Survey of optometrists in nine therapeutic states regarding their treatment of five different ocular conditions

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Survey of optometrists in nine therapeutic states regarding their treatment of five different ocular conditions

Abstract
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Degree Type
Thesis

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SURVEY OF OPTOMETRISTS IN NINE THERAPEUTIC STATES REGARDING THEIR TREATMENT OF FIVE DIFFERENT OCULAR CONDITIONS

BY

TROY M. AVERY
MARK F. GOTCHER
EDWARD W. LAULAINEN

A thesis submitted to the faculty of the College of Optometry Pacific University Forest Grove, Oregon for the degree of Doctor of Optometry May, 1995

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Biography of Authors:

Troy Avery received his Bachelor of Science degree with a major in Biology from Pacific University in 1992. He then went on to obtain the degree of Doctor of Optometry from Pacific University in 1995. Awards include a Challenge Award Academic Scholarship from Pacific in 1991, and also was a member of the Dean's List. Future plans include joining a private optometric practice in the northwestern U.S.

Mark Gotcher received his Bachelor of Science degree with a major in Visual Science from Pacific University in 1993. A Doctor of Optometry degree was awarded May 1995. Prior to attending Pacific University he acquired many of his Optometry prerequisites at the University of Arizona. During the course of his optometric studies he received The Dean's Award and was elected to "Whos Who" in America's Schools and Colleges for leadership and involvement in student programs. Future plans include returning to his home state of Arizona where he wishes to practice and become involved in community and optometric programs.

Ed Laulainen received his Bachelor of Science from Pacific University in 1991. He graduated from Pacific University College of Optometry in 1995, where he was an outstanding clinician. Ed was a member of AOSA, AOA-PAC, Contact Lens Section and Sports Vision Section of the AOA, and Phi Theta Upsilon Optometric Fraternity. Ed returned to his hometown of Kelso, WA where he lives and works in private practice, enjoys spending time with his family, community involvement, and outdoor recreation.
ABSTRACT

This survey includes practicing optometrists from nine therapeutic states, to which a total of 225 surveys were sent, requesting their treatment of five different ocular conditions. The purpose of the survey was to see if practicing optometrists use the same "treatment of choice" that are taught in optometry school.

The data was compiled into primary drugs of choice, and the total number of times a drug was listed for a given condition. The five conditions used were: bacterial conjunctivitis, allergic conjunctivitis, epithelial corneal abrasion, anterior uveitis, and viral conjunctivitis. Corresponding drugs of choice were: Polytrim, Naphcon-A, Tobrex, Pred Forte with a cycloplegic, and Naphcon-A. Data is displayed in graphical and tabular form for ease of interpretation.
INTRODUCTION

There are currently 42 states in the United States where optometrists may be licensed to prescribe therapeutic agents to treat ocular conditions. Although the laws may differ from state to state, all optometry students are educated in the treatment of a vast array of ocular conditions.

For most common ocular conditions, there exists a number of acceptable treatments. When diagnosing, it is helpful to learn about certain signs and symptoms, which help identify particular conditions; likewise, remembering a specific "treatment of choice" makes it easier to recall which therapeutic agent may be most useful for a given condition. There are usually many different therapeutic agents that could be used, although many physicians habitually rely on one in particular.

The purpose of this study was to survey a number of practicing optometrists to see if a consensus exists as to what the drug of choice is for five different ocular conditions. In optometry school, there is little debate over what the proper treatment is for a given condition. When faced with learning volumes of material, it helps to remember one particular treatment that the majority of physicians would agree upon as acceptable. However, once in practice, it might not always be feasible to rely upon one particular agent. Laws differ from state to state and there is no guarantee that a given pharmaceutical will be included in the drug formulary approved for use by optometrists. It could also be the case that the preferred treatment taught in school is a relatively new one and the cost of that particular preparation is rather expensive; an optometrist might need to consider the patient's ability to pay when writing out the prescription. As many physicians can testify, it is not unusual for a patient to take a prescription to a pharmacy and choose not to have it filled when confronted with the cost. For that reason, it may be better to choose an agent that has been available longer and is less expensive; even if it may not be considered the treatment of choice for a given condition, it may still be an effective choice.

