Lake Como School of Advanced Studies
School on Organ Transplantation June 26-28, 2019
Decision-Making in Transplantation: Frontiers of Medicine and Science

Programma definitivo

Decision Making in a Complex Biological System: Schedule

Day 1	Day 2	Day 3
Basics of Transplantation: History, Technical Aspects Organ Procurement and Allocation	**Transplantation: Immunology and Graft Rejection**	**Basics of Transplantation: Clinical Challenges and Ethics**
9.00-9.30 Welcome and Introduction to the school: Paolo Grossi & Jay Fishman	9,00 – 9,45 Basics of Immunology of Graft Rejection Emanuele Cozzi (Padova)	9,00 – 9,45 Special lecture: History and experience of a pioneer of Liver transplantation Luigi Rainiero Fassati (Milan)
9,30-10,00 Special lecture: Complexity and Chaos: Giulio Casati	9,45 – 10,30 Immunosuppression and Drug toxicity Umberto Maggiore (Parma)	9,45 – 10,30 Cultural sensitivity, ethics, and education Alessandra Grossi (Varese)
10,00-10,45 Organ-specific challenges in transplantation: Kidney and Liver Umberto Cillo (Padova)	10,30 – 11,15 Immunosuppression, Infectious Risk, Timeline of Post-Transplant Infections: viral, bacterial, fungal and parasitic Jay Fishman (Boston)	10,30 – 11,15 New Technologies for Therapy: Natural and Synthetic Immune Tissues, Nanotechnology Jonathan Bromberg (Maryland)
10,45 - 11,30 Coffee break	**11,15 – 11,45 Coffee break**	**11,15 – 11,45 Coffee break**
11,30 -12,15 Organ-specific challenges in	11,45- 12,30 Measuring Immunosuppression: Global Assays and	

transplantation: Heart and Lung Mauro Rinaldi (Torino)	Pathogen-specific assays (TB, CMV, Fungal) Patrizia Comoli, (Pavia) 12,30 – 13,00 Case #1 At present, multiple assays exist that measure various aspects of immune function – including specific assays (e.g., for cytomegalovirus) and general assays (innate and adaptive immune function). Optimal utilization of immune suppression depends on the clinicians'' assessment of immune requirements to maintain graft function. This case will examine graft rejection after kidney or heart transplantation, the risks of under immunosuppression (rejection) and over immunosuppression.	11,45 – 12,30 PTLD and malignancies in transplantation Franco Locatelli (Roma)
12,15 – 13,00 Organ-specific challenges in transplantation: Bowel and Multivisceral Transplantation Michele Colledan (Bergamo)		12,30 -13,15 Tolerance Induction Giuseppe Remuzzi (Bergamo)
13,00 – 14,30 Lunch	**13,00 – 14,30 Lunch**	**13,15 – 14,30 Lunch**
	14,30 -15,15 Donor-Screening, Donor-derived Infection and Increased Risk Donors: Paolo Grossi, Varese	14,30 15,15 The Microbiome in Transplantation Jay Fishman (Boston)
14,30 – 15,15 Organ preservation, repair, and transportation technologies Walter Hassanein (Boston)	15,15 – 16,00 HCV infection in solid organ transplant candidates and recipients Patrizia Burra (Padova)	15,15 – 15,45 Ethics: Informed consent – patient perspective? Mario Picozzi (Varese)
15,15 – 16,00 Organ Replacement technologies (ECMO, stem cells, artificial organs) Giuseppe Remuzzi (Bergamo)	16,00 – 16,45 Solid organ transplantation in HIV-infected individuals Jose Maria Miro (Barcellona)	15,45 – 16,15 **How do we analyze complex systems? What can be fixed?** **Fishman, Cozzi, Grossi**

	16,45 – 17,00 Ethics: Presumed Consent **David Paredes (Barcellona)**	16,15 – 17,00 Case #3 Fishman, Cozzi, Grossi Decision-making in Transplantation. The core aspect of this field is the balancing of various clinical requirements: urgency of clinical need, availability of organs, the quality of organs, the risks associated with various options, and issues including cