CINTERANDES' MOBILE SURGERY PROGRAM

Background

The program was organized in response to the difficulties that people in the countryside face to access surgical care. Problems in transportation, lodging in the city, long lines at the hospitals and leaving their homes, crops and animals unattended, make for them, the attention of a surgical problem, a very complicated endeavor.

On the other hand, we are living the paradox of technology: on one side we have great scientific and technological progress, designed for the wellbeing of mankind, and on the other, the everyday widening gap between a few who have more than what they need and the vast majority of people who do not have enough to survive. The high cost of technology, makes its achievements inaccessible to more and more people every day.

This contradiction is also evident in surgery. We are able to replace and transplant damaged organs. We can model the human figure to restore beauty that time has taken away, or to give beauty that nature has denied; Tele-surgery allows us to operate in a remote geographical location; endoscopic surgery enables us to operate inside of the organism without opening de body cavities. Yet, in spite of all of these advances, several mothers and children die, because they do not have access even to a simple Cesarean operation. Many people in the country or in the slums of the big cities die or are subjected to long periods of pain and incapacity due to a perforated appendix or a strangulated hernia, problems that could have been solved easily with a simple procedure performed in a timely manner.

Until now, we have not been able to apply our knowledge to benefit the mass of underserved people. As surgeons and teachers, we have the duty to pursue excellence and strive for the progress and perfection of our science and art, but we believe that it is equally important, especially for surgeons in the developing countries, to search for new methods and systems to make that progress readily accessible to the common people.

With these principles in mind, the aim of our project was to take the operating room to the countryside and to the most disadvantaged neighborhoods of the cities. Progress in ambulatory surgery has made it possible to perform several types of operations and discharge the patient on the same day. Thanks to progress in anesthesia, the recovery after surgery is faster and with less untoward effects for the patient. The operating room is a limited space, relatively easy to equip and maintain. The areas required for patients preparation and postoperative recovery are also easy to arrange.

Contact with international medical missions, such us Project Hope and INTERPLAST, inspired the idea of taking medical care to underprivileged areas of the country. If foreign doctors and nurses were offering their services to our country, it is certainly a duty of Ecuadorian medical personnel to do the same for our own people.

There are mobile hospitals, some on water like the ship Hope; some on land, such as the Military Ambulatory Surgical Hospitals (MASH); and an ophthalmologic operating room has been installed on an airplane. It has been said that General Rommel, the Desert Fox, had an operating room in a vehicle, next to his tent during the African campaign in the Second World War.

When the idea was presented, we did not find, at the beginning, any support in the academic and professional environment. Two main objections were presented:

First: surgery should be done in a hospital where all the human talent and the technological support are readily available. Our response was that an operating room is a limited space, relatively easy to arrange with all necessary equipment; so is also the case of the recovery room and a preparation room. A well trained surgical and anesthesiology team is the answer to the demand of human talent.
Second: the infection rate will increase without the protection of a sterile environment. We think that we can clean and sterilize an operating room in a truck as well as we do in a hospital; in addition, the community germs are much less aggressive than the hospital germs; a clean and sparkling hall in the hospital is much more dangerous than an open field in a community. Now, after more than 9,000 operations performed with excellent results and a very low complication rate, we have the evidence that we were right.

With these premises and examples, the idea that an operating room could be set on a truck was born. A mobile surgical unit was assembled and a new milestone in the history of mobile surgery began.

THE ORGANIZATION

Requirements for a Mobile Surgery Program

In order to carry out a Mobile Surgery program, I think that four requirements are absolutely necessary:

1 - An institution to back up the program and take charge of all organization and financial activities.

2 - A well-structured and written program so it will be no room for improvisation.

3 - A well-trained team to execute the surgical work.

4 - Material resources.

The Institution

The institution could be a Governmental agency, either from the Central government or a regional or local government; a Nongovernmental organization, either for profit or non-profit. In our case, we decided for a non-profit private organization: The Cinterandes Foundation

The Cinterandes Foundation:

Cinterandes is a nonprofit, nongovernmental organization devoted to serving our fellow human beings, contributing to solve the most common surgical problems, taking care of the general health situation and promoting human development.

Cinterandes is a concept, a believe system, a way of life. In order to be a member of the Institution and participate in its programs.

The Program:

The team has to work to develop the original idea and elaborate a program containing the conceptual framework, objectives and the strategy to be used to reach these objectives,

In our case, we elaborated a program and published it in a Procedures Manual with the following contents:

- Principles and structure of the Mobile Surgery Program.

- Guidelines for the diseases we intended to treat and its diagnostic procedures.

- Protocols for surgical operations.

- Protocols of some research projects.
An instructive to organize different activities: surgical missions, preoperative evaluation, postoperative follow up, etc.

