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Chronology of volunteer vision care in Baja California Sur

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Chronology of volunteer vision care in Baja California Sur

Abstract
In June 1986 volunteer vision care services were provided to a Mexican population in Mulege, Baja California Sur and the surrounding area. These services were performed by students from Pacific University College of Optometry’s Amigos Organization. The students spent three weeks in Mulege seeing patients with the intent of improving their optometric skills and experiencing another culture. A total of 237 patients were seen and 153 spectacles were distributed. The refractive status of the population was examined and found to be mainly emmetropic or hyperopic. The apparent pathological status of the patients was evaluated and most common were pterygium, pinguecula, cataracts, arcus senilis, and conjunctival melanosis. This is believed to be in part due to the climate of the area. The trip was a valuable learning experience for the students and provided many ideas for future care possibilities.

Degree Type
Thesis

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CHRONOLOGY OF
VOLUNTEER VISION CARE
IN BAJA CALIFORNIA SUR

BY:
MARK K. HELGESON
LAURIE F. NICHOLSON
TRACY C. WELLS

A thesis submitted to the faculty of the
College of Optometry
Pacific University
Forest Grove, Oregon
for the degree of
Doctor of Optometry
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Adviser:
Dr. Harold M. Haynes
BIOPGRAPHICAL SKETCH OF AUTHORS

Mark K. Helgeson was born in Jamestown, North Dakota. He graduated from high school in 1979 and attended Moorhead State University and the University of Massachusetts in Amherst. With honors, he received a BA in Economics from Moorhead State. Mark was nominated to the Outstanding Young Men in America in 1987. He was active in PTU and Amigos during his time at Pacific University. After optometry school, Mark will be doing a one year residency at the Veterans Administration Medical Center in American Lake, Tacoma, Washington. He plans to practice Optometry in a private setting in the future.

Laurie F. Nicholson was born in Riverton, Wyoming and graduated from high school in 1980. She attended Casper College and the University of Wyoming. She received a BS in Zoology and was honored as the Outstanding Pre-Optometry Student in Wyoming. In optometry school, Laurie was involved in ASPU, SOA, PTU, and Amigos. She was nominated to Outstanding Young Women of America in 1986. In the future Laurie plans to practice private Optometry with an emphasis in Pediatrics.

Tracy C. Wells was born in Decorah, Iowa. She graduated from high school in 1980 and attended Luther College. She received a BA in biology. In optometry school, Tracy participated in Amigos and SOA. She plans to practice Optometry in a private setting in the future.
ABSTRACT

In June 1986 volunteer vision care services were provided to a Mexican population in Mulege, Baja California Sur and the surrounding area. These services were performed by students from Pacific University College of Optometry's Amigos Organization. The students spent three weeks in Mulege seeing patients with the intent of improving their optometric skills and experiencing another culture. A total of 237 patients were seen and 153 spectacles were distributed. The refractive status of the population was examined and found to be mainly emmetropic or hyperopic. The apparent pathological status of the patients was evaluated and most common were pterygium, pinguecula, cataracts, arcus senilis, and conjunctival melanosis. This is believed to be in part due to the climate of the area. The trip was a valuable learning experience for the students and provided many ideas for future care possibilities.
ACKNOWLEDGEMENTS

We would like to thank the people that made this trip possible for us: the Pacific University Amigos Organization, the Mount Shasta Rotary Club, and a very special thanks to USAF Major Dennis Smith, O.D. for all we learned and experienced.

Also, special thanks to our thesis advisor Dr. Haynes.
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Chronology of Volunteer Vision Services in Baja California Sur

INTRODUCTION

This paper is a chronology of the experiences of three optometry students who travelled to Mulege, Baja California Sur. The paper is not a clinical study but rather a detailed report of a volunteer service project, including a description of the clinical setting and the characteristics of the population which was served. The results of our clinical findings are described without comparative evaluations to the clinical and experimental literature.

BACKGROUND INFORMATION

Baja California Sur (BCS) is one of two states located on the Baja of California, a peninsula approximately 800 miles long and an average of 60 miles wide. It is bordered by the Pacific Ocean on the west and the Gulf of California on the east making it a perfect winter retreat for deep-sea fishermen and watersports enthusiasts. La Paz serves as the capital city for the BCS; Mexicali the capital city of the northern baja. The land barely supports 2.7 persons per square mile due to chronic drought and the fact that only one-eighth of the land is arable (6, pg. 428).

Mulege, BCS, is a small village of approximately 4,000 persons; the people populating the surrounding rancheros and barrios of 10 miles radius boosts this even more. The town
is supported by tourism, agriculture and beef ranching although the terrain outside of the
town's oasis-like epicenter is so arid and mountainous that life is minimally sustained. It
has a freshwater river that flows through the town which enables the people to harvest date-
bearing palm trees each autumn. Without the freshwater river and the tourists seeking the
warm, blue waters of the Pacific Gulf and the untrampled beaches each winter, Mulege would
be isolated from the dollars and influence of America. Stratification of wealth is very
evident. Housing ranges from dirt-floored tin and grass shacks to extremely fashionable and
spacious air-conditioned homes. Mulege provides a wide variety of personal services, yet
health care is very limited. It is easier, perhaps more convenient, to purchase a fish taco
and pepsi at the corner vender than it is to have a decayed tooth removed or dry-eye
syndrome cared for. Small markets and commercial diving shops cater to the tourist with
American dollars.

A dentist from Mt. Shasta observed this in 1983 while he was vacationing in the area;
moreover, he decided to do something about the poor dental condition of the people. First Dr.
Ratley obtained sponsorship of the Mt. Shasta Rotary club, then he signed a contract with
Mexican government establishing permission to open a dental clinic in an unused portion of
the Centro de Salud, Center of Health, as it translates, were constructed all over Mexico
during the oil boom of the early seventies; although most never evolved to operational status
due to the later financial crisis and foreign loan burden.

Towards the later half of 1983, Rotarians from Northern California traveled to Mulege
to refurbish the unused portion of the Centro de Salud into a two chair dental clinic,
darkroom and lab. Rotarians returned again in January of 1984 and rebuilt a house to serve
as living quarters for the volunteers serving the Mulege Free Dental Clinic.
Two years after the first observation of need, an optometrist and his wife were flown in to provide a preliminary screening to verify need. Later that same year two fourth year optometry students from Pacific University and their advisor constructed a beginning optometric clinic and screened almost 200 school aged children. Of those children, 20% failed and were referred to an unknown agency for further and more extensive examination. Since the first vision screenings of the children of Mulege, more special instrumentation has been made available, as a result, more comprehensive examination and dispensing of prescription spectacles and pharmaceuticals has been possible.

Health care services in Mexico have undergone many changes in recent years. The changes have resulted into two factors: the changing attitudes of the Mexican government and the changing economics of Mexico. Life expectancy of the Mexican peoples has increased from 41.4 years in 1940 to 64 years as of 1978 and infant mortality has decreased. "Progressive" diseases, cancer, heart disease, diabeties and mental ailments are seen more now than the older diseases such as, malnutrition, respiratory infections, parasitic disease and diarrhea. The government has begun to consider health care a necessity for its people rather than a luxury it once was.

**AMIGOS at PACIFIC UNIVERSITY**

"Amigos" is spanish for friends. At Pacific University there is a small group of optometry students that are organized with the purpose of providing volunteer primary vision and health care to the indigent populations of the world. In particular, the efforts of
AMIGOS have been concentrated in the regions of Mexico, Central and South America; however, AMIGOS has been responsible for sending missions to the Fijian Islands in the South Pacific and the Dominican Republic in the Caribbean. Possible missions to Samoa and the Philippines await approval.

Since the greatest exposure of this organization has been with Spanish-speaking countries and whereas the group was once affiliated with the International chapter of Amigos de las Americanas, AMIGOS remains the group's name.

After AMIGOS became independent of Amigos de las Americanas, the Student Optometric Association at Pacific University accepted the organization as a subcommittee (4, pg. 1). Funding from S.O.A. was to be provided to AMIGOS for equipment, supplies, and travel. However, this did not occur. Realizing that affiliation with S.O.A. brought very few, if any benefits, in 1986 AMIGOS drafted a new constitution and separated itself from the title of "subcommittee of S.O.A." Since this move AMIGOS has received hundreds of dollars allocated from the Association of Students at Pacific University (A.S.P.U.).

