

International Oral Care: A Proposed Model for the Humanitarian Dental Missions

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Abstract

The creation of a good "field hospital" operating in the humanitarian missions has ever been the main aim to reach in any humanitarian missions. The Authors want to propose a model for all the humanitarian dental missions, so to standardize the activities and to make the results predictable in all the missions: this model has been named "International Oral Care" project.

In the light of the experiences in the previous humanitarian missions, we have developed and standardized a protocol that provides a complex organizational planning for each phase of the mission. Our strengths are the "Dental-Marquee", the "Dental-Ambulance", the "Dental-Roulotte" and a well-tested operative workflow.

In the last 3 years of activity on the field, International Oral Care has achieved an increase of treated patients, certainly consequential to the increase of operators on the field, but also due to the optimization of internal processes and the improvement of organizational structures.

IOC has achieved in recent years an organization optimized and highly predictable: this makes it a model for humanitarian missions in the field of dentistry, a model that could be adopted also by international NGOs operating in war zones, or in the major natural disasters.

Key words: Humanitarian mission, Oral health, Dental education

Introduction and Background

The humanitarian missions are social activities, which often require the presence of health care professionals, such as doctors, nurses and paramedics. During the last twenty years, the growth of the professional figure of the dentist and an increase of the need to detect and treat diseases of the oral cavity has led to the development of dental solidarity activities [1]. These activities are usually organized by cultural associations, or by non-profit organizations, however, the complex activity of diagnosis and therapy makes it difficult to reach a good level of performance in an atypical working environment, with respect to dental practices operating on Italian territory. The creation of an operative "field hospital" has ever been the main aim to achieve in the humanitarian missions [2]. The Authors want to propose a model for all the humanitarian dental missions, so to standardize the activities and to make the results predictable in all the missions.

"International Oral Care" Project

The realization of a humanitarian mission represents a moment of aggregation among those who participate in it, so it's important to identify all the participants with a brand: the brand that has been chosen by the authors is "International Oral Care", abbreviated with the acronym IOC, and represented by a characteristic logo (Figure 1) which will appear on the clothes (T-shirts, operative uniforms, caps) and transport vehicles that are involved in the missions: this brand, therefore, distinguishes the humanitarian missions organized by Marrelli Group. The Marrelli Group has 30 years of experience in the field of medicine, dentistry and oral sciences, and it consists in a team of more than 180 professionals, working in a dental clinic, in a big private hospital and other healthcare buildings covering more than 12 square kilometers in the city of

Crotona, in the south Italy. The project "International Oral Care" was born in 2011 with its first mission in Albania, at the city of Shkoder. In the following years, we have optimized the operational phases, have standardized the procedures, and the protocols were tested to obtain an organizational model that can be used by all healthcare professionals who would like to perform humanitarian missions in the dental field. All the mission by IOC is performed in accordance with the "Ethical principles for medical research involving human subjects" of Helsinki Declaration; the humanitarian activities and the treatments was performed in accordance with Italian laws and regulations. Informed consent was received from all the patients undergone to oral and maxillofacial treatments.

The key-points for the success of the mission

In the light of the experiences in the previous humanitarian missions, we have developed and standardized a protocol that provides a complex organizational planning for each phase of



Figure 1. The logo of International Oral Care and its applications in the mission.

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the mission. However, there are some key points that form the basis for entire organization.

First of all, the dental activities were held in the “Dental-Marquee”: it is an inflatable tensile structure, 112 square meters wide and 4 meters high, this structure is easily transportable, in fact it is completely deflectable and enclosable in a specific container that takes just 1x0.8 meters. The Dental-Marquee is a versatile structure, it provides wide spaces and an air-conditioned environment, where perform the clinical activities: the inner surface is 112 square meters large, and it is properly conditioned by two external air conditioners, each having a power of 12,000 BTU. The Dental-Marquee allows the installation of more than 6 dental chairs, inclusive of technical furniture (Figure 2); the Dental-Marquee is powered by 2 generators of electricity, working with diesel, to be autonomous even in areas not served by electricity: these 2 generators are capable of producing an output of 5.5 kilowatts / hour.

An important function of support to the more complex operations is carried out by the “Dental-Ambulance”: it is an ambulance that contains inside a modern dental practice, also equipped to perform the maneuvers of oral surgery and dental implantology; the dental-ambulance has a latest generation dental unit, an LCD monitor full-screen 46-inch for the projection of x-rays, a digital X-ray machine that works with low emission of radiation, to perform panoramic radiography of the dental arches, and an intraoral X-ray unit managed by a software for data acquisition, analysis and cataloging of images (Figure 3). The opportunity to transport the Dental-Ambulance is useful in those missions where it is essential a mobile location of the dental radiology area.

