a professional role that we are educated to perform, that of communicating and interpreting laboratory test data to the consumer. The consumer is thus better able to interpret what the physician is saying and to better ask pertinent questions. This further supports the need for a Doctorate in Clinical Laboratory Sci-



ence as the vehicle to further engage laboratorians as members of the healthcare team. This is a win-win situation for the patient, physician, and clinical laboratory scientist.

## CONCLUSIONS

This study indicates that consumers of the ASCLS website ([www.ascls.org](http://www.ascls.org)) are very satisfied with the responses received from clinical laboratory scientist volunteers to their questions concerning laboratory test values. The ASCLS Response Team is a model that can be emulated by other health professionals in advancing healthcare in this country and others. The increasing utilization of this consumer education service partially and indirectly supports the need for a Doctorate of Clinical Laboratory Science practitioner to interface with physicians, nurses, pharmacists, and patients themselves.

**INTERESTED IN JOINING THE ASCLS CONSUMER RESPONSE TEAM?** Please contact: Susan J Leclair PhD CLS(NCA), Department of Medical Laboratory Science, University of Massachusetts Dartmouth. [sleclair@umassd.edu](mailto:sleclair@umassd.edu).

## REFERENCES

1. Coile R. e-Health: Reinventing healthcare in the information age. *J Healthcare Management* 2000;45:206-10.
2. Tieman J. e-Healthcare still has some glitches. *Health Source* 2000;30:42.
3. Runy LA. Study sees little consumer internet health use beyond information search. *AHA News* 2000;36:8.
4. Gagliardi A, Jadad A. Examination of instruments used to rate quality of health information on the internet: chronicle of a voyage with an unclear destination. *BMJ* 2002;324:569-73.
5. Rao J, Weinberger M, Kroenke K. Visit-specific expectations and patient-centered outcomes. *Arch Fam Med* 2000;9:1148-55.
6. Trachtenberg F, Dugan E, Hall A. How patients trust relates to their involvement in medical care. *J Fam Pract* 2005;54:344-52.
7. Dugdale DC, Epstein R, Pantilat S. Time and the patient-physician relationship. *Time management. J Gen Intern Med* 1999;14:S34-40.
8. Clausen JA, Ford R. Controlling bias in mail questionnaires. *J Am Stat Assoc* 1947;42:497.
9. American Hospital Association. When I'm 64: how boomers will change health care. Available from <http://www.aha.org/aha/content/2007/pdf/070508-boomerreport.pdf>. Accessed 2007 Jan 21.
10. Sacramento Business Journal. Hospitals target women as the decision-makers. Available from <http://www.bizjournals.com/sacramento/stories/1998/06/08/focus2.html>. Accessed 2007 Jan 21.

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