Membership in AMIGOS has been open to any Pacific University student, staff, or faculty member that has an interest in volunteering time and energy necessary to organize and develop the various missions. Despite this open invitation to other Pacific interest groups, optometry students comprise 100% of the membership.

Fund raising for the organization has come from private donations, service club donations, and from the sale of gold frames to precious metal marketers. AMIGOS has found these sources plus ASPU funding to be the best methods.

AMIGOS tries to send those members that have been active participants in the club's fund-raising, spectacle verification, social functions and general business matters. Eligible
members are usually those who will have successfully completed their second professional year of optometric education (implying competency in retinoscopy, ophthalmoscopy, visual acuity testing, ocular pathology detection, and lens application theory) by the time the distribution program begins. However, second year students who demonstrate competency in these optometric skills are eligible to participate if there are not third or fourth year interns participating and interns are desperately needed. The policies and procedures of the constitution contain more specific, prioritized criteria for intern selection and funding (4, pg. 1).

AMIGOS de las AMERICANAS

Amigos de las Americas is an international, nonprofit, private, voluntary organization. Through Amigos International, young volunteers (60% of which are high school aged and 40% are collegiate) serve in public health projects in Mexico, the Caribbean, Central and South America. Since its founding in 1965, over 9,400 volunteers have performed more than ten million individual health services including immunizations, dental hygiene instruction, vision screening and distribution of eyeglasses, well-digging, animal health services and community sanitation. With more than thirty chapters nationwide, the headquarters is centered in Houston, Texas.

Volunteers for Amigos International must be at least sixteen years of age by June 1, or have completed their sophomore year in high school. The young men and women volunteers must meet the requirements of a six to eight month training program and pass several
screenings and a series of tests before final acceptance. They must dedicate time, assist in fund raising, and become an integral part of the group. Adult volunteers who plan and supervise the training are health care professionals, educators, engineers, lawyers and veteran Amigos.

Usually the volunteers who carry out the field program fall into two categories: they can be participants of ages 16 and over, which constitutes the bulk of the volunteers and are executors of the total program; field staff which are veteran Amigos ages 18 and over that are supervisors of the program and provide liaison between Health and Community Development Ministries. To train their volunteers, Amigos maintains a year-round program coordinated with the regular school schedule. Each youth-in-training receives approximately 125 hours of training during the six to eight month period from late fall through June. Youth volunteers spent time training in public health care, Latin American culture and conversational Spanish, human relations, leadership training and business and record keeping methods. Students can even receive high school and college credit.

Amigos de las Americanas has been recognized by the Pan American Health Organization and the Pan American Sanitary Bureau, western arm of the World Health Organization, by being granted affiliate status by each in March 1977. Also, Amigos is registered with the Advisory Committee on Voluntary Foreign Aid, Department of State and the Agency for International Development. Working relationships are maintained with the Institute for Nutrition in Central America and Panama, Ministries of Health, Direct Relief, AFS and Peace Corps.

Finally, the purpose of Amigos is to provide opportunity for American youth to explore their potentials and enrich their lives by furthering the life choices of those threatened by
common diseases in remote and lesser developed regions of our southern continent. Like *AMIGOS* at Pacific, the common goal shared by all volunteer health organizations is to be of assistance, to make the deprived a little better off (1, pg. 1).

**VOLUNTEER OPTOMETRISTS IN SERVICE TO HUMANITY (VOSH)**

VOSH is an international organization of volunteer optometrists who desire to provide vision care to other lesser developed nations (8, pg. 2). Individual state chapters have been established throughout the United States. Chapter directors act to encourage and co-ordinate volunteer efforts. The objective of VOSH is to take vision care "to those who have no such care available and who could not afford it if it were available." The volunteers examine the people of the area and provide eyeglasses for them as well as treat minor ocular infections.

Most VOSH missions take place in Central America and the Caribbean. The VOSH chapters often work closely with other service organizations to aid in funding of the missions. However, any costs such as air travel, lodging, and food must be arranged for by the mission members or funded by themselves.

