Ramallah, Palestine

Start-up of the first Hematopoietic Stem Cell Transplant Unit

Istishari Arab Hospital

Introduction

Hematopoietic cell transplantation (HCT) is curative for many diseases including hematologic malignancies, bone marrow failure syndromes, primary immunodeficiencies, genetic conditions, hemoglobinopathies and autoimmune diseases. Due to its curative potential and advances in supportive care, the mortality of allogeneic transplants has decreased considerably over the past few decades; therefore HCT activity continues to increase exponentially worldwide. However, human development index and gross national income per-capita are observed to have associations with HCT activity globally. While HCT is potentially curative for many diseases, it is an intensive resource requiring treatment modality which requires adequate capital for start-up costs, and both HCT experts and governmental organizations are looking for guidance for essentials for a new HCT program which can be tailored according to the needs of their countries. An HCT program can be established at a reduced cost in a middle income country given the financial restraints, but it should have minimum quality standards which should ensure good ethical business principles, as well as have a keen focus on patient safety and a vision of long term sustainability. For controlling costs of a specialized healthcare program, it is necessary to firstly focus on minimal requirements for adequate and sustainable functioning of the program. The requirements have different levels of priority as recommended by the Worldwide Network for Blood and Marrow Transplantation (WBMT). A twinning program with an international expert HCT team or program is essential for a correct planning of the start-up of a HSCTU.

Establishing comprehensive Hematopoietic Stem Cell Transplantation (HSCT) services within Palestine represents far more than a new medical department; it embodies a revolutionary vision for Palestinian healthcare. This vision promises to directly address a life-threatening gap in national healthcare infrastructure, alleviating immense suffering and preventable loss. This initiative promises to deliver world-class, life-saving care within communities, empower the healthcare system, retain our medical talent, and foster national resilience.

Overview

The Urgent Imperative: Confronting the Cancer Crisis and Treatment Barriers

Cancer poses a devastating and escalating challenge in Palestine, with over 5,200 new cases registered annually. For patients requiring complex, life-saving procedures like HSCT – often the last therapeutic option for leukemias, lymphomas, myeloma, and severe non-oncological blood disorders – the barriers are particularly formidable. Critically, no dedicated HSCT unit currently exists within the West Bank or Gaza Strip capable of providing complete services. This absence forces patients into an agonizing dilemma. The current reality involves an expensive, lengthy, and profoundly complicated referral process to neighboring countries, primarily Jordan or Israel. The consequences of this system are catastrophic. The financial burden alone – encompassing treatment costs, international travel, accommodation, and prolonged stays abroad – is overwhelming, frequently leading families into bankruptcy or forcing them to forego treatment entirely. Logistical barriers compound the suffering: critically ill patients and their families must navigate the arduous process of obtaining permits, deciphering foreign healthcare systems, and enduring grueling travel. Movement restrictions, including unpredictable permit denials, checkpoint closures, and delays, directly jeopardize the strict treatment timelines essential for HSCT success, turning uncertainty into a matter of life and death. The human toll on families is immense, often leading to disintegration as caregivers are uprooted from jobs and other children, thrust into distant and unfamiliar environments, amplifying emotional and financial distress. This stark reality confirms that the lack of local HSCT capacity is a significant, preventable contributor to suffering and mortality among Palestinian cancer patients.

Transformative Impact: Building Resilience Beyond the Individual

Establishing an HSCT Unit transcends the creation of a new medical facility; it signifies a fundamental investment in resilience, capacity, and hope for the entire Palestinian healthcare system and society.