The sterilization phase is a critical moment in the operational process of a humanitarian mission in the medical field: in this regard, we developed the “Dental-Roulotte”. It is a modern roulotte where the interior spaces were optimized in order to adapt them according to the most rigorous regulations governing the sterilization zone of medical and dental practice. Within the Dental-Roulotte, there are 2 modern autoclaves, equipment for sterilization and bagging of the instruments, and storage areas for waste and potentially infective biological waste (Figure 4). Even if the space is



Figure 2. A miscellaneous of images of The Dental-Marquee.



Figure 3. A miscellaneous of images of The Dental-Ambulance and of X-Ray area.



Figure 4. A miscellaneous of images of The Dental-Roulotte and of sterilization area.

small, it has been designed to obtain two separate pathways, one for the dirty instruments and one for the sterilized one.

Planning of the mission

Each mission has its own peculiarities, its purposes and its problems; however, to get a predictable result, it is important to follow a planned process of organization for at least 6 months before the start date of the activity. International Oral Care (IOC) operates according to a specific algorithm that covers every organizational aspect of the mission. Among the checkpoints, it is important to give a great attention to the location where the mission will be carried out: it is essential to have a reliable partner in the area, which can be an NGO or a non-profit organization deeply rooted in the territory; This dialogue allows us to know the social and political stability of the country where we will carry out the mission. At this stage we will choose the place to stay for the team and for the vehicles, we must also know what type of patients will be entrusted to our care and what kind of treatments are those most needed. Information about the climate expected in the mission area, the availability of edible food or potable water, the presence of mains electricity, and health information such as recommended vaccines and any endemic diseases which take extra care, are particularly useful to know to arrange the necessary adjustments by individual participants in the mission.

Based on the number of patients we expected, we plan

the number of operators required: the required professionals are physicians-dentists, dental hygienists, dental assistants, at least 2 technicians for emergencies relating to the equipment in the field hospital, an attendant to the registration of patients, one involved in the computerized cataloging of the data, one store operator, a manager of executive processes, and a medical director. In order to optimize the timing, you have to follow the protocols operating in any clinical activity: IOC has based its activities on the protocols improved dental Calabrodental at the cutting edge dental clinic, of the Marrelli Group. Thanks to these protocols, operators have worked methodically and with predictability, reaching an average of 18 patients per day, about 1.8 patients per hour of activity; with this premise, it was possible to refine the computation of the number of doctors needed, on the basis of supposed patients. The presence of a check-point computerized, it allows us the indexing of patients with multiple variables: this allows us to carry out, at the end of the mission, an accurate picture of the activities that were performed, and to identify the best-performers, but also to check the points to be improved. In addition, a figure employed to stock management allows you to keep under control the materials used, in order to avoid unnecessary costs, but also to optimize the supply of material to be used in the following missions. The presence of a General Manager and a Medical Director is functional to the management of human resources divided into the medical, technical and administrative branches.

The operational workflow

The operational workflow is the "circulatory system" of the field hospital prepared during the missions of the IOC: it has been perfected during the years of activities in humanitarian missions; therefore, it represents a combination of expertise and experience that could be useful in future dental missions of other volunteers (*Figure 5*).

The beginning of each activity is the stage of reception: this stage should be managed in collaboration with the partners on the territory there must always be one or more of the local language interpreters, and it is necessary to accommodate patients in those areas in charge for the reception, in order to avoid a difficult management of the flows of patients. In the acceptance phase, instead, the patient demographic data will be collected and will be given a code that will accompany the patient throughout the entire process of treatment. In this stage the patients will be assigned to the clinician that will

perform him the first visit. The following stage of anamnesis involves the clinical diagnosis of the patient; therefore, at this stage you can specify the active diseases, the possible urgencies; and what are the diseases that will be treated during the mission. Of course, not all the pathologies can have a therapeutic procedure in the short period of a humanitarian mission: a prosthetic treatment, for example, is hardly feasible, given that the time of realization of a prosthetic rehabilitation is notoriously extensive. The goal of the humanitarian mission is to intercept and treat acute diseases in evolution; however, also the prevention must be done with the utmost professionalism and competence. After the stage of anamnesis, the patient is moved in the X-Ray area, located in Dental-Ambulance: this step is not mandatory, however, it allows us to have a more specific diagnosis, and therefore, more reliable. From this location, the patient is assigned to a medical practitioner within the Dental-Marquee: here he will be treated with the highest standards of quality, as required by the IOC protocols and by Calabrodental procedures. At the end of the treatment, the patient may have other treatments to be carried out, therefore, there is a "In-Transit" area, where the patient is not returned to his family, but he remains available to physicians. If, instead, the patient has completed his treatment, he is accompanied at the "Discharge and Database" area, where his output data will be recorded, where informative forms will be signed and where, finally, patient's informations will be archived in the general database. All the collected data are divided according to different variables: age, sex, race, systemic diseases, special needs, dental disease, type of treatment performed, presence / absence of complications, need for any follow-up, the operator who carried out the medical performance. All this information is stored both on paper medical records, both in the computer database designed specifically to document the flow of patients handled during the mission. When we discharge the children, we also deliver some nice gadgets, including toothbrushes and other oral hygiene products. In parallel with the clinical activities, IOC work-flow also includes preclinical activities, such as the need to have a flow of materials incoming from the area called "Storage Area", and the need to have a flow of instruments outbound to the area called "Sterilization area" which is located in the "Dental-Roulotte".