A survey of practicing optometrists may provide insight into alternative methods of treating common ocular conditions. Due to the numerous pharmaceutical agents approved for optometric use, it could be helpful to determine if a clear favorite exists for a given condition. This could be especially useful for those new graduates who may not feel so confident when faced with writing those first few prescriptions.
METHODS

The survey consisted of a cover page explaining the nature of the study with the reverse side containing the questionnaire. The survey was mailed to 225 practicing optometrists in nine different states. Included with the survey was a stamped, self-addressed envelope to promote completion of the survey. The optometrists were selected from the 1993 Blue Book of Optometry, from Florida, Indiana, Kansas, Kentucky, Maine, Nebraska, Ohio, Oregon, and Washington; states were chosen to represent a wide range of therapeutic privileges. Efforts were made to keep the survey questions neutral in tone. A copy of the survey instrument may be seen in Appendix A.

The initial question directed the doctors to indicate their therapeutic certification status. The second question listed five common ocular conditions: bacterial conjunctivitis, allergic conjunctivitis, corneal epithelial abrasion, anterior uveitis, and viral conjunctivitis. These fairly common conditions can be treated by optometrists in the majority of the states that allow therapeutic privileges. The doctors were asked to list any or all of the therapeutic agents that they would use to treat the ocular conditions. If a given condition would be referred, the doctor was instructed to write in "NT" indicating that he or she would not treat this particular condition.

A period of two months was allowed to pass to ensure that all completed surveys had been received. Statistical analysis was then performed. Certification status of respondents was calculated on a percentage basis. When analyzing particular conditions, if more than one therapeutic agent was listed, the first one written in was considered to be the primary treatment. The additional drugs listed were tallied and compared on the basis of what percentage of surveys that the agent was cited. The "drug of choice" was determined to be the one that was chosen most frequently as primary treatment. Analysis of the treatment of anterior uveitis was more difficult, as many doctors chose to use a combination of drugs in their treatment regimen. In this instance, totals and percentages for each method of treatment was calculated.

RESULTS

The number of surveys completed was 135 yielding a return rate of 60%. Of the original 225 surveys mailed, 25 were not delivered because addresses were no longer current, leaving the adjusted return rate at 67.5%.
With respect to licensure status, 125 or 92.6% of the doctors surveyed had current therapeutic privileges in their state. Only three surveys, or 2.2%, were from optometrists who were currently seeking TPA certification. Seven optometrists responded that they were not TPA certified, nor did they have intention to become certified, which is 5.2% of the total. (See Graph 1)

For each ocular condition listed in the survey, the percentages of optometrists who choose to treat the condition are included. The therapeutic agents are listed by percentage of optometrists who would make it their primary drug of choice, as well as the percentage of the total number of times the agent was listed for the specific condition.

The names of the therapeutic agents contained herein, are in brand or trade name form (see Appendix B for a complete listing of all the drugs mentioned, with generic names and percentage concentration.)

**Bacterial conjunctivitis (non-specific)** was the first condition listed on the survey. All 125 optometrists with TPA certification chose to treat it. With regards to primary drug of choice, Polytrim was rated number one. 30.3% of optometrists indicated this agent as their first line of defense. Tobrex and Gentamicin were second and third running at 29.5% and 23.7%, respectively. These three agents were clearly the first choice for most optometrists, accounting for a total of 83.5% of all responses. Ciloxan claimed 5.0%, while Ocuflox, Polysporin ointment and Sodium Sulfacetamide each received 2.5%. Erythromycin and Neosporin ointments were next, both at 1.6%, and Blephamide at 0.8% rounds out the primary diagnosis. A graphical view of the primary drugs of choice are listed in Graph 2. The total number of times a drug was mentioned, (or total percentages) are listed in Table 1. Tobrex was the drug most often mentioned, followed by Gentamicin, Polytrim, and Ciloxan.

**Allergic conjunctivitis** was treated by all 125 optometrists with TPA certification. Naphcon-A was the clear choice for the primary treatment with 38.1%, followed by Acular and Alomide with 19.0% and 11.9%, respectively. Vasocon-A was next with 5.8%, while Flarex and artificial tears both had 4.8% of respondents. Livostin was next at 4.0%, cold compresses along with Albalon-A followed at 3.7%, leaving Pred Mild with 2.4% and Blephamide at 1.8%. A summary of the primary diagnoses are listed in Graph 3. As for total percentages, Naphcon-A and Acular were named on almost half of all surveys. (See Table 2 for a breakdown of total allergic conjunctivitis responses.)

The next condition was **epithelial corneal abrasion**, and again, all 125 optometrists with TPA certification chose to treat this. Besides therapeutic agents listed by name, included are categories with anti-infectives (non-specific) in conjunction with a
pressure patch, cycloplegic, steroid, and patch with cycloplegic, based on the responses that were given. The number one primary treatment was an anti-infective in combination with a patch at 19.8%, followed closely by Tobrex solution at 19.0%. Gentamicin was next at 15.7%, and the combination of an anti-infective with cycloplegic ranked fourth at 10.7%. Polysporin ointment had 9.9%, Polytrim 8.3%, followed by an anti-infective-pressure patch/cycloplegic combination of 7.5%. An anti-infective in conjunction with a steroid comes next at 3.3%, while Ciloxan and Tobrex ointment both received 2.5%. Voltaren completes the responses with 0.8%. (See Graph 4 for a summary.) Total percentages were in correlation with the primary diagnosis. (Table 3.)

The next condition provided for the optometrists was anterior uveitis. In this case, five O.D.s of the 125 TPA certified chose not to treat. The leading treatment of anterior uveitis was a steroid in combination with a cycloplegic agent (non-specific), at 58.3%. Pred Forte was chosen by 26.1%, while cycloplegic alone accounted for 6.1%. FML Forte was used by 5.2%, while Flarex and Tobradex each were used by 7.1% of the doctors responding. Tobrex alone resulted in the final 0.9% of the data. (A summary of the data is shown in Table 4.)

Viral conjunctivitis was the last condition given to the optometrists, and all 125 with TPA certification responded. However, 11.2% of the optometrists indicated that no treatment was necessary, with the exception of patient education. With this in mind, 34.6% said that ocular lubricants would be their primary treatment, and 7.5% said cold compresses should be utilized. This totals 53.3% of optometrists who chose to not use therapeutic agents as a primary treatment of viral conjunctivitis. The remaining percentages of those who would treat with therapeutics breaks down as follows; Naphcon-A 13.1%, Gentamicin 3.7%, Blephamide 2.8%, Maxitrol 2.8%, Polytrim 2.8%, Vasocon-A 2.8%, FML 1.9%, Tobrex 1.9%, Tobradex 1.9%. The diagnosis did not specify whether the conjunctivitis had any herpetic involvement, and because of this, 12.2% of the responses were aimed toward herpes simplex virus. Of those, Viroptic was chosen by 7.5% and Vira-A was used by 4.7% for primary treatment. (A summary of findings is shown in Graph 5.)

DISCUSSION

The return rate of 67.5% was much higher than anticipated. When the survey was prepared, a 25% rate of return was expected. It might be concluded that the positive result was due to the widespread expansion of therapeutic privileges of optometrists in this country, and the corresponding change in the nature of how
optometry is practiced. Nearly all the surveys returned were completed by TPA certified optometrists. Of those 135 surveys, 92.6% were from optometrists with therapeutic licenses, adding validity to the study. As expected, certified optometrists would be more likely to complete the survey, accounting for the high percentage.

The results for treatment of bacterial conjunctivitis showed Polytrim as the antibiotic of choice followed closely by Tobrex and Gentamicin. When treating bacterial conjunctivitis, it is common practice to prescribe an antibiotic without first culturing to determine the causative microbe. Because the invading organism is unknown, a broad-spectrum antibiotic is advisable.

When doctors were asked what their would be treatment for bacterial conjunctivitis, it was not specified whether or not the presentation was acute, hyper acute or chronic in nature. When not given that valuable information, one would expect many to use the "shotgun" approach and use a proven broad-spectrum antibiotic.

Tobrex and Gentamicin are old standards in that they are both effective, broad-spectrum antibiotics that have been in use for many years. As with all antibiotics, the longer a particular agent has been in use, the greater the likelihood of developing resistant organisms. Hence, Polytrim is rapidly becoming the drug of choice in treatment of bacterial conjunctivitis.