For patients and their families, the impact would be profound and immediate. It promises timely, life-saving care, eliminating dangerous delays by providing potentially curative treatment within their own community. This accessibility directly translates to improved survival rates and quality of life, fostered by prompt intervention and the crucial continuity of care within their existing support network. The immense physical and emotional burden of arduous travel while immunocompromised, coupled with navigating treatment in a foreign land, would vanish, replaced by the comfort of a familiar linguistic and cultural environment. Catastrophic financial costs associated with treatment abroad – travel, accommodation, and lost income – would be eradicated. Critically, family unity and support could be maintained, allowing families to stay together, preserve routines, and provide essential emotional strength at home,

significantly reducing the profound psychological trauma inherent in navigating foreign systems and enduring separation.

For the Palestinian healthcare system and its workforce, the benefits are equally transformative. The unit will catalyze specialized skills development, creating highly skilled local jobs for hematologists, transplant nurses, apheresis technicians, and coordinators, thereby retaining vital Palestinian medical talent within the country. The national referral system will be significantly strengthened, enhancing capacity for comprehensive cancer care within Palestine and reducing reliance on external, often inaccessible, systems. This initiative represents a major stride towards healthcare self-sufficiency and the realization of the right to comprehensive, world-class care within our borders. Furthermore, it will reduce the substantial financial drain caused by referrals abroad, keeping significant healthcare expenditures within the local economy.

Partnerships

SOLETERRE ETS:

Soleterre ETS is a non-profit foundation and a non-governmental organization (NGO) recognized by the Italian Agency for Development Cooperation (AICS) under the Ministry of Foreign Affairs and International Cooperation (MAECI). It works to uphold and implement the Right to Health in its broadest sense. To this end, in addition to providing medical care and assistance, Soleterre is committed to safeguarding and promoting the psycho-physical well-being of all individuals, both individually and collectively, at every age and in every part of the world. In order to guarantee the inalienable right to health, the Soleterre Foundation carries out projects that support existing healthcare facilities and medical personnel or, where these are completely absent, creates healthcare structures that meet the needs of the population.

Since 2010, Soleterre has launched the **International Pediatric Oncology Program "Fighting Cancer with Strength"**, aimed at developing prevention and early diagnosis and at reducing the level of suffering of children with cancer and their families. Today, the Program connects and fosters the sharing of scientific research and clinical practice among 20 healthcare facilities in Italy, Ukraine, Palestine, Côte d'Ivoire, Morocco, Burkina Faso, and Uganda.

ISTISHARI ARAB HOSPITAL:

As a premier tertiary care facility, Istishari Arab Hospital is a JCI-accredited hospital with over 300 beds, recognized for delivering advanced medical and surgical care across numerous specialties. There is a dedicated Oncology Department, staffed by experienced medical, radiation, and nuclear oncologists, hematologists, specialized oncology nurses, and pharmacists, providing the essential foundation and natural patient referral pathway for an integrated HSCT program.

Moreover are already present Intensive Care Units, comprehensive Advanced Laboratory Services (encompassing genetic testing, pathology, and HLA typing capabilities), modern Radiology & Imaging (CT, MRI, PET-CT), sophisticated Operating Theaters, and rigorously enforced Robust Infection Prevention & Control protocols – all critical elements for safe and effective HSCT. Istishari has a demonstrated commitment to excellence, with a proven history of successfully implementing and maintaining complex tertiary services while upholding the highest quality standards, continuously pursuing improvement, and investing in cutting-edge technology.

Strategically located in Ramallah, the administrative heart of the West Bank, it offer excellent accessibility to a large population base and serve as a natural referral hub for patients from across Palestinian regions. Finally, the deep commitment to academic training and education ensures the HSCT unit will not only provide life-saving care but also become a vital institution for training future generations of specialized Palestinian healthcare professionals, embedding this critical expertise within the nation for the long term.

Methodology

The project design is based on the capacity building model which aims to strengthen the already existing resources (both material and professional) in order to enhance competencies and skills of health care professionals who can guarantee better clinical outcomes and quality of care. The main goal is to empower the partner country, promoting scientific excellence. The project will be totally English based in training, reporting, meetings and clinical recording.
The capacity building methodology is mainly focused on training, even on the job and by remote assistance, which constitutes the base of empowerment together with:

- Seminars and teleconferences
- Creation of a protocol handbook with all Standard Operative Procedures
- Definition of a responsibility tree and path to transplant with defined rules and competencies between services
- Staggered approach in clinical activity starting from high curable diseases and easier procedure going to more intensive ones
- Definition of a daily, weekly and monthly plan of clinical and scientific meetings for all the personnel

For a complex activity as hematopoietic stem cell transplant is essential to have a strong partnership with local authorities and a good connection with other hospitals in the country for a referral system of patients. Moreover different specialities are essential to make the path to transplant possible: laboratory, pharmacy, blood bank system must be included in the process.
In respect to clinical activity we intend to apply a staggered approach, starting from high curable disease to more difficult ones.
Clinical teaching and supervision will be guaranteed mainly through training on the job and by remote assistance but also through dedicated training outside the country will be planned based on local needs.

Skills achievement

The definition of role, competencies and responsibilities of medical doctors and nurses in this specific and complex clinical setting will outline dedicated core curricula. This will formally identify them as experts and their academic and institutional centers will become a referral point in the region. This will contribute in strengthening the role of the hospital team as competent authority in enhancing regional research and treatment capacity in the field of hemato-oncology, thus supporting development in society and providing an ideal platform for sharing clinical cases and discussions, increasing problem solving skills and coordinating international clinical and research projects.

Educational goals:

- Improving diagnosis and risk stratification of hemato-oncological diseases through a better biological classification and flow cytometry evaluation of the status of the disease
- HSCT principles knowledge, through an educational and training program:
    1. INTRODUCTION: transplant indications in children, HLA system, donor choice
    2. IMMUNOLOGY: conditioning regimens, engraftment and immunological reconstitution after HSCT, acute and chronic GVHD
    3. COMPLICATIONS AND MANAGEMENT: early and late complications, monitoring of chimerism, post-HSCT follow-up, transfusional support, ABO incompatibility
    4. INFECTIONS: prophylaxis, bacterial, viral and fungal infections, fever in neutropenic patients
    5. HSCT IN DIFFERENT DISEASES: acute leukemias, haemoglobinopathies, malignant lymphomas, myelodysplastic syndromes, aplastic anemia
    6. NURSING BEST PRACTICE: blood component and stem cell infusion, chemotherapy, management of extravasation, oral care and mucositis, nursing support in acute and chronic GVHD, monitoring vitals and alarm signs, nursing the critically ill patient, vascular access care, infections control, isolation rules, caregivers educatioN
    7. HSCT STANDARDS: donor and recipient work-up, stem cell target, peripheral cell mobilization and collection, marrow harvest procedure
- Discussion and creation of dedicated treatment protocols and transplant indication process;
- Quality management and improvement of traceability process (clinical documentation, standard operating procedures).