Missions sizes vary from three or four to 100 volunteers and generally last about one week. One staff optometrist can screen approximately 50 to 100 patients per day under these conditions.
MAY-JUNE 1986 MISSION

OUR NARRATIVE VIEWPOINT

HOW IT BEGAN

On May 1986 at approximately 8:00 am we received a phone call from Dr. Don Ratley in Mt. Shasta, California telling us to pack and be at his home in eight hours. The drive from Forest Grove to Mt. Shasta takes at least eight hours which allowed us very little time to prepare. Four days earlier we were finishing up our second year of optometry school writing a final in pharmacology and despite frequent contact by phone with Dr. Ratley we were never certain as to whether or not plane travel to the remote village would be available for us. So, not one of us had realized that in fact we would be in Mexico examining strangers of another culture this particular summer. We had hoped but did not expect to go. Developing better communication skills with patients, improving conversational Spanish skills, experiencing hands on optometry vs. textbook optometry, cultural and geographic insight to the area and people, and the sun and surf of the baja were several expectations of our group.

Fortunately, we did make it to Ratley's home in time for supper that evening. Sangria and outdoor dining ironed out our wrinkled nerves as he briefed us on the people, clinic and customs of the village. Immediately after, we left for Vacaville and the awaiting Cessna airplane. We were to leave the following morning at daybreak since Mexican flight rules...
only allow for Visual Flight Plans to be filed (most Mexican airports do not have runways, lights, or pavement for that matter). Within 36 hours after the phone call from Ratley we had "buzzed" over our new "home" and its housekeeper and were awaiting her arrival at the primitive landing strip to haul us and our supplies back to the clinic.

OUR NEW HOME

After three rounds of Coronas, we realized that our ride wasn't coming. We decided our only alternative was to enlist the taxi driver to take us to town. We somehow, in our broken Spanish and despite poor directions, managed to find our way.

We began to get settled as the day progressed and spent our first meal eating at a local restaurant called Las Casitas, an initiation into the exotic. We thought the night was at an end, yet once back at the house we climbed the stairway to the roof and absorbed the sounds of what we would consider a typical Mexican evening. Our lights and the lights of our neighbors blacked out as the condensation from the humidity and heat accumulated on the power lines and transformers. Then the town came alive as families, dogs, poultry and goats flocked to the streets and curbsides to escape the heat of the indoors. The night sounds and the melody of a distant guitar blended together to establish an inner peace, a tone that would become the backbone of our adventure.

OUR WORKING CONDITIONS

Early the next morning our crew inspected and organized the disarray of ophthalmic supplies and instruments while the pilot and visiting dentist handled some of the business affairs of the Rotary club. The clinic, Centro de Salud, was located in the town-center of
Mulege, and consisted of an eight bed hospital with pharmacy, two dental operatories and an optometry suite. The clinic was staffed by one M.D., two medical residents, two nurses, one pharmacist and one administrative secretary. Dental and optometric care were provided by American volunteers and organized by the Rotary clubs of Mt. Shasta and Vacaville, California.

While the facilities lacked much of the sophisticated, high-tech equipment which characterized the average American clinic/hospital, the examination rooms and offices were neat, clean and freshly painted and the care was expertly and conscientiously provided by the small staff.

The optometry suite occupied a small corner of the clinic facility and consisted of a ten foot lane furnished with old, but functioning equipment. The chair, stand, projector and phoropter were made by American Optical and worked adequately. Unfortunately, the lamp stand was a memory and the Burton lamp was its poor replacement. Needless to say, the near findings suffered a little.

The slit lamp (Thorpe) was a temperamental relic that had seen better days, but when it worked it was an adequate means to evaluate external eye health. After the first few days, we used it only when it was necessary to get a better view than the ophthalmoscope provided.

The tonometer was an electronic applanation, digital readout, MacKay-Marg. While the instrument worked well and provided what appeared to be precise and accurate findings, it was difficult to operate with confidence due to the power surges that commonly occurred.

The lensometer, an old Zeiss, made a great paperweight. Fortunately, most of the patients we cared for had no habitual prescription, thus when it malfunctioned it was not too critical. We all got a little practice in "hand neutralizing" lenses.
The glasses available for distribution had all been provided through Amigos and were labelled as to the prescription. We spent a considerable amount of time attempting to sort and create a system for the spectacles that would allow easy distribution later. We separated low spheres, moderate spheres, and high spheres plus and minus powers. The cylinder lenses were kept in a separate section. Bifocal and trifocal lenses were categorized according to the distance portion and labelled as to the add and had to be searched for also.

