



## PHS PUBLIC ACCESS

Author manuscript

*Eye Contact Lens*. Author manuscript; available in PMC 2015 May 21.

Published in final edited form as:

*Eye Contact Lens*. 2014 March ; 40(2): 111–115. doi:10.1097/ICL.000000000000020.

## Perceptions of Dry Eye Disease Management in Current Clinical Practice

Jennifer F. Williamson, M.D., Kyle Huynh, B.S., Mark A. Weaver, Ph.D., and Richard M. Davis, M.D

University of North Carolina School of Medicine (J.F.W.), Chapel Hill, NC; Department of Internal Medicine (J.F.W.), New Hanover Regional Medical Center, Wilmington, NC; George Washington University School of Medicine (K.H.), Washington, DC; Doris Duke Clinical Research Fellow (K.H.), University of North Carolina, Chapel Hill, NC; Department of Medicine (M.A.W.), Division of General Medicine and Epidemiology, University of North Carolina, Chapel Hill, NC; and Department of Ophthalmology (R.M.D.), University of North Carolina, Chapel Hill, NC

### Abstract

**Objective**—To assess the perceptions of eye care providers regarding the clinical management of dry eye.

**Methods**—Invitations to complete a 17-question online survey were mailed to 400 members of the North Carolina Ophthalmology and Optometry Associations including community optometrists, comprehensive ophthalmologists, and cornea specialists.

**Results**—The survey was completed by 100 eye care providers (25% response rate). Providers reported burning (46.5%) as the most frequent symptom described by patients, followed by foreign body sensation (30.3%) and tearing (17.2%). Most respondents (80.8%) listed artificial tears as the recommended first-line treatment, even though providers reported high failure rates for both artificial tears and cyclosporine A (Restasis). Rheumatoid arthritis, Sjögren syndrome, affective disorders such as anxiety and depression, history of photorefractive surgery, smoking, and thyroid disease were acknowledged as common comorbid conditions.

**Conclusions**—The survey provided an informative snapshot into the preferences of eye care providers concerning the diagnosis and management of dry eye disease. Overall, burning was the most common symptom reported by patients. Providers relied more on patient history in guiding their clinical decisions than objective signs. The survey underscores the incongruence when comparing subjective symptoms with objective signs, thereby highlighting the urgent need for the development of reliable metrics to better quantify dry eye symptoms and also the development of a more sensitive and specific test that can be used as the gold standard to diagnose dry eye.

---

© 2014 Contact Lens Association of Ophthalmologists

Address correspondence to Richard M. Davis, M.D., Department of Ophthalmology, University of North Carolina, 5151 Bioinformatics, CB 7040, Chapel Hill, NC 27599-7040; richard\_davis@med.unc.edu.

The authors have no funding or conflicts of interest to disclose.

## Keywords

Dry eye; Keratoconjunctivitis sicca; Tear osmolarity; Diagnostic tests; Survey; Treatment strategies

Epidemiologic studies reveal that dry eye disease (DED), or keratoconjunctivitis sicca, has a prevalence ranging from 7.8% to 14.6% in the United States. It affects approximately 4.91 million Americans aged 50 years and older, although the exact prevalence is unknown because of the variance in the definition of the disease.<sup>1</sup> The challenge that eye care providers face is the complexity of managing DED without a discreet laboratory measure by which to monitor the disease status, such as glycated hemoglobin used as a surrogate for diabetes control. The report from the 2007 International Dry Eye Workshop (DEWS) summarizes this dilemma stating that even when clinical tests are evaluated for efficacy, the study populations may have been affected by significant bias because there is no widely accepted gold standard for diagnosis.<sup>2</sup> The 2011 American Academy of Ophthalmology (AAO) Preferred Practice Patterns (PPP) publication on DED states that the epidemiological evidence is limited by the lack of uniformity in the definition of dry eye and the inability of any single diagnostic test or set of diagnostic tests to confirm or rule out the condition.<sup>3</sup> Moreover, many of the available tests have low repeatability and do not correlate well with patient-reported symptoms.<sup>1</sup> Alternatively, patient-reported symptoms have been shown to have greater repeatability than objective tests,<sup>4</sup> and clinically, symptoms may be considered the best method for following this condition over time.<sup>1</sup>