Phase 1: Exploratory mission and Feasibility evaluation

16-24 May 2025: see mission report

Phase 2: The project

General objective	
Start-up of Hematopoietic Stem Cell Transplant Unit (HSCTU), which will be completely autonomous in 3 yrs.	
Specific objectives	**Activities**
1.Set up of a path to transplant and training of personnel	A1.1: Identification of the personnel to be trained, preparation of the program A1.2: Educational course A1.3: Protocols editing A1.4: Training on the job by the international medical team A1.5: Teleconference A1.6: Training for medical doctors on clinical activity A1.7: Definition of the HSCTU responsibility tree diagram and collaboration between services A1.8: Definition of the HSCT nurse job description and task analysis A1.9: European Blood and Marrow Transplant society partnership and subscription
2.Set up of a path for early and late follow up of transplanted patients and training of personnel	A2.1: Identification of the personnel to be trained, preparation of the program A2.2: Educational course A2.3: Protocols editing A2.4: Training on the job by the Italian medical team A2.5: Teleconference A2.6: Training for medical doctors on clinical activity A2.7: Training for 1 biologist on chimerism A2.8: Creation of an organized dedicated HSCT out-patient clinic A2.9: European Blood and Marrow Transplant society partnership and subscription
3.Set up the nurse's rules for patient management and monitoring	A3.1: Identification of the personnel to be trained, preparation of the program A3.2: Educational course A3.3: Protocols editing A3.4: Training on the job by the international nurses' team A3.5: Training for 4 nurses on clinical activity
4.Set up of a path for donor selection, HLA typing, stem cell collection, processing, and storage	A4.1: Identification of the personnel to be trained, preparation of the program A4.2: Educational course A4.3: Protocols editing A4.4: Training on the job by the Italian medical team A4.5: Teleconference A4.6: Training on the job on Processing Unit set-up A4.7: Training on apheresis and product manipulation A4.8: Training on apheresis and product manipulation A4.9: Training on HLA A4.10: Training on CD34 count A4.11: European Blood and Marrow Transplant society partnership and subscription
5.Optimization of the route for diagnosis and treatment of hemato-oncological diseases	A5.1: Identification of the personnel to be trained, preparation of the program A5.2: Educational course A5.3: Protocols editing A5.4: Training on the job by the international medical team A5.5: Teleconference A5.6: Training on cytofluorometry A5.7: Training on minimal residual disease

Evaluation			
	Output	**Outcome**	**Impact**
Measured indicators	1) Selected nurses, doctors and technicians have been successfully trained by the end of the project 2) Complete protocol handbook has been written by the end of the project	1) At least 30% of eligible patients undergo to transplant on the first year, up to 80% on the third year of the project 2) 100% of suitable donors are selected and undergo to donation with less than 1% of severe complications	1) Improvement of the prognosis of patients with hemato-oncological disease in comparison local baseline data 2) Achievement of a transplant related mortality < 20% 3) The hospital is autonomous in all aspects related to transplant

Training on the job

	MD	**RN**	**Technician Biologist**
Exploratory mission	1 week	1 week	1 week
Pediatric program	Continuous supervision for at least 2 month twice/yr for the first 2 yrs	Continuous supervision for at least 2 month twice/yr for the first 2 yrs	
Adult program	Continuous supervision for at least 2 month twice/yr for the first 2 yrs	Continuous supervision for at least 2 month twice/yr for the first 2 yrs	
Apheresis and product manipulation	Continuous supervision for at least 2 month twice/yr for the first yr		Continuous supervision for at least 2 month twice/yr for the first yr

Training abroad

FIELD	N°PERSONS	DESTINATION
Clinical training on adult HSCT	1 (1 month)	IRCCS San Gerardo dei Tintori or Ospedale Maggiore, Bologna, Italy
Clinical training on pediatric HSCT	1 (1 month)	IRCCS San Gerardo dei Tintori, Monza, Italy
Apheresis and product manipulation	2 (1 months)	Ospedale San Camillo, Roma
Training on flow cytometry and CD34 count	1 (1 months)	Hospital San Francesco, Nuoro, Italy
Clinical training of 2 nurses in adult hematology	2 (1 month)	IRCCS San Gerardo dei Tintori or Ospedale Maggiore, Bologna, Italy
Clinical training of 2 nurses in pediatric hematology	2 (1 month)	IRCCS San Gerardo dei Tintori
Training on minimal residual disease	1 (2 months)	King Hussein Hospital, Amman, Jordan
Training on HLA typing, HLA antibodies and chimerism	1 (1 month)	King Hussein Hospital, Amman, Jordan
Total number of persons involved	11	

Timelines

- February 2026: training in Italy
- May 2026: first HSCT educational course on site
- October 2026: start of clinical activity with on site supervision for the first transplants and online continuous supervision
- October 2026- October 2028: multiple onsite missions of the international staff
- From October 2028: remote supervision with possible missions onsite if needed

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