The team members elected to rearrange the clinic layout to not only facilitate patient flow, but to maximize the quality of patient care (Appendix 1). This was done by dividing the clinic area into four stations, each to be managed by a team member. This allowed us to bring a new patient in approximately every ten minutes, providing a total of about forty minutes care for each patient depending on the patient and the communication problems encountered. The examinations were performed to our best ability in Spanish.

To set up the clinic we first moved all materials from the examination room except for the chair, stand, phoropter, tonometer, and biomicroscope. This room was used for the visual evaluation portion of the examination. Next, we converted an outside waiting area into our case history, visual acuity, and dispensing sections. An eye chart (illiterate E) was placed on the wall outside and a twenty foot distance was marked off for the visual acuity. The waiting area lacked a roof so daylight was available for lighting. In this area we also constructed some shelves out of spare lumber for our spectacles display and storage space. Finally, we converted an adjacent dental lab into our ocular health station. This allowed us to darken the room as necessary and provided some privacy for the patient. The stations were all located within a very small area so communication between all team members was easy and common.
EXAMINATION PROTOCOL

The patients entered the waiting area from the street and were accepted for care on a first-come first-serve basis. The visual acuity, distance and near, was ascertained and a case history taken. This history included the name, age, address, personal and family medical history, medications, allergies, sensitivities, and a statement of the chief complaint (Appendix II).

The patient was then moved to the adjacent dental laboratory where an ocular health assessment was performed. This consisted of extraocular muscle check, cover tests, pupillary reactions, ophthalmoscopy, and an external eye evaluation (Appendix III). If the examiner felt a more extensive external exam was necessary, a recommendation was made for a biomicroscopic evaluation at the next station.

The next step was the visual evaluation. The minimum exam consisted of the following findings: #4, #7A, #14B, #20, #21. Additional tests the examiner felt necessary were made on each patient. After this exam, a biomicroscopic evaluation, and tonometry were performed and an Rx given. The examiner(s) discussed the findings and the treatment plan with each patient and then escorted the individual back to the dispensing area.

The dispenser provided a pair of glasses that were as close to the recommended Rx as possible and reinforced the treatment plan of the examiner. If we felt the patient did not understand our recommendations or instructions, we consulted the clinic pharmacist who was bilingual. The patient was released only when the therapy plan was completely understood.
After a full morning, we felt ready to begin seeing patients the next day. The clinic preparations made, we decided to spend the rest of the day familiarizing ourselves with the area and the people. Our entire group headed for the beach and sunshine. This was the team's last chance to spend time with the pilot until he returned to pick us up. The Rotary had provided "toys" for all volunteers on their trips to Mulege and we took advantage of these. We spent the afternoon sailing (or learning to sail). This set the precedent for many afternoons to come.

OUR FIRST DAY...AND THOSE AFTER

The next morning we said goodbye to the pilot and our last link with "home". Then our real day began. Since it was virtually impossible to announce the opening of the eye clinic we had to rely on word of mouth to draw patients. The first day, thankfully, proved to be fairly light. We were not prepared for many of the complications that arose due to the language barrier as well as the much-used second-hand equipment. By the following day, we had learned the "system" and realized it would be difficult to predict a time schedule for seeing the patients. Many of the patients came as entire families and travelled distances over thirty and even fifty miles. This created a waiting line of mothers, fathers, and crying babies of up to ten or fifteen at once. It was impossible to turn anyone away so patients sometimes spent several hours waiting for care. It was felt this willingness to travel so far and wait so long showed the necessity of this type of care for these people.

In Mexican society, every afternoon about two o'clock all businesses closed for siesta. This is partially due to the intense midday heat as well as the "laid back" attitude of the people. This break allowed us to catch up and generally we were finished for the day. We
spent most of the afternoons at the beach since it was the coolest place to go and we were unaccustomed to the temperature. We found ourselves slipping easily into the "slow" flow of the Mexican society. We learned to dig for clams, tried windsurfing, sailed, and went sight-seeing. We learned much about the Mexican culture and were well accepted into the society once the people realized that we were there to help them.

The Rotary club provided a beach house as well as the house in town near the clinic and we elected to spend one weekend there. The house had no electricity or such luxuries and was located on a cliff that overlooks the gulf. The sunset and sunrise were the most beautiful we had ever seen. The weekend revived us for the next week of patients which was fortunate since word had circulated widely about our presence. The patient load was much heavier and people were coming from even greater distances. By the end of our second week, we even found ourselves running low on the most common low plus prescriptions.

We began to consider our return trip and wondered about the plans since we had had no word from Dr. Ratley. The days continued in a now typical pattern and still we had no word. Our lives back home again became reality to us and we felt it was time to return to the fast paced American society again. We finally heard from Dr. Ratley only to be told that the plane could not return for us. We were left with two options drive ourselves out of Baja California Sur or use public transportation for the trip. We lacked confidence in the vehicle at our disposal for such a long, hot trip therefore; we elected to use public transportation. This meant fifteen hours on a full Mexican bus for the first part of the journey. We all had our mixed feelings about this trip; regret over the end to the adventure, apprehension over the bus journey, and excitement over returning home to our lives that had been on hold for three weeks.
HOMEWARD BOUND

The return trip itself held many exciting moments. Immediately after we boarded the bus, a policeman followed. Of all the many passengers and after three weeks in Baja, we were asked for our visas. This created apprehension in our minds and thoughts of, what next! Later toward evening during one of the many stops, we happened to notice our luggage being taken from the bus. Of course after that close call we watched carefully at every stop. The bus trip certainly was not the most comfortable trip any of us had ever experienced and we all felt great relief and happiness once across the boarder into the United States where more comfortable, cleaner, quicker transportation methods greeted us. We caught a Mexican taxi to the border and then a San Diego trolley to the train terminal and finally to the airport. The next leg of our journey was a quick airplane flight from San Diego to San Francisico. An airplane had never seemed so wonderful as it did to us by then. We were picked up by Rotary members and taken to our car for the final part of the trip home. Despite some of the shakier moments the adventure provided each of us with wonderful memories and valuable experiences.

CLINICAL DESCRIPTION OF PATIENTS

A total of 140 patients were seen at the Mulege clinic during our three week adventure in June of 1986. An additional 97 patients were examined in October 1986 on a mobile unit trip near Mulege. Many of these people had never received vision care prior to our visit and it was very gratifying for us to be of aid. The data from both trips was combined and taken into consideration for this project. The patients ranged in age from two years old to
eighty-seven years old. See Figure 1 for distribution of patients' age. Twenty-five more females were seen than males; see Figure 2.

![Number of Patients by Age](image1)

**Figure 1.** Frequency of cases by number of patients (horizontal axis) is compared by ten year age intervals (vertical axis).

![Frequency of Females/Males](image2)

**Figure 2.** Frequency of cases by number of patients (horizontal axis) comparing females and males (vertical axis).
Table I

<table>
<thead>
<tr>
<th>Observations</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blur at Near</td>
<td>144</td>
</tr>
<tr>
<td>Itching of the Eyes</td>
<td>74</td>
</tr>
<tr>
<td>Blur at Far</td>
<td>72</td>
</tr>
<tr>
<td>Tearing</td>
<td>61</td>
</tr>
<tr>
<td>Asthenopia/Vague Complaints</td>
<td>39</td>
</tr>
<tr>
<td>Headaches</td>
<td>34</td>
</tr>
<tr>
<td>Photophobia</td>
<td>30</td>
</tr>
<tr>
<td>Red Eyes</td>
<td>23</td>
</tr>
<tr>
<td>Pain of the Eyes</td>
<td>20</td>
</tr>
<tr>
<td>No Visual Complaints</td>
<td>16</td>
</tr>
<tr>
<td>Eye Turn</td>
<td>7</td>
</tr>
<tr>
<td>Swelling</td>
<td>6</td>
</tr>
<tr>
<td>Medications</td>
<td>6</td>
</tr>
<tr>
<td>Injuries or Accidents</td>
<td>6</td>
</tr>
<tr>
<td>Diplopia</td>
<td>4</td>
</tr>
<tr>
<td>Discharge</td>
<td>3</td>
</tr>
<tr>
<td>Broken Rx</td>
<td>3</td>
</tr>
<tr>
<td>Medical History</td>
<td>3</td>
</tr>
<tr>
<td>Allergies to Drugs</td>
<td>2</td>
</tr>
<tr>
<td>Skin Abnormalities</td>
<td>2</td>
</tr>
<tr>
<td>Contact Lens Problem</td>
<td>1</td>
</tr>
</tbody>
</table>

Table I. Table I shows a distribution of the complaints addressed during the case history portion of the exam.

During the case history portion of the exam, patients presented with various complaints: the most common being blur at near and far, tearing and itching of the eyes. See Table I for further breakdown of the case history. The decrease in acuity at far and near was demonstrated by an illiterate E chart.

After the case history, we took a few entrance skills which included extraocular muscle motility, near point of convergence, cover test, pupil reactions. These entrance skills of the Mexican population approximated expected values of a Pacific University student.
population except for the near point of convergence. Near point of convergence findings were observed to be receded as shown in Figure 3. These findings were taken objectively by noting when the eye turned.

![Frequency of Near Point of Convergence](image)

Figure 3. Frequency of cases by number of patients (horizontal axis) is compared with .5 inch NPC intervals (vertical axis).

PATHOLOGY OR EYE HEALTH.

The most common apparent pathologic findings were pinguecula, pterygium, cataracts, arcus senilis, and conjunctival melanosis. Most of these complaints and conditions were attributable to the hot, arid climate and steady sun and wind. Table II gives a specific breakdown of the external and internal ocular conditions found in the entire population.

<p>| Table II |
|------------------|---------------------------|
| <strong>Frequency of External and Internal Ocular Health by Rank Order</strong> |                           |
| <strong>Observations</strong> | <strong>Frequency</strong>             |
| External         |                           |
| Conjunctiva      |                           |
| Pinguecula       | 76                        |</p>
<table>
<thead>
<tr>
<th>Cornea</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pterygium</td>
<td>39</td>
</tr>
<tr>
<td>Conjunctival Melanosis</td>
<td>27</td>
</tr>
<tr>
<td>Conjunctival Keratitis</td>
<td>10</td>
</tr>
<tr>
<td>Allergic/Viral Conjunctivitis</td>
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<td>Dry Eye</td>
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<td>Cutaneous Horn</td>
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<td>Hordeolum</td>
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<td>Papilloma</td>
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<td>Verruca</td>
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<td>Adnexa Cyst</td>
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<td>Chalazion</td>
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<td>Hemangioma</td>
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<td>Presumed Neurofibromatosis</td>
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<td>Trichiasis</td>
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<td>Posterior Segment</td>
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<td>Crossing Changes</td>
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<td>Superficial Retinal Changes</td>
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<td>Macula</td>
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<td>C/D &gt; .5</td>
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<td>Irregular Cupping</td>
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<td>Cup Variance</td>
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<td>Optic Nervehead Variation</td>
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Table II. The frequency of cases by number of patients who were observed with an internal or external ocular health abnormality.

The most common prescriptions were low plus spheres and plano sunglasses. Of the 237 patients thirteen were wearing spectacles. Distance refraction according to equivalent sphere of the right and left eye respectively is seen in Figures 4 and 5 which show the younger population having a mode at plano. Figures 6 and 7 indicate those patients 35 years and older also with a mode at plano with most requiring an add at near, see Figures 8 and 9. Anisometropia can also be observed in Figures 4, 5, 6, and 7.
Figures 4 and 5. Frequency of cases by number of patients 34 years and younger (horizontal axis) compared with distance refraction in 0.50D steps (vertical axis) for right and left eyes respectively.

Figure 6

Figures 4 and 5. Frequency of cases by number of patients 34 years and younger (horizontal axis) compared with distance refraction in 0.50D steps (vertical axis) for right and left eyes respectively.
Figures 6 and 7. Frequency of cases by number of patients 35 years old and above (horizontal axis) compared with distance refraction in 0.50D steps (vertical axis) for right and left eyes respectively.

