



IMPROVING COMMUNICATION BETWEEN THE PRIMARY CARE PHYSICIAN AND THE SPECIALIST IN LOS SANTOS, COSTA RICA¹

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Background:

The universal health care system of Costa Rica utilizes health care professionals in the community clinic to provide primary care to the population. The clinics employ general practitioners, nurses, health technicians, and registrars. The members of this team are responsible for providing basic health care services to the patients within their scope of practice and providing referrals to specialists when necessary. Maintaining continuity of care for the patients has been a challenge to those in the primary care setting due to the referral system currently in place. When a general practitioner determines that a patient requires the care of a specialist, a referral form is completed by the physician and is given to the patient. The patient is responsible for bringing the referral to the hospital, making an appointment with the specialist, keeping that appointment, and returning to the primary clinic with the counter-referral written by the specialist. Ideally, the primary physician would then be able to review the evaluation and recommendations of the specialist, obtain results of special exams, and follow through with the treatment plan.

Unfortunately, there are several problems inherent in the current system. The most important problem is the lack direct of communication between the general practitioner and specialist. Communication between these physicians is necessary to provide the highest quality of medical care while maintaining continuity of care. Other problems in the system include failure to address barriers that prevent patients from obtaining specialty care, inadequate record keeping within the primary clinics, and failure to have a system to evaluate the appropriateness of referrals. These problems create an inefficient system of referrals and prevent the patients from receiving optimal medical care.

¹ A Collaborative Descriptive research Project between IHCAI FOUNDATION and LINCOS. *April 2001*

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To address the problems within the referral system and to improve health care to communities in rural areas of Costa Rica, the country is adopting an innovative system of communication. The new system is called LINCOS, or little intelligent communities. LINCOS consists of portable containers that are equipped with multimedia technology such as computers, fax machines, access to the internet, telemedicine units, televisions, and educational materials. Alex Pentland of MIT and Jose Maria Figueres, former president of Costa Rica, founded LINCOS in 1998. By utilizing the technology found within the containers, the people of rural communities will have improved access to communicate with larger cities, better access of up-to-date information on a multitude of topics including health care, and many opportunities for advancement. With respect to health care, these units will allow primary physicians in rural areas to send email referrals to the specialist and receive counter-referrals in the same manner. This would allow for a much more expedient and efficient mode of communication. Appointments for the specialist could be made via email that would help the patient by reducing the number of times they must travel to the hospital. Also, the primary physicians would be able to use telemedicine to consult specialists at the hospital. This would reduce the number of unnecessary referrals, save the patient from traveling to a far away hospital, and augment the general practitioners' knowledge. Overall, the LINCOS system will improve the quality and continuity of care they receive in rural communities.

One of the rural communities chosen to have a LINCOS unit installed is Los Santos, a group of small towns located south of San Jose. Each town has a clinic to provide basic health care to members of the communities. However, in order for a patient to obtain specialty care, they must travel a far distance over narrow, steep mountain roads. This distance also creates a barrier between the physicians and hinders their communication. The hope is that these problems will be resolved by utilizing the technology found within the LINCOS unit.

Objective:

The purpose of this study is to evaluate the current referral system in the community of Los Santos and compare it to the referral system, which utilizes LINCOS. The evaluation will consist of an analysis of the referrals made by the general practitioners. This includes analyzing the number of referrals, the number of referrals to each specialty, the



number of appointments made and attended by the patients to the specialist, and the return of a counter-referral with the patient to the next clinic appointment in the primary care clinic.

Data will be obtained from the clinics and the hospitals during two time periods. The first time period will consist of data from the current health care system and the second set of data will be from a time period when the clinics are utilizing LINCOS. Our goal is to demonstrate an improvement in the efficiency, quality, and quantity of referrals from general practitioners who utilize LINCOS technology.

Methodology:

In order to compare the referral system with and without LINCOS we will analyze data from two time periods. The LINCOS unit will be operational in May of 2001. Therefore, referrals made in the months of January, February, and March of 2001 will be our control group, which operates without LINCOS. Referrals made in June, July, and August of 2001 will be our study group, which operated with LINCOS. The data we will obtain from the clinics in Los Santos for each time period will be the total number of referrals, number of referrals to each specialty, and the medical indication for the referral. This data will be obtained from the registrar who is responsible for keeping a record of referrals made at each clinic. Next, we will obtain data from the hospitals regarding the number of appointments made by the patients who were referred, length of time between referral and appointment, and number of appointments kept. Finally, we will review the Los Santos clinic charts of those patients who had an appointment with a specialist. The review will include obtaining the number of counter-referrals obtained by the general practitioner, the utilization of the information and advice given by the specialist, and the number of follow-up appointments kept by the patients in the primary care clinics after the appointment with the specialist.

By comparing the data accumulated for the control group and for the study group we will be able to assess the improvement of efficiency of referrals brought about by the incorporation of LINCOS into the primary care system of Los Santos.

Hypothesis:

Incorporating LINCOS technology into the current primary care systems in rural communities such as Los Santos will improve health care of the population in the following ways:

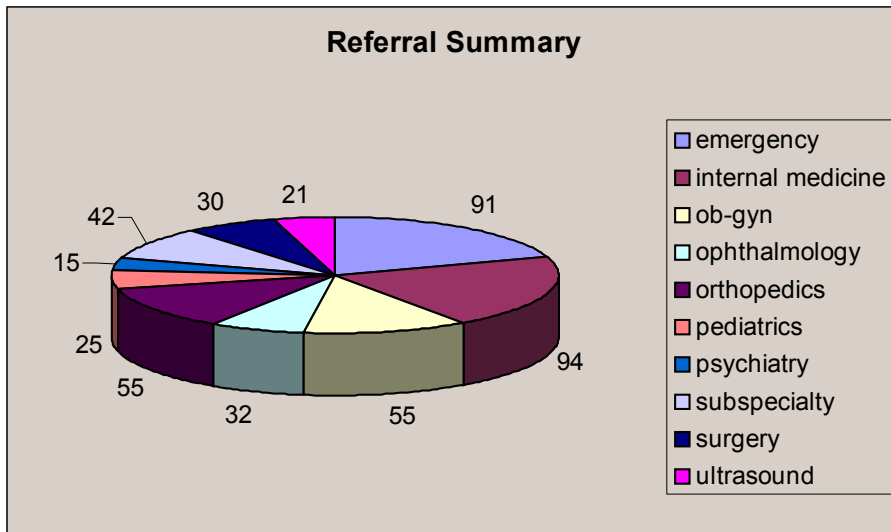
- ❖ Improve communication between the general practitioner and specialist
- ❖ Facilitate access to specialty care for the patients
- ❖ Decrease the quantity of unnecessary referrals
- ❖ Improve the utilization of recommendations given by the specialist
- ❖ Maintain the continuity of care within the clinics
- ❖ Provide the highest quality care in rural regions

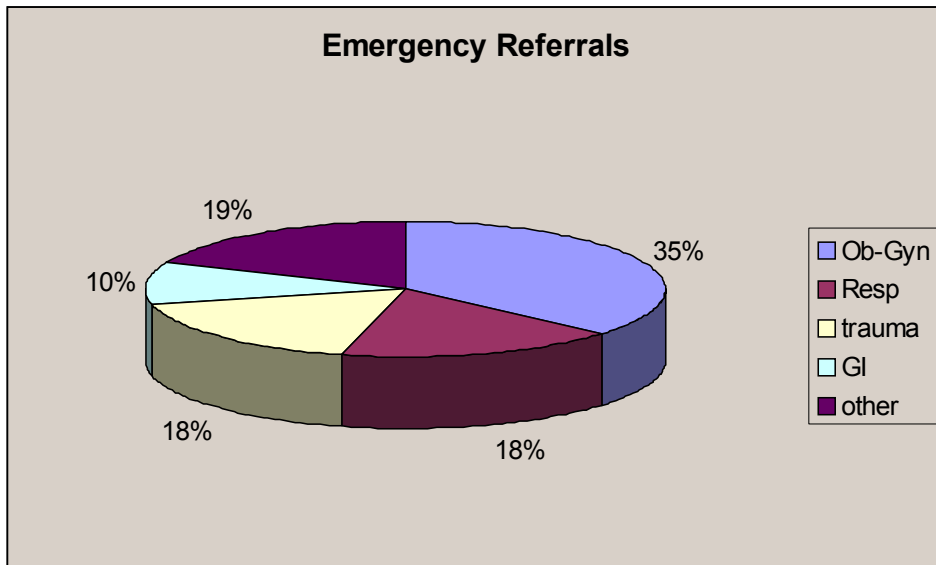
Significance:

This study will evaluate the referral system with and without the utilization of modern multi-media technology to demonstrate how access to such resources improves health care. Access to the internet, utilization of email and telemedicine, and other educational resources provide up-to-date health information to isolated communities. By incorporating information obtained from the LINCOS system into the health care system, smaller communities will be able to maintain the standard of primary health care provided by larger facilities in urban areas of Costa Rica. General practitioners will be able to utilize the most current guidelines recommended for managing a variety of medical conditions. Patients will be able to obtain most of their health care services within the rural clinics without having to travel to a distant hospital. Necessary referrals to specialty care for patients with serious health conditions will be facilitated. Earlier access to specialty care will help prevent complications from chronic illnesses such as hypertension, diabetes, and arteriosclerosis. Educational materials for patients will increase their awareness of the importance of obtaining preventive health services and choosing healthy lifestyles. All of these factors will improve the health care provided to the people of Costa Rica that will result in improved health and quality of life for the population.

Results of referrals 1/1/2001 through 3/31/2001:

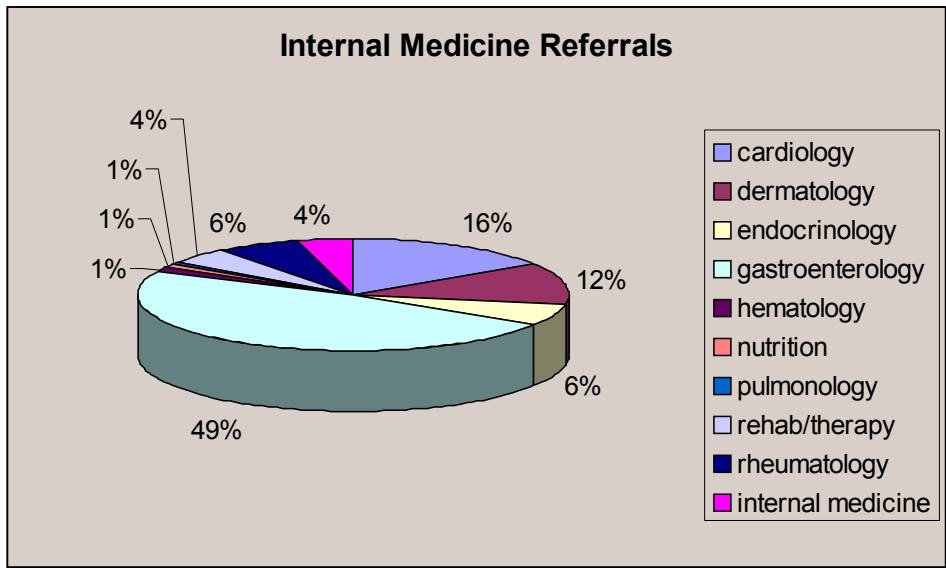
The referrals made by general practitioners in four clinics in the Los Santos area from January 1st, 2001 through March 31st, 2001 were collected from the registrars of each clinic. The total number of referrals made during that time period was 460. The referrals were analyzed by separating them into groups based on the specialty. As shown in the Referral Summary chart below, the majority of the referrals were made to emergency(20%) and internal medicine (20%). Within the emergency medicine referrals,



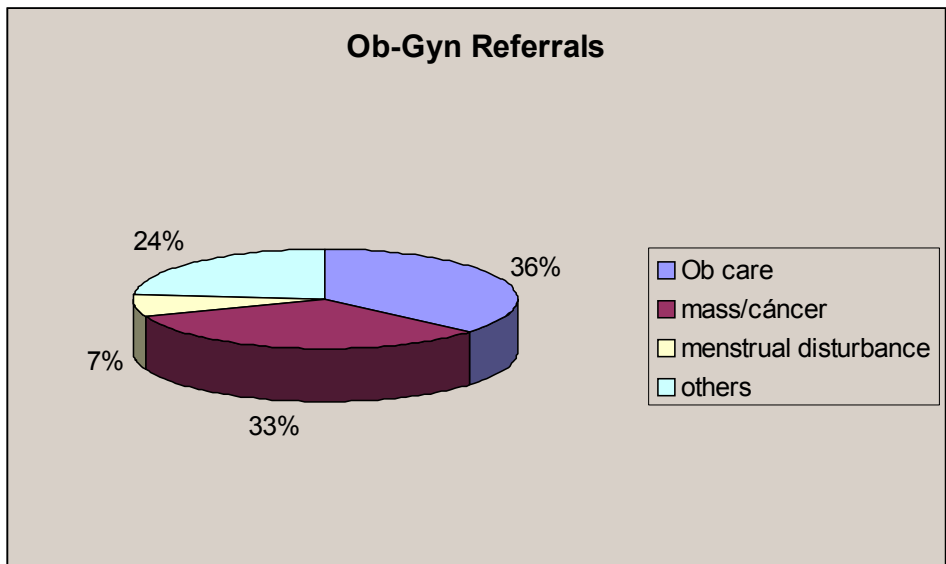


35% of the referrals were for obstetric/gynecologic care. Respiratory illnesses comprised 19% of the referrals to the emergency room, while trauma was the third most frequent referral at 18%.

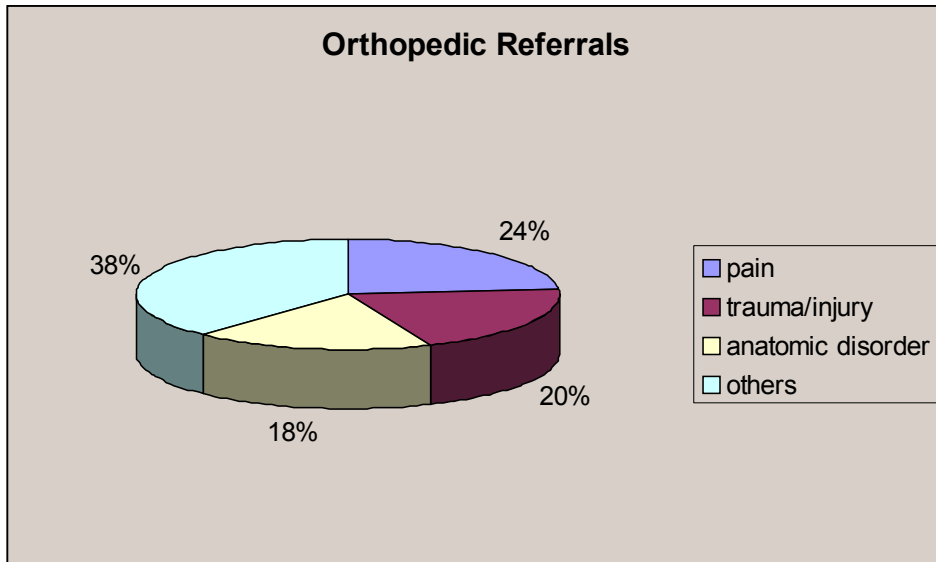
Internal medicine referrals consisted of all referrals to an internal medicine physician or other specialty within the field. The analysis below shows that the majority of referrals were to gastroenterologists (49%). The second most common referral was to cardiology (16%) and then to dermatology (12%).



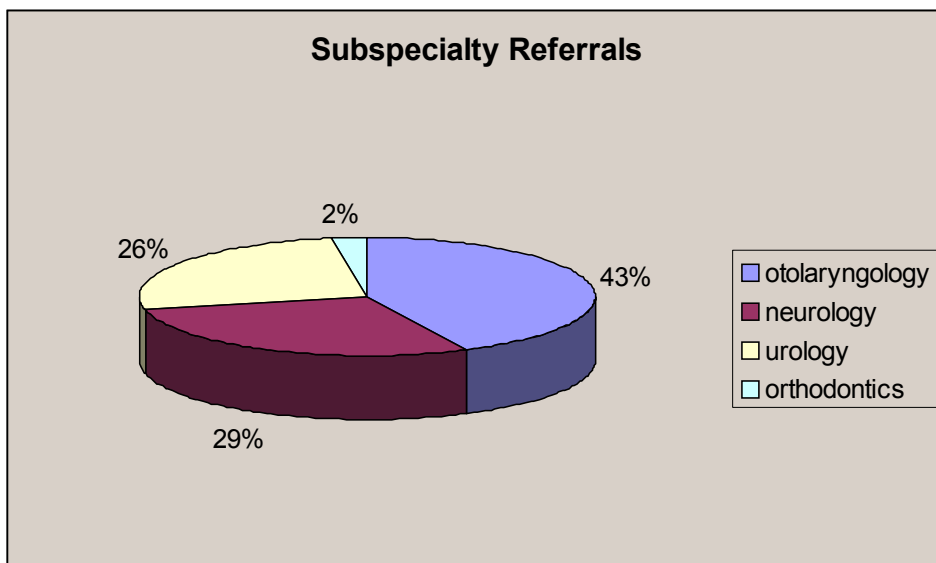
The specialty of Obstetrics and Gynecology received 12% of the referrals; however if referrals for obstetric ultrasounds were included in the number of referrals, the percentage would be 15%. Obstetric care, breast masses, and gynecologic cancers were the three most common diagnoses for the referrals.



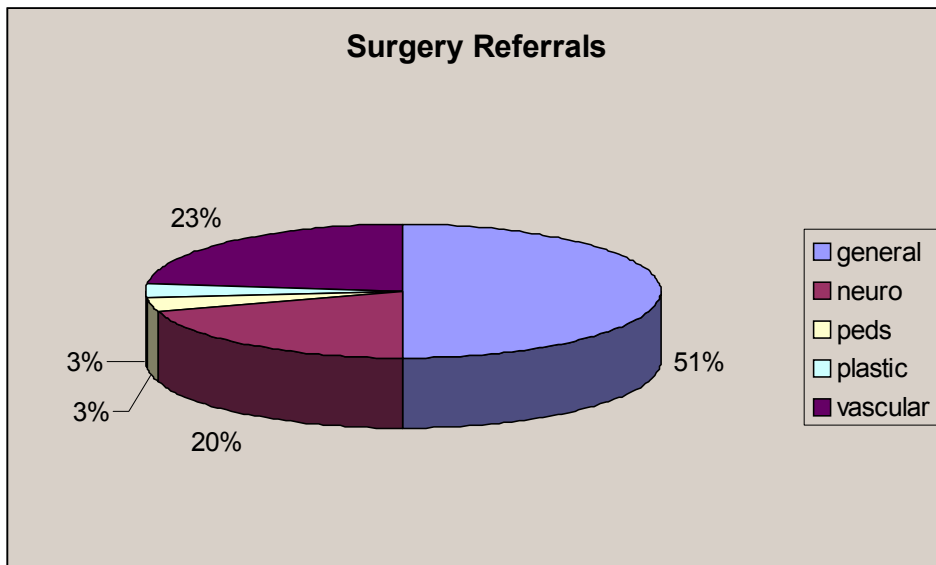
The number of orthopedic referrals also comprised 12% of the total. The three main diagnoses for these referrals was pain (24%), followed by trauma (20%), and anatomic disorder (18%).



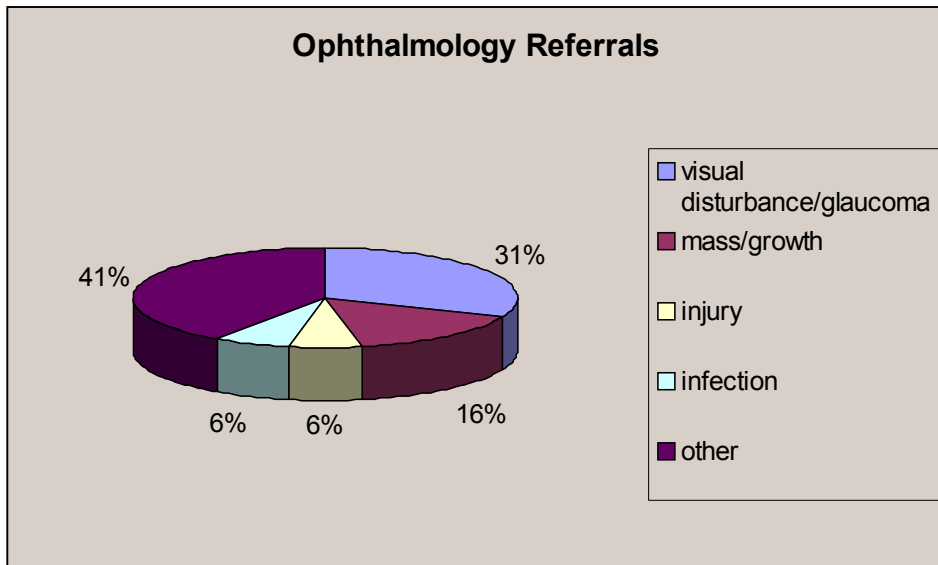
Referrals to sub specialists comprised 9% of the total referrals. Otolaryngology received 43% of those referrals, while neurology received 29%, and urology received 26%.



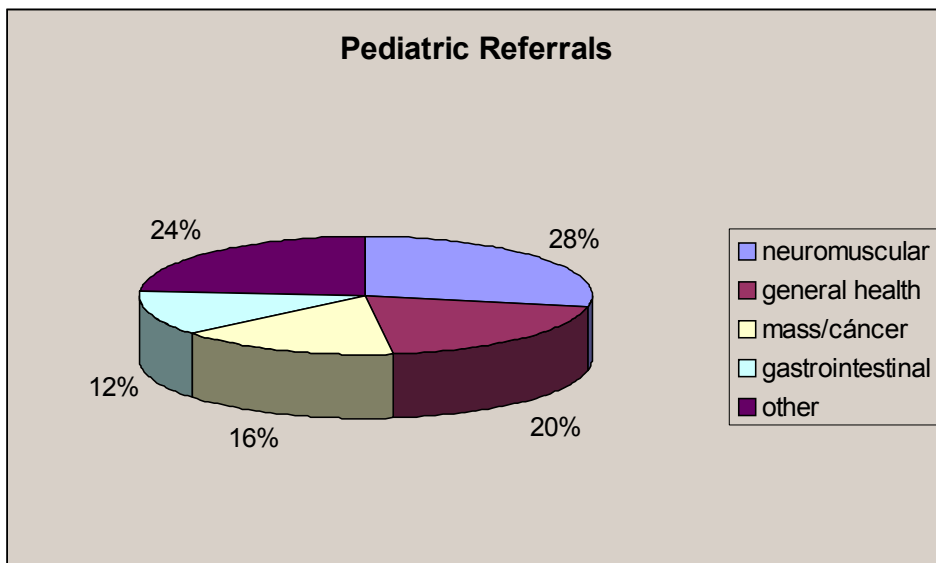
The next most frequent referral made was to surgery and surgical sub specialists (7%). General surgery received the majority of the referrals (51%), vascular surgery received 23%, and neurosurgery received 20%.



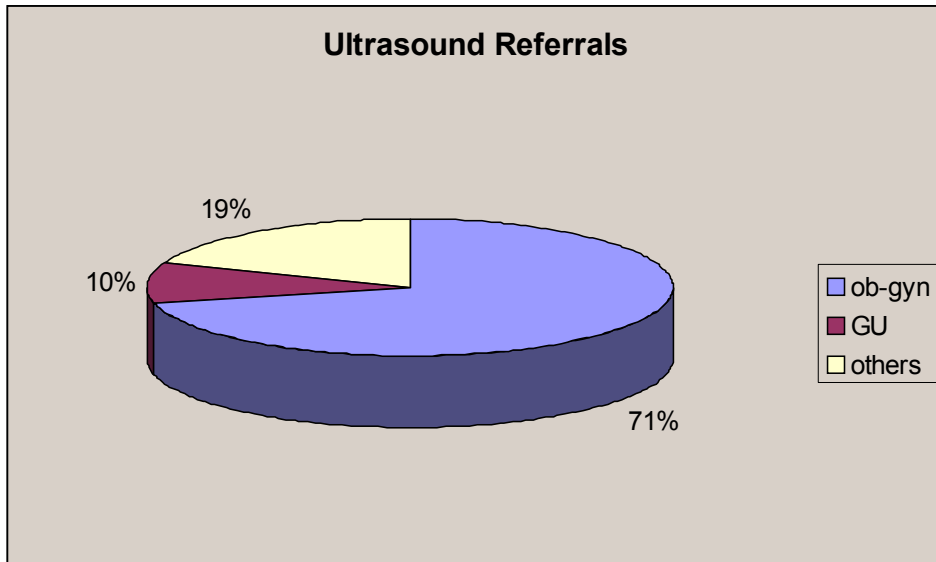
Ophthalmology also received 7% of the total referrals. Visual disturbances (31%) and growths (16%) accounted for the majority of these referrals.



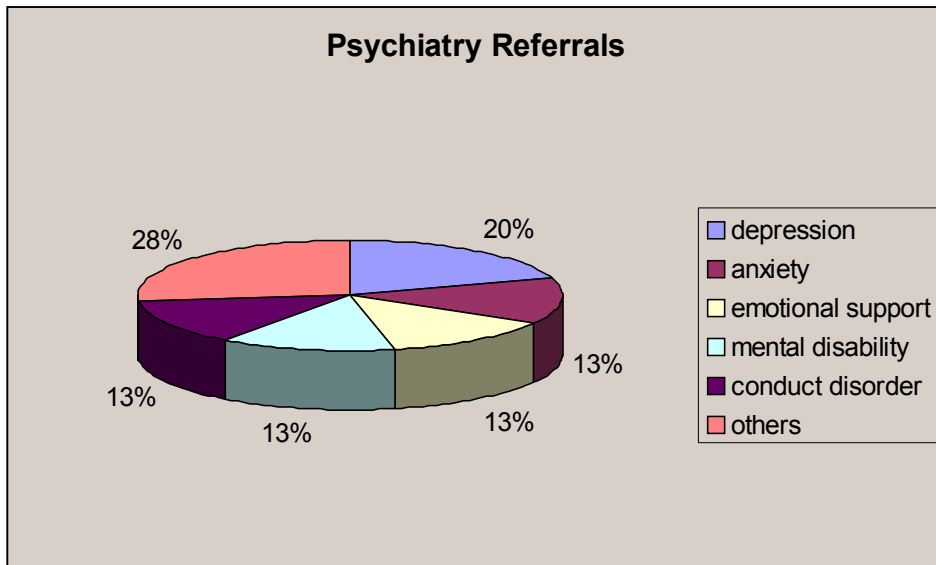
Only 5% of the referrals were made to pediatrics. Neuromuscular disorders accounted for 28% of the referrals, while 20% were for general health concerns.



Ultrasound referrals also comprised 5% of the total referrals. As briefly discussed above, the majority of ultrasound referrals (71%) were indicated for obstetric or gynecologic reasons.



The group of referrals accounting for 3% of the total was to psychiatrists. Depression was the reason for 20% of these referrals, while the diagnosis of anxiety, emotional disorders, mental disability, and conduct disorder each accounted for 13%.



Discussion:

The data from the results above provides information regarding the total number of referrals made, the medical reason for the referral, and the specialty to which the patient was referred. This information will be part of the analysis of referrals in the control group, which represents a period of time before the implementation of LINCOS. Additional information to be obtained regarding the control group includes the number of patients who made and kept their appointments with the specialists and the number of counter-referrals received by the primary care physician in the Los Santos clinics.

Several observations were made during the collection of the above data. One factor, which limits the study, is the inaccuracy of information regarding referrals, which was obtained from the clinic registrars. Each clinic had a different system of documentation of referrals. Three of the four clinics evaluated had their referral information stored on a computer system, while one of the clinics had a secretary handwrite the referrals into a notebook. While the computer generated lists were much easier to read, both types of records were noted to have inaccurate or missing data. For example, there were referrals to ophthalmology for an EKG, referrals to otolaryngology for diarrhea, and many of the diagnoses in the record of the referral to the specialist were left blank. These transcription errors could be avoided by keeping a copy of the actual referral. Or once



the LINCOS system is operational, it will be possible to send a copy of the referral using email or fax machines.

At this point in time the data, which has been collected regarding referrals, is objective information, which may be utilized in the future to compare the referral systems before and after the installation of LINCOS in the community of Los Santos. It will be possible to analyze the quantity of total referrals, the medical indications for the referral, and the number of referrals to each specialty. The percentage of patients who follow through with their appointment to the specialist and the percentage of counter-referrals obtained by the primary clinic will be important factors in analyze as well. The goal is to demonstrate an improvement in the referral system in Los Santos with respect to communication between health care providers, ease of access to specialty care for the patients, and overall improvement in the well-being of the population of Los Santos.