Responsibilities of each team member.

The instructive and the protocols were written in a check list manner

The Team

Nowadays, any important endeavor is far beyond the capacity of a single individual. It is absolutely necessary to organize a team with several persons. The organization of the team was carried out before we develop a program to. The team is important to start with, not only because of the importance of human talent, but because the members of the team will help to develop a concrete program from the original idea. Material resources are at the end because only when you have a detailed program will you have a clear idea of the needed resources.

The members of the team have to be carefully selected. They must have some fundamental characteristics if we want to work in harmony. The most important qualities should be:

**INTEGRITY**: is “The quality of being honest and having strong moral principles; moral uprightness” (New Oxford American Dictionary). This quality is of utmost importance if we want to trust each other and share the care of our patients. Trust is fundamental to work together and accomplish our goals.

**PROFESSIONAL EXCELLENCE**: If we want to help others, we should be qualified to do so. People who trust their lives in our hands, deserve to be taken care of in the best way possible, and in order to provide the best care, we have to be prepared for it. In humanitarian work, there is no place for mediocrity.

**TOLERANCE AND UNDERSTANDING**: Working together requires the capacity to understand and tolerate differences of opinion and behavior. Everybody is different and it is necessary to accept other’s ideas and, to be willing to compromise and take collective decisions.

**ADVENTUROUS SPIRIT**: The work we were planning to do is out of the conventional. It requires taking chances and risks, going to places of difficult access and staying where there are not the usual commodities. Mobile Surgery is some kind of a frontier work and requires an adventurous spirit.

**COURAGE**: Difficult tasks require courage to start, to continue in spite of failure and to persevere until the end. Courage is necessary to acquire and keep all the above mentioned qualities. Winston Churchill said: “Courage is the finest of human qualities, because it guarantees all the others.”

With these criteria, we organized a team of surgeons and anesthesiologists, and we started to work together organizing missions to the small hospitals in the Ecuadorian Amazon jungle. We participated in ten missions, for three years, before the Mobile Surgical Unit (MSU) arrived in Ecuador. This experience gave us the capacity to work together with limited resources, in difficult circumstances and made us to understand the power of the group.

Before we started our work, we integrated to our team, a nurse, an operating room assistant and a driver. This personnel has been of vital importance to assure the success of the program.

Material Resources.

Obtaining the material resources was a quest of 15 years. Several Governmental and nongovernmental organizations refused to finance the program, until General Motors instructed its subsidiaries in Ecuador to do so. Aymesa, Maresa, B.B. Botar and Fundación Grupo Aymesa financed the Mobile Unit; Ecuadoreans in the San Francisco Bay Area and Ecuadorean ladies in Washington D.C. provided the equipment. The University of Cuenca and The University of Azuay gave full academic and material support to the program.
Program Description

Over the past twenty seven years, THE CINTERANDES FOUNDATION, in cooperation with the University of Cuenca and University of Azuay (Ecuador) has introduced into the Andean mountains, Coastal region and Amazon jungle of Ecuador, this different and innovative method of surgical care: Mobile Surgery (MS).

Despite facing many hurdles and disadvantages, the project has been successful in providing specialized medical treatment to people that otherwise have had no option for attending their surgical needs. In many aspects, we believe that we not only met our expectations but that we have well surpassed them by integrating components that were not thought of when the program first spun its wheels.

On a 24-foot Isuzu van, an operating room and a preparation room were installed. We could have used more space, but a bigger vehicle is difficult to drive in the winding and narrow Andean roads. The operating room has all the basic surgical and anesthetic equipment including a laparoscopic tower.

Compartments for medicines and surgical supplies are built into the walls of the room. The unit also contains a preparation room with a scrubbing sink, an autoclave and cabinets for supplies.

Rural doctors, contacted by our personnel, perform the first screening of patients with surgical problems. Initially we worked with children in local schools, but later we had requests from adults, so we cover patients of almost all ages.

When the rural doctor has selected a group of patients, a surgeon and anesthesiologist from THE CINTERANDES FOUNDATION, go to the area to make the preoperative consultation, in which a careful history and physical examination are carried out. The accuracy of the diagnosis is checked and laboratory and image exams are requested, when necessary. Based on numerous reports and our experience, we do not ask for routine laboratory or imaging tests.

Selection of patients is very important. We do not operate on individuals with additional, important pathology, patients of very advanced age, overweight patients or when we anticipate a complicated operation. Once patients have been selected, we explain to them or their parents, the operation and its risks, as well as the risks of not operating and leaving the pathology unattended and obtain an informed consent. We give the preoperative instructions and decide the day we are going to bring the MSU for surgery.