Even though Polytrim was cited most frequently as primary treatment, after numbers were tallied, (regardless of order, either primary, secondary or tertiary), Tobrex was listed more times (54.1% of all surveys). Gentamicin was second having been cited on 46.7% of all surveys, with Polytrim third at 43.0%. The only other antibiotic that had significant mention was Ciloxan, which appeared in 23.0% of all surveys. Ciloxan is indicated primarily for treatment of corneal ulcers and is only indicated in the treatment of conjunctivitis that is a result of a staphylococcal infection.1

When looking at the overall data relating to bacterial conjunctivitis, we could see that Tobrex and Gentamicin remain very popular antibiotics, even with the advent of Polytrim. Given that Polytrim has only been on the market for a very short time, it is certainly gaining favor rather quickly. The two older drugs are available in both solution and ointment form, while Polytrim is currently only in solution. Also, as with any new drug, Polytrim is relatively expensive compared to the others. It is likely that it will continue to grow in its usage as acceptance of the drug becomes more widespread.

When asked how they would treat allergic conjunctivitis, doctors chose Naphcon-A as their drug of choice. Naphcon-A is a combination drug consisting of an antihistamine and a decongestant in solution. It was chosen as primary treatment in 38.1% of all optometrists surveyed. Acular was second, being cited in 19.0% of all
surveys. Acular is a non-steroidal anti-inflammatory agent and is indicated for the relief of ocular itching due to seasonal allergic conjunctivitis. Alomide came in third at 11.9%. Alomide is a mast-cell stabilizer indicated in treatment of vernal conjunctivitis, vernal keratoconjunctivitis, and vernal keratitis. There were seven other drugs listed as a primary treatment for allergic conjunctivitis, none of which exceeded 6% of the sample.

In the statistics for the total number of times a drug was cited, regardless of order, Naphcon-A was still the most popular at 49.6% of all surveyed. Acular and Alomide were much closer this time showing up on 47.4% and 35.6% of all surveys respectively. A conclusion that could be drawn is that these drugs are strongly considered as treatment but tend to be a second or third choice. A steroid, FML Acetate 0.1%, was cited in 17.0% of all surveys.

As with Tobrex and Gentamicin earlier, Naphcon-A is a proven drug having been in use for many years, and is relatively inexpensive. Acular and Alomide are both very new, less proven and more expensive. Using Alomide to treat allergic conjunctivitis is actually an off-label use.

Since there was no indication as to the severity of the allergic conjunctivitis in question, it is not surprising that a variety of responses was received. A total of 8.5% of those surveyed would simply provide therapy consisting of cold compresses or artificial tears.

When we surveyed doctors as to how they would treat an epithelial corneal abrasion, we received many different responses. Even though we did not ask for particular details as to the nature of the treatment plan (e.g., combination of drugs, patching), some doctors volunteered a detailed treatment regimen and others did not.

In regards to the particular antibiotics that were chosen, Tobrex was the most often cited, being listed in 21.5% of all surveys as the primary antibiotic used. Gentamicin was second at 15.7%, and surprisingly, Polytrim was a distant fourth at 8.3% trailing Polysporin at 9.9%. Once again, the established drugs were still very popular and were used more than the newer ones.

When we compared the total number of times each drug appeared on a survey, the order remained the same except Ciloxan became the fourth most frequently cited which replaced Polytrim. This may not be surprising to some as Ciloxan is very effective in the treatment of bacterial corneal ulcers. As a result, it could be deemed an effective prophylactic against development of a corneal ulcer from an abrasion.

Of those surveyed, 20.7% stated they would treat the corneal abrasion with a combination of antibiotic and patching. Another 12.6% would use an antibiotic in
combination with a cycloplegic (likely in case of secondary uveitis). A smaller number, 8.1%, chose to employ all three. Finally, 5.2% chose a steroid/antibiotic combination.

Overall, 69% of doctors surveyed chose to employ an antibiotic for prophylaxis in their primary treatment of an epithelial corneal abrasion. Every doctor that completed the survey chose some form of pharmacological treatment when given the diagnosis of an epithelial corneal abrasion.

When asked treatment for anterior uveitis, once again a variety of responses was received. An important point is that not all certified optometrists were permitted to treat anterior uveitis as part of their therapeutic privileges. (As our survey was anonymous, we did not track which states our responses came from.) Of the 125 surveys completed by TPA certified optometrists, only 5 doctors said they would choose to refer the anterior uveitis for treatment. There is no guarantee that those 120 doctors who chose to treat the uveitis are actually permitted by state laws to treat the condition.

The majority of those surveyed chose to treat the uveitis primarily with a combination of a steroid and cycloplegic. This accounted for 57.6% of all surveyed. Several doctors, 5.6%, chose to treat with a cycloplegic alone. Two doctors or 1.6% of all surveyed, chose to use an antibiotic/steroid combination, namely Tobradex.

A large percentage of those surveyed, 30.6%, chose to treat the anterior uveitis with a steroid alone. Of that group, 78.9% chose to use Pred Forte as their steroid of choice. FML Forte was second most popular chosen by 15.8%. FML Acetate 0.1% was third at 5.3%.

Even though Pred Forte and FML Forte have been found to be virtually identical in their effectiveness in treating ocular inflammation, Pred Forte is much more popular among doctors surveyed.

It is rather surprising that when the standard of care for treating anterior uveitis calls for the use of a steroid in combination with a cycloplegic, a full 38.4% of doctors chose alternative treatments.5 Once again, one might argue that the survey did not provide enough information regarding signs, symptoms or severity of the condition to be treated. One irrefutable point is that Pred Forte is the steroid of choice when treating anterior uveitis.

When doctors were asked how they would treat viral conjunctivitis, no clear consensus resulted as to the primary drug of choice. Fourteen of the 125 surveyed (11.2%) chose to merely educate the patient and not employ a therapeutic agent. Another 34.6% chose to prescribe only artificial tears and 7.5% chose cold compresses. When we combine these three responses, 53.3% of those surveyed chose not to use a pharmacological agent to treat viral conjunctivitis.
Typically, treatment of viral conjunctivitis is unsatisfactory and the condition usually resolves within two weeks even if left completely untreated. Topical steroids are contraindicated unless ocular inflammation is severe and the possibility of a herpes simplex infection has been excluded. Given that, it is surprising that 10.2% of those surveyed chose to treat the viral conjunctivitis with either a steroid alone or in combination with an antibiotic. One would expect doctors not knowing the causative agent to choose the conservative approach and avoid use of a steroid altogether.

Another odd finding is that 8.4% of all surveyed chose to treat the viral conjunctivitis with an antibiotic. Perhaps they would use an antibiotic because they wanted to ensure that the etiology of the conjunctivitis was actually viral and not of a bacterial nature. However, in the case of our survey, the doctors were provided the diagnosis which leaves one puzzled as to the choice of an antibiotic in this instance.

Many doctors (13.1%), chose to use Naphcon-A to treat the viral conjunctivitis. Normally, one would not think a drug indicated for treatment of allergic conjunctivitis would apply in the treatment of viral conjunctivitis. However, Naphcon-A is described as being "possibly" effective in relieving ocular inflammation and irritation of which both may be present in a viral conjunctivitis.

Two antiviral agents were cited as well. Viroptic was the most popular of the two, being chosen by 7.5% of doctors. Vira-A was cited in 4.7% of all surveys. Both agents are indicated in the treatment of ocular herpes simplex infections involving the cornea, and only the conjunctiva if the cornea is involved as well. Since we did not provide any additional information as to the nature of the conjunctivitis, some doctors may have assumed corneal involvement to be present. It is more likely that the doctors chose an off-label use of these two drugs to treat the conjunctivitis in the event that it may be due to a herpes-simplex virus.

Conclusions

The treatment of ocular disease with therapeutic agents is becoming an important aspect of the modern practice of optometry. This assumption is supported by the large percentage of doctors who took the time to complete the survey. The overall response rate was much higher than was expected.

No shocking data was collected with regard to the particular drugs chosen in treatment of the ocular conditions. A recurring theme was that older drugs remain very popular and remain in widespread use. Also, newer agents are quickly becoming accepted as alternatives to the established ones. This survey was conducted with the thought that
it may be helpful to newly licensed O.D.s and others who may be interested in clinical therapeutic regimens employed by a broad base of practitioners.
Graph 1

CERTIFICATION STATUS

- 5% TPA CERTIFIED
- 93% PURSUING CERTIFICATION
- 2% NON-CERTIFIED

93%
Graph 2. Primary Treatment of Bacterial Conjunctivitis
Graph 3: Primary Treatment of Allergic Conjunctivitis
Graph 4. Primary Treatment of Epithelial Corneal Abrasion