Multiple questionnaires, including the Ocular Surface Disease Index (OSDI), McMonnies dry eye index, and the Impact of Dry Eye on Everyday Life (IDEEL), have been developed over time to assess and better stratify DED symptom severity. The OSDI is a 12-item survey that assesses ocular discomfort and effect of DED on daily life over a 1-week period.<sup>5</sup> The McMonnies questionnaire is a 12-item instrument that queries not only symptoms but also risk factors associated with DED, such as thyroid disease and medicamentosa.<sup>6,7</sup> The IDEEL, which has 57 questions, was created as a patient-reported outcome measure for assessing the impact of DED on daily lives of the patients.<sup>8</sup> Although this is certainly not an exhaustive list of symptom questionnaires, in general, the aforementioned questionnaires and others have shown only moderate correlation with clinical signs. Even when an association has been proven, it is usually not possible to predict severity of symptoms based on objective signs and vice versa.<sup>9</sup> With the potential for great variability in clinical practice and the complexity of DED management, this survey was created as a litmus to assess the attitudes, perceptions, and current dry eye practice patterns of eye care providers in North Carolina. The goal of this survey was not to contribute to the development of a standardized set of treatment guidelines, rather, it was meant to generate insight on how eye care providers are treating DED as compared with the recommendations set forth by the 2007 DEWS report and the AAO Dry Eye PPP publication.

## Materials and Methods

An anonymous, 17-question online survey was created using SurveyMonkey, a Web-based survey engine. Survey items were written to assess practitioner knowledge and opinions on

patient symptoms and diagnostic and treatment approaches for patients with DED. Selected examples of questions included

“What are the most common symptoms you hear from dry eye patients?”

“What is your first line treatment for dry eye disease?”

“From your experience, what percent of dry eye patients fail treatment with artificial tears?”

“From your experience, what percent of dry eye patients fail treatment with Restasis?”

“What is the main test you use to guide therapeutic effect?”

“On average, how much time do you spend examining dry eye patients?”

After approval from the University of North Carolina Institutional Review Board, the publicly available membership lists of the North Carolina Ophthalmology and Optometry Associations were accessed to gain contact information. A total of 400 members, including comprehensive ophthalmologists, cornea specialists, and optometrists, were selected from the databases. We searched the Optometry and Ophthalmology Academy directories for practitioners in North Carolina and systematically selected every third optometrist in the optometric directory. Because there were fewer ophthalmologists compared with optometrists in the state, all ophthalmologists listed as comprehensive practitioners or cornea specialists were selected to participate in the study. Each was mailed an introductory letter with a link to the online survey. Descriptive results are presented with no intention to infer to any larger population.

## Results

Of the 400 mailed letters, 107 providers accessed the online survey. One hundred completed the study, yielding a 25% final response rate. Responses to individual questions varied from 95 to 100 providers. The survey results are summarized in Table 1. Because multiple questions were asked in a paired format, where the first item prompted the respondent to select the single best answer and the subsequent question gave the respondent the ability to select multiple answers to a similar stem, we were able to assess concurrence of responses across questions. For the 3 questions asked in this format, 90% to 92% of the respondents included their response to the first question as one of their answers to the second item. This indicates reasonable consistency among the respondents.

More notable results presented in Table 1 are highlighted. Forty-seven percent of survey participants reported tear breakup time (TBUT) as the test they most often used to evaluate DED, with fluorescein stain for corneal epithelial defects closely second at 39%. The most common combination of tests was TBUT, fluorescein stain, and lissamine green stain. Providers reported that the most frequent symptom described by patients with DED was *burning* (46.5%). This was followed by *foreign body sensation* (30.3%) and *tearing* (17.2%). *Itching*, *inability to cry*, and *inability to work* were rarely reported as common symptoms described by dry eye patients. Providers indicated that their first-line therapy for DED was artificial tears (80.8%), with warm compresses/lid scrubs closely second (15.2%).

Providers were also asked to estimate, based on their clinical experience, what percentage of DED patients failed treatment with artificial tears. The most frequent response, selected by 39.4% of respondents, was that 20% to 40% of their patients failed treatment, whereas 34.3% of practitioners reported that 40% to 60% of their patients failed treatment. Consistent with the product literature, 32.6% of respondents indicated that up to 20% of their patients failed cyclosporine ophthalmic emulsion (Restasis 0.05%; Allergan, Inc., Irvine, CA). Interestingly, 68.4% of respondents replied that cyclosporine failed in 20% of their patients or more. When asked which test was used to guide therapeutic effect, 69.7% reported patient history as having the largest impact on their choice of therapies. The most common aggregate tests for judging therapeutic effect were patient history (82.8%), fluorescein stain (80.8%), TBUT (67.7%), and lissamine green stain (31.3%). When asked about the amount of time involved in patient visits, 56.6% of providers reported that they spend 4 to 9 minutes examining patients and 69.4% reported that they spend 4 to 9 minutes talking with patients in the office. Of note, 68.8% of respondents did not consider themselves to be DED specialists. Finally, based on the responses of these providers, rheumatoid arthritis, Sjögren syndrome, anxiety or depression, vision correction surgery, smoking, and thyroid disease were all considered common comorbidities with response rates equal to or greater than 20%.

## Discussion

Although the anonymity of the respondents was preserved, much information can be gained from the answers of the respondents to the survey. Most respondents (68.8%) identified themselves as not being DED specialists. This is consistent with most general or comprehensive eye care providers who are likely to encounter and treat patients with DED. We did not specify a definition of DED specialist; thus, responses to this question were based on the respondent's perception of a specialist. Therefore, the survey gives an informative snapshot of how dry eye is being managed in a broader community context across both optometrists and ophthalmologists. It should be noted that this survey pooled results from comprehensive ophthalmologists, corneal specialists, and optometrists to achieve a more meaningful sample size; we did not ask respondents to identify their type of training. This approach also provides a stronger reflection of the current standard of care among community providers. We justify this approach because previous studies have found minor differences in the tests ophthalmologists and optometrists prefer to diagnose dry eye. We deemed our pooled method acceptable because there is no other evidence to suggest that the three types of providers approach management and treatment of DED differently.

This survey sheds light on the signs and symptoms regularly used by eye care providers to guide their diagnosis and treatment. The DEWS group and the AAO PPP made recommendations for diagnosing dry eye, and this survey provides the opportunity to compare how such recommendations are practiced in the community. Although TBUT and fluorescein stain were the most frequently used clinical tests, 69.7% of respondents relied on patient history as the most common measure of therapeutic effect. Such findings suggest less reliance on any of the objective tests available at present. Our results are corroborated by two previous studies. In another survey study published by Korb<sup>10</sup> in 2000, 68 ophthalmologists and optometrists (34 of each) replied with their top choices for diagnostic

tests. Although patient history was the most common overall first choice by respondents, fluorescein breakup time and history were the most popular for optometrists, whereas ophthalmologists were much more likely to rank Schirmer testing as the most important diagnostic test.<sup>10</sup> In that same year, Nichols et al.<sup>11</sup> published a multisetting record review examining this same topic. They likewise found that history was the most commonly used clinic tool, although optometrists once again preferred staining and TBUT to the Schirmer testing and tear meniscus assessment used by ophthalmologists. Our study, performed over a decade later, shows a preference for TBUT and fluorescein stain. This may indicate that a higher proportion of optometrists responded to our survey; however, we are unable to directly test this hypothesis because we did not separate responses based on provider type. Despite the development of other diagnostics in the past 10 years, none of them have supplanted patient history as the leading test for the diagnosis of DED.

Neither of the earlier studies by Nichols et al.<sup>11</sup> and Korb,<sup>10</sup> published before the release of the DEWS report, had appreciable response rates for tear osmolarity. The 2003 version of the AAO PPP does not discuss tear osmolarity for the diagnosis of DED,<sup>12</sup> but tear osmolarity is mentioned in the 2011 revision of this publication.<sup>3</sup> Although the DEWS group recognized tear osmolarity as a well-validated measure with the potential to become the gold standard for diagnosing DED, the group also cautioned that the technology is not widely in use outside of research settings and academic institutions.<sup>2</sup> Our survey corroborates this, with only 2% of providers reporting tear osmolarity as a frequently used objective test to evaluate dry eye. Because technology for assessing tear osmolarity has only recently become available, the low amount of responses for this test suggests that many providers have not yet adopted this modality for in-office diagnosis. The alternative DEWS recommendation for first-line diagnosis is TBUT, which, in our survey, was shown to be the most commonly used test.<sup>2</sup>

According to our survey, providers selected burning and foreign body sensation among the available choices as the symptoms they most often hear from patients with dry eye. As noted earlier, patient symptom questionnaires, such as the OSDI, are now frequently used, at least in a research context, as standardized measures of patient-reported symptoms. Interestingly, the most common symptom reported by respondents was eye burning, but this symptom is not included in the OSDI, nor does this questionnaire specifically ask about the next two most frequently reported symptoms: foreign body sensation (although OSDI does ask about gritty eyes) and tearing.<sup>5</sup> The McMonnies questionnaire does ask about burning and grittiness but not tearing.<sup>6</sup> However, one of the flaws of the available questionnaires is that patients are confined to selecting symptoms from multiple-choice answers, thereby limiting their ability to fully describe their symptoms. There may be a need for a more patient-centered, self-reported measure or questionnaire for clinical practice, which allows patients to report their experience with the symptoms that are most bothersome to them, rather than merely selecting symptoms from a list.

In addition, the currently available medical agents for the treatment of DED, artificial tears and cyclosporine, demonstrated significant failure rates in the experience of our respondents. Although artificial tears were the first-line treatment for 80.8% of the providers, 85.9% of providers identified a failure rate of 20% or more for such agents. Studies have

demonstrated improvement in clinical signs with artificial tears, but at a practice level, providers still reported that large numbers of patients failed with this therapy.<sup>13</sup> Providers were also asked about the cyclosporine failure rate, with “failure” serving as a broad term encompassing both intolerance to the medication and the lack of efficacy in relieving ocular symptoms. In phase-3 clinical trials, 6.5% of the participants randomized to 0.05% cyclosporine prematurely discontinued the drug owing to adverse side effects.<sup>14</sup> A 2008 study by Perry et al.<sup>15</sup> evaluating cyclosporine in mild, moderate, and severe DED reported that 9.4% of 158 patients failed to complete 3 months of treatment because of adverse effects, lack of positive effect, or expense in continuing therapy, with *burning on application* as the most common reason for treatment failure (4.4% of all patients). According to information from the manufacturer of cyclosporine ophthalmic emulsion, the most common adverse event with this drug is burning, which is experienced in 17% of patients.<sup>16</sup> In the phase-3 trials, 31.5% of patients using 0.05% cyclosporine ophthalmic emulsion showed no improvement based on the physicians' global response to treatment assessment,<sup>14</sup> whereas in the study by Perry et al,<sup>15</sup> 22% of patients reported no improvement in symptoms, and 6.67% actually reported worsening of symptoms. In the experience of the providers in this survey, the cyclosporine failure rate was most frequently estimated to be 0% to 20%, indicating that treatment was successful in 80% to 100% of patients. However, it is interesting to note that an aggregate of 68.4% of respondents chose a failure rate of 20% or greater. In addition, 4.2% of respondents indicated that patients failed cyclosporine at least 80% of the time. These responses serve as further confirmation that medical therapies, such as artificial tears and cyclosporine, have significant failure rates, even though they are commonly recommended as therapy for DED. The result exemplifies the need for continued research to develop specific drug targets to treat DED.

The survey also asked providers to indicate which comorbidities they most often see in their dry eye patients. Rheumatoid arthritis, Sjögren syndrome, anxiety or depression, vision correction surgery, smoking, and thyroid disease all received 29% of responses or greater. This was consistent with the Beaver Dam and Blue Mountains Eye studies, and a Taiwanese report, which indicated that all of the aforementioned conditions have a higher prevalence in patients with DED.<sup>17-19</sup> The increased prevalence of anxiety and/or depression among dry eye patients is consistent with the numbers reported in other chronic diseases. Up to 20% of patients with diabetes and coronary heart disease, for example, also reportedly have depression.<sup>20</sup> This underscores the need for more investigation into the relationship between depression and DED and the possibility of using chronic disease management strategies in DED.

The limitations of this study are its moderate response rate and small sample size. In addition, only North Carolina providers were surveyed, limiting generalizability to the broader U.S. population. Furthermore, because this survey was presented in a multiple-choice format, respondents were forced to select one of the available answers and could not provide their own response. This limited the ability to assess individual preferences in diagnosing and managing DED. In several of the survey items, we asked providers to respond to questions about the failure rate of treatments, such as artificial tears and cyclosporine; questioning about the failure rate instead of the success rate may have

introduced a negative bias. Finally, no questions addressed contact lens wear as a contributor to DED.

In conclusion, although multiple studies have evaluated clinical tests and symptoms of dry eye, no gold standard currently exists for unequivocal diagnosis of DED.<sup>3</sup> In our respondents, patient history was widely reported as the most commonly used factor to guide DED management, with TBUT as the most commonly used objective test. Overall, this survey shows that current practice patterns largely reflect the recommendations in the DEWS report and AAO PPP document. However, adoption of tear osmolarity in particular has lagged behind the implementation of some other objective tests, which may be a reflection of financial barrier to using this technology. An alternative explanation may be that providers prefer patients' self-report over tear osmolarity testing. The lack of tear osmolarity adoption requires further study. Given the emphasis on patient history and limitations of currently available symptom questionnaires mentioned above, more work is needed to identify a practical measure of patient-reported symptoms because they relate to the quality of life. Finally, this survey reiterates the urgent need for more effective diagnostic and therapeutic modalities, given the respondents' preference for patient history and the reported high failure rates for both artificial tears and cyclosporine.

## Acknowledgments

J. F. Williamson had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

## References

1. Smith JA, Albeitz J, Begley C, et al. The epidemiology of dry eye disease: Report of the epidemiology subcommittee of the International Dry Eye Workshop (2007). *Ocul Surf.* 2007; 5:93–107. [PubMed: 17508117]
2. Bron AJ, Abelson MB, Ousler G, et al. Methodologies to diagnose and monitor dry eye disease: Report of the diagnostic methodology subcommittee of the International Dry Eye Workshop (2007). *Ocul Surf.* 2007; 5:108–152. [PubMed: 17508118]
3. Feder, RS., editor. Dry Eye Syndrome— Limited Revision. San Francisco, CA: America Academy of Ophthalmology; 2011. American Academy of Ophthalmology Cornea/External Disease Panel. Preferred practice pattern guidelines. Available at: [www.aaopt.org/ppp](http://www.aaopt.org/ppp) [Accessed April 10, 2012]
4. Nichols KK, Mitchell GL, Zadnik K. The repeatability of clinical measurements of dry eye. *Cornea.* 2004; 23:272–285. [PubMed: 15084861]
5. Ozcura F, Aydin S, Helvacı MR. Ocular Surface Disease Index for the diagnosis of dry eye syndrome. *Ocul Immunol Inflamm.* 2007; 15:389–393. [PubMed: 17972223]
6. McMonnies CW. Key questions in a dry eye history. *J Am Optom Assoc.* 1986; 57:512–517. [PubMed: 3489027]
7. Nichols KK, Nichols JJ, Mitchell GL. The reliability and validity of McMonnies Dry Eye Index. *Cornea.* 2004; 23:365–371. [PubMed: 15097131]
8. Abetz L, Rajagopalan K, Mertzanis P, et al. Development and validation of the impact of dry eye on everyday life (IDEEL) questionnaire, a patient-reported outcomes (PRO) measure for the assessment of the burden of dry eye on patients. *Health Qual Life Outcomes.* 2011; 9:111. [PubMed: 22152125]
9. Johnson ME. The association between symptoms of discomfort and signs in dry eye. *Ocul Surf.* 2009; 7:199–211. [PubMed: 19948103]
10. Korb DR. Survey of preferred tests for diagnosis of the tear film and dry eye. *Cornea.* 2000; 19:483–486. [PubMed: 10928763]

11. Nichols KK, Nichols JJ, Zadnik K. Frequency of dry eye diagnostic test procedures used in various modes of ophthalmic practice. *Cornea*. 2000; 19:477–482. [PubMed: 10928762]
12. Matoba, AY., editor. *Dry Eye Syndrome— Limited Revision*. San Francisco, CA: American Academy of Ophthalmology; 2003. American Academy of Ophthalmology Cornea/External Disease Panel. Preferred practice pattern guidelines. Available at: [www.aaopt.org/ppp](http://www.aaopt.org/ppp) [Accessed April 10, 2012]
13. Doughty MJ, Glavin S. Efficacy of different dry eye treatments with artificial tears or ocular lubricants: A systematic review. *Ophthalmic Physiol Opt*. 2009; 29:573–583. [PubMed: 19686307]
14. Sall K, Stevenson OD, Mundorf TK, et al. Two multicenter, randomized studies of the efficacy and safety of cyclosporine ophthalmic emulsion in moderate to severe dry eye disease. *Ophthalmology*. 2000; 107:631–639. [PubMed: 10768324]
15. Perry HD, Solomon R, Donnenfield ED, et al. Evaluation of topical cyclosporine for the treatment of dry eye disease. *Arch Ophthalmol*. 2008; 126:1046–1050. [PubMed: 18695097]
16. Allergan. [Accessed September 20, 2013] Restasis Prescribing Information. 2013. Available at: [http://www.allergan.com/assets/pdf/restasis\\_pi.pdf](http://www.allergan.com/assets/pdf/restasis_pi.pdf)
17. Wang TJ, Wang IJ, Hu CC, et al. Comorbidities of dry eye disease: A nationwide population-based study. *Acta Ophthalmol*. 2012; 90:663–668. [PubMed: 20809911]
18. Chia EM, Mitchell P, Rochtchina E, et al. Prevalence and associations of dry eye syndrome in an older population: The Blue Mountains Eye Study. *Clin Experiment Ophthalmol*. 2003; 31:229–232. [PubMed: 12786773]
19. Moss SE, Klein R, Klein BE. Prevalence of and risk factors for dry eye syndrome. *Arch Ophthalmol*. 2000; 118:1264–1268. [PubMed: 10980773]
20. Katon W, Lin E, Von Korff M, et al. Integrating depression and chronic disease care among patients with diabetes and/or coronary heart disease: The design of the TEAMcare study. *Contemp Clin Trials*. 2010; 31:312–322. [PubMed: 20350619]



**Table 1**  
**Results of Dry Eye Disease Survey Completed by Ophthalmologists and Optometrists**

Question Number	Question	Respondents, n (%)
1	What is your most often used test to evaluate dry eye disease?	100
	Schirmer test with anesthetic	3 (3.0)
	Schirmer test without anesthetic	2 (2.0)
	Tear breakup time	47 (47.0)
	Tear osmolarity	2 (2.0)
	Fluorescein stain	39 (39.0)
	Lissamine green stain	7 (7.0)
2	Which of the following tests do you most often use to evaluate dry eye disease? <sup>a</sup>	100
	Schirmer test with anesthetic	25 (25.0)
	Schirmer test without anesthetic	11 (11.0)
	Tear breakup time	83 (83.0)
	Tear osmolarity	4 (4.0)
	Fluorescein stain	77 (77.0)
	Lissamine green stain	28 (28.0)
3	What is the most common symptom you hear from dry eye disease patients?	99
	Burning	46 (46.5)
	Itching	4 (4.0)
	Foreign body sensation	30 (30.3)
	Tearing	17 (17.2)
	Inability to cry	1 (1.0)
	Inability to work	1 (1.0)
4	What are the most common symptoms you hear from dry eye patients? <sup>a</sup>	99
	Burning	85 (85.9)
	Itching	30 (30.3)
	Foreign body sensation	74 (74.7)
	Tearing	77 (77.8)
	Inability to cry	4 (4.0)
	Inability to work	9 (9.1)
5	What is your first-line treatment of dry eye disease?	99
	Artificial tears	80 (80.8)
	Restasis	1 (1.0)
	Fish oil supplements	3 (3.0)
	Punctal occlusion	0 (0)
	Warm compresses and lid scrubs	15 (15.2)
6	From your experience, what percent of dry eye disease patients fail treatment with artificial tears?	99
	Up to 20%	14 (14.1)
	20%–40%	39 (39.4)
	40%–60%	34 (34.3)
	60%–80%	10 (10.1)

Question Number	Question	Respondents, n (%)
	80%–100%	2 (2.0)
7	From your experience, what percentage of dry eye disease patients fail treatment with cyclosporine A (Restasis)?	95
	Up to 20%	31 (32.6)
	20%–40%	24 (25.3)
	40%–60%	27 (28.4)
	60%–80%	9 (9.5)
	80%–100%	4 (4.2)
8	What is the main test you use to guide therapeutic effect?	99
	Patient history	69 (69.7)
	Schirmer test	2 (2.0)
	Fluorescein stain	12 (12.1)
	Lissamine green stain	6 (6.1)
	Tear breakup time	9 (9.1)
	Tear osmolarity	1 (1.0)
9	Which of the following tests do you use to guide therapeutic effect? <sup>a</sup>	99
	Patient history	82 (82.8)
	Schirmer test	19 (19.2)
	Fluorescein stain	80 (80.8)
	Lissamine green stain	31 (31.3)
	Tear breakup time	67 (67.7)
	Tear osmolarity	5 (5.1)
10	On average, how much time do you spend examining dry eye patients?	99
	1–3 min	13 (13.1)
	4–6 min	35 (35.4)
	7–9 min	21 (21.2)
	10–12 min	16 (16.2)
	13–15 min	6 (6.1)
	. 15 min	8 (8.1)
11	On average, how much time do you spend talking with your patients?	98
	4–6 min	33 (33.7)
	7–9 min	35 (35.7)
	10–12 min	20 (20.4)
	13–15 min	4 (4.1)
	. 15 min	6 (6.1)
12	Are you a specialist in the management of dry eye disease?	96
	Yes	30 (31.3)
	No	66 (68.8)
13	Is there one artificial tear you prefer?	97
	Yes	51 (52.6)
	No	46 (47.4)
14	What are the most common comorbid conditions of your dry eye patients? <sup>a</sup>	99

Question Number	Question	Respondents, n (%)
	Rheumatoid arthritis	60 (60.6)
	Sjögren syndrome	49 (49.5)
	Gout	6 (6.1)
	Anxiety or depression	30 (30.3)
	Vision correction surgery	39 (39.4)
	Smoking	41 (41.4)
	Thyroid disease	29 (29.3)
	None of the above	21 (21.2)
15	How long have you been practicing?	99
	< 5 y	12 (12.1)
	5–10 y	12 (12.1)
	10–20 y	21 (21.2)
	20–30 y	31 (31.3)
	30–40 y	17 (17.2)
	> 40 y	12 (12.1)
16	What is your gender?	98
	Female	26 (26.5)
	Male	72 (73.5)

<sup>a</sup> Respondents were permitted to select more than one answer on these items, so the percentages may not add to 100%.