The day of the operation, the MSU is properly cleaned and sterilized. It is parked next to a health center, a school or a community house where a preparation room and a recovery room are arranged. Sometimes we arrange these facilities in two or three tents.

The day of the operation, patients are again interviewed and examined to make sure they followed the preoperative instructions and did not develop any additional pathology such as respiratory or intestinal infections. According to the surgical procedure, different types of anesthesia are used: general, spinal, regional or local.

The operation is carried out meticulously and according to a pre-established protocol.

After surgery, patients are carefully monitored until they recover and are sent or taken home when they fulfill discharge criteria that have been determined and when there is no risk of anesthetic or immediate surgical complications. They are left in charge of the local medical team but a surgeon and anesthesiologist of CINTERANDES are continuously available by phone for consultation and a home visit if necessary.

Sometimes, we park the Mobile Unit adjacent to a Hospital. This is justified, because in Ecuador there are several small hospitals that, in spite of having an operating room, do not have the adequate personnel and functioning equipment. So, being next to a hospital we can use, besides our MSU, the hospital operating room and the beds for hospitalization of patients who need it.
We do the postoperative control in person or using telemedicine. Patients are seen or tele-interviewed, after one week, one month, six months and one year.

**Advantages of Mobile Surgery**

We believe that mobile surgery makes it possible to deliver high quality surgical care with excellent results and an acceptable rate of complications, similar to the most advanced centers in the world.

We can reach patients that otherwise would have little or no opportunity to take care of their surgical problems, due to their remote location and the difficulties in transportation.

Surgery is performed in a more humane way since patients are not separated from their own habitat. They are spared from long trips to the city, long lines and time consuming waiting periods at the hospital where many times they do not receive the treatment or respect that they deserve. Children from the countryside do not have the trauma of the separation from their family and environment.

Human interactions in this system are extraordinary:

Doctors are freed from their busy city schedule, and a full day in the country gives them ample time for a more personal relationship with their patients and families.

This quiet environment is excellent also for teaching students and residents, in peace and with patience.

Rural and local doctors, move to another level of work, leave their routine, continue learning and become more motivated.

Doctors, nurses and auxiliary personnel, experience real teamwork and responsibilities are shared equally. Everybody realizes, for example, that cleaning the operating room is as important as performing the operation meticulously; thus, a “spirit de corps” develops, clearly for the benefit of patients and families.

Patients and relatives become closer by sharing the burden of the surgical experience through immediate postoperative care. The first thing that children see, when they wake up in the postoperative tent, is the face of their mother or father.

Community participation is something very pleasant. They contribute with food for the surgical team or bring simple presents such as eggs, fruit or chicken.

The surgical ritual has been simplified without affecting the surgical principles. In several instances, during surgical interventions, tradition has established some procedures that have prevailed against evidence in contrary like unnecessary laboratory and image tests, overuse of tubes, dressings and medication and excess of surgical instruments.

The cost of the mobile service is extremely low if you compare it with the cost of hospital surgery.

The inclusion of teaching and research in Mobile Surgery, materializes the university principle of taking teaching, research and service out of the university walls, directly to the heart of the community.

The concept of “mobility” is changing the health delivery system. If surgery with all its complexity, can be performed in a mobile way, any other field of medicine can be taken care also in this manner.

The new technological achievements in communication and telemedicine are opening new horizons in medical practice. If science and technology are adequately oriented, our health programs will reach out communities in the most remote places of the globe.
RESEARCH PROGRAMS

We are always conducting some research programs, comparing the mobile system with the standard hospital care, regarding to complications, costs and patient acceptance. We also study alternative surgical and anesthesia procedures, looking for I for improvement and striving excellence in our health delivery system.

TELEMEDICINE

Telemedicine is an excellent complement for our mobile surgery program. Sometimes, Telemedicine is used because the technology is available and not because is necessary for solving a real problems. This is justified, because what is now an experimental program may be of practical use in the future. In our case, we started to use it to improve the results of an existing surgical program. When we used fax, telephone or mail to send or receive information about patients, we were not aware that we were already doing telemedicine.

We have conducted several telemedicine projects in the different stages of our surgical missions.

The pre-operative consultation has made us more effective in organizing the operating schedule, patient evaluation and selection and foreseeing medical supplies. It has also enabled us to save precious time during our remote visits, which, in turn, translates into more operating room time.

During the operation, we have used telemedicine for tele-mentoring, consultation, and medical education.

In the post-operative period, our surgeons have been able to conduct follow-ups of their patients at a distance, assessing the surgical wounds for signs of potential complications. Therefore, telemedicine allows us to maintain contact with our patients for close surveillance until their complete recovery, overcoming one of the main constraints of mobile surgery. This has also been validated by a study showing 97% agreement between the surgeon in a remote location and a physician on site.