- CILOXAN
- GENTAMICIN
- POLYSPORIN
- POLYTRIM
- TOBREX
- TOBREX (UNG)
- VOLTAREN
- ANTI-INFECTIVE/PATCH
- ANTI-INFECTIVE/CYCLOPLEGIC
- ANTI-INFECTIVE/STEROID
- ANTI-INFECTIVE/PATCH/CYCLO.
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Appendix A

Therapeutic Survey

1. Certification Status:
- please indicate your current status of therapeutic licensure by checking the appropriate box:

[ ] currently licensed for therapeutics
[ ] currently pursuing therapeutic licensure
[ ] not licensed for therapeutic and not pursuing licensure

2. Survey
- five ocular conditions have been diagnosed; please list any or all therapeutic agents you would use in your practice to treat each one, in the space provided. If your state permits treatment of the condition by optometrists, but you would choose not to treat it, please write "NT" in the space instead.

A. Bacterial conjunctivitis (not cultured): ________________________________
[ ] state law does not allow therapeutic treatment of this condition

B. Allergic conjunctivitis: ________________________________
[ ] state law does not allow therapeutic treatment of this condition

C. Epithelial corneal abrasion: ________________________________
[ ] state law does not allow therapeutic treatment of this condition

D. Anterior uveitis: ________________________________
[ ] state law does not allow therapeutic treatment of this condition

E. Viral conjunctivitis: ________________________________
[ ] state law does not allow therapeutic treatment of this condition
Appendix B

Brand Name, Generic Name, Form of Drug, Manufacturer

Acular, ketorolac tromethamine 0.5%, solution, Allergan
Albalon-A, naphazoline hydrochloride 0.05% and antazoline phosphate 0.5%, solution, Allergan
Alomide, lodoxamide tromethamine 0.1%, solution, Alcon
Bacitracin, bacitracin 500 units/g, ointment, various manufacturers
Blephamide, sulfacetamide 10% with prednisolone acetate 0.2%, suspension and ointment, Allergan
Ciloxan, ciprofloxacin hydrochloride 0.3%, solution, Alcon
Dexamethasone, dexamethasone sodium phosphate 0.1%-0.05%, solution and ointment, various manufacturers
Erythromycin, erythromycin 0.5%, ointment, various manufacturers
Flarex, fluoromethalone acetate 0.1%, suspension, Alcon
FML Forte, fluoromethalone acetate 0.25%, suspension, Allergan
Garamycin, gentamicin 0.3%, solution and ointment, various manufacturers
Livostin, levocabastine hydrochloride 0.05%, solution, Ciba Ophthalmics
Maxitrol, polymyxin B 10,000 units with bacitracin 400 units/g and neomycin 3.5 mg/g, suspension and ointment, Alcon
Naphcon-A, naphazoline hydrochloride 0.025% and pheniramine maleate 0.3%, solution, Alcon
Neosporin, polymixin B 10,000 units with bacitracin 400 units/g and neomycin 3.5 mg/g, ointment, Burroughs Wellcome
Ocufllox, ofloxacin 0.3%, solution, Allergan
Polysporin, polymixin B and bacitracin, ointment, various manufacturers
Polytrim, trimethoprim sulfate 0.1% and polymixin B sulfate 10,000 units/mL, solution, Allergan
Pred Forte, prednisolone acetate 1.0%, suspension, Allergan
Pred Mild, prednisolone acetate 0.12%, suspension, Allergan
Sulfacetamide, sodium sulfacetamide 10%, solution and ointment, various manufacturers
TobraDex, tobramycin 0.3% with dexamethasone 0.1%-0.3%, suspension and ointment, Alcon
Tobrex, tobramycin 0.3%, solution and ointment, Alcon
Vasocon-A, naphazoline 0.055 and antazoline 0.5%, solution, Iolab
Vira-A, vidarabine 3.0%, solution, Parke Davis
Viroptic, trifluridine 1.0%, solution, Burroughs Wellcome
Voltaren, diclofenac 0.1%, solution, Ciba Ophthalmics
REFERENCES


Grading Form

Thesis Title: Survey Of Optometrists In Nine Therapeutic States Regarding Their Treatment Of Five Ocular Conditions

Authors: Grade

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