Figure 8

Frequency of Accommodative Posture [*14b-7a OD] in Patients 35 Years and Above
Figures 8 and 9. Frequency of cases by number of patients 35 years old and above (horizontal axis) compared with Accommodative Posture in 0.25D steps as measured by 40cm binocular cross cylinder test (vertical axis) for right and left eyes respectively.

Figures 10, 11, 12, 13 show the range of relative accommodation which is observed when taking the #7a finding and subtracting it from the #20(PRA) and #21(NRA) findings. We would expect the #20-#7a to be close to -2.00D and the #21-#7a to be close to +2.00D.
Figures 10 and 11. Frequency in cases by number of patients 35 years old and above (horizontal axis) compared with range of Positive Relative Accommodation in 0.25D steps (vertical axis) for right and left eyes respectively.

Figure 12

Frequency of Negative Relative Accommodation [*21-7a OD] in Patients 35 Years and Above

Figures 10 and 11. Frequency in cases by number of patients 35 years old and above (horizontal axis) compared with range of Positive Relative Accommodation in 0.25D steps (vertical axis) for right and left eyes respectively.
Figure 13

Frequency of Negative Relative Accommodation
[‡21–7α OS] in Patients 35 Years and Above

+4.50D
+4.00D
+3.50D
+3.00D
+2.50D
+2.00D
+1.50D
+1.00D

0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5

Figures 12 and 13. Frequency of cases by number of patients 35 years old and above (horizontal axis) compared with the range of Negative Relative Accommodation in 0.25D steps (vertical axis) for right and left eyes respectively.

We attempted to provide patients with the best possible care that we could under the restricted conditions. This included providing spectacles as close to the prescription as possible. One hundred fifty-three prescription spectacles were distributed and nearly everyone received plano sunglasses for fun and protection.

CONCLUSIONS

Many of our personal goals and expectations were fulfilled during this three week adventure not only in Optometry but also our lives. We felt we gained experience in dealing with patients that would be helpful in our futures. Each of us had specific goals for improving our optometric skills. It was generally felt that our retinoscopy improved but we had hoped our ophthalmoscopy skills could have. Small pupils, inappropriate conditions,
and communication barriers prevented us from reaching this goal. The trip provided a chance for us to learn and improve our Spanish language skills. It was also a wonderful chance to experience a different culture. In the three weeks we were there, we incorporated ourselves into the medical system of Baja as well as the domestic patterns of the area. Since we tried to adopt their lifestyle, we were accepted into the community instead of being treated as other visitors. This allowed us to make good friends in Mulege as well as creating memories and a special bond between us.

SUGGESTIONS

We would highly recommend this experience to anyone interested in volunteer services. If we could retake this trip the only things we would change would be to create a uniform exam format (a specific set of findings) and if possible some better equipment (slit lamp and tonometer). It would be of interest to pursue the receded NPC findings to determine their validity. And phoria findings, far and near, should be incorporated into the exam. If possible we would also suggest a form of near retinoscopy such as LN-MEM. A comparison of our clinical findings with any future findings would be helpful in determining the validity of the variations in our findings from the expected values found in the population seen at Pacific University.
Appendix II

A. History and V.A.

1. Name
2. Age
3. Chief complaint
4. Personal and family history
   a. Current medications
   b. Drug allergies
5. V.A. e D & N with habitual R x
6. Lensometry

Name: ___________________________ Age: _____ Sex: ________

Chief complaint: ____________________________________________

Personal history: ____________________________________________

Medications: ________________________________________________

Allergies: __________________________________________________

V.A.: Distance

20/20

Current R x: OD: ____________________________

Add: 0.00

OS: ____________________________
Appendix III

B. Ocular health

1. Motility/mobility
2. Cover test
3. Pupils
4. Ophthalmoscopy
   a. C/D, A/V, ALR, FR, SYP, and Background
   b. WNL WNL notations
5. External (SLEX)
   b. WNL WNL notations
6. Tonometry

EOM: ____________________________________________________________

_________________________________ NPC: _______________________

Cover test: ______________________________________________________

Pupils: _______ mm _____________________________________________

__________________________________ M-G: __________

Ophthalmoscopy: C/D _______ A/V _______ ALR _______ FR _______

SYP _______ Bck ________________________________________________

Tonometry: OD _______ OS _______ Time __________
REFERENCES