Results and Discussion

IOC has just 4 years of activity on the field, but it can take advantage of 30 years of experience in the dental field of Marrelli Group: this expertise has quickly produced a know-how that has increased the quality of the missions in few times.

By analyzing the first mission in 2011, compared to the last in 2013, we can notice an increase of treated patients, certainly consequential to the increase of operators on the field, but also due to the optimization of internal processes and the improvement of organizational structures; in fact, we may notice a significant increase in the performance carried out on patients, compared with the moderate increase in the number of patients themselves (*Table 1*). This means that it has increased the speed of the therapeutic process, in order to allow more treatments on individual patient at the same



Figure 5. A graphic representation of the workflow standardized in the IOC missions.

time. Other authors have described their results in this field, suggesting their own organizational models, however they were limited to describe their approach with regard to health management [3], or to the technical management [4] of the mission; the quality expressed by our model of humanitarian dental mission is based on its uniqueness in considering all the variables in this type of social activities.

A point of interest is related to the typology of treatments performed: the largest shares were treatments of oral hygiene and conservative therapies (*Figure 6*); these outcomes are easily explained: in fact, other treatments would be less possible in the exiguous time of a mission. Moreover, it should be emphasized that the "non-surgical" techniques were preferred with respect to the "surgical" techniques for the treatment of dental diseases; even this information can be interpreted on the basis of the fact that surgical procedures require specific skills [5], controlled environments, and often require a period of follow-up, therefore it is advisable to resort to surgery only in the most urgent cases. Finally, the treatments of oral hygiene have had an impact on the knowledge of the methods to better prevent the dental and periodontal diseases in the treated patients, mostly represented by children and adolescents.

Conclusions

IOC has achieved in recent years an organization optimized and highly predictable: this makes it a model for humanitarian missions in the field of dentistry, a model that could be adopted also by international NGOs operating in war zones, or in the major natural disasters. Oral health is a right that cannot depend on the place where one is born: smiling is a

Criteria	2011	2012	2013
Operators	22	24	32
Treated Patients	410	580	810
Operating Dental Units	4	6	6
Days	6	6	6
Performances	485	890	2015

Table 1. Table comparing the last 3 missions by I.O.C.

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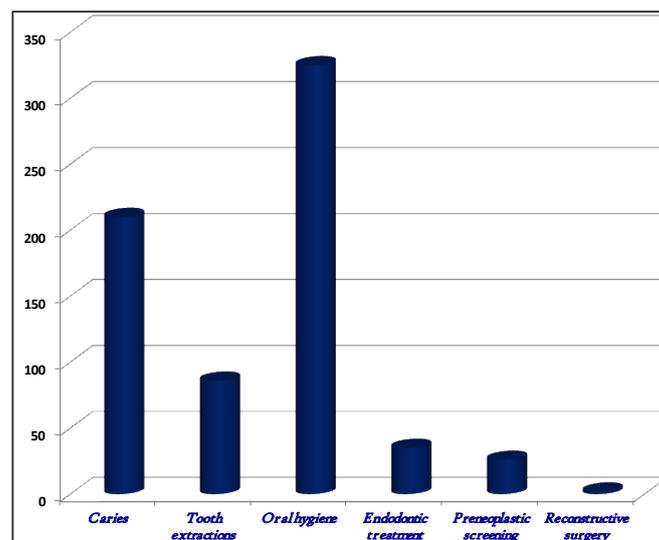


Figure 6. Distribution of the oral diseases treated during the last I.O.C. mission.

right for all, and must be a mission for all the operators in dental field.

Conflict of Interest

The authors declare that they have no competing interests

Authors' Contributions

MM: Has ideated the operative workflow and participated to all the missions

VP: Has taken the pictures here reported and participated to all the missions

DM: Has carried out the tables and part of the conclusions and participated to all the missions

MT: Has drafted the manuscript and participated to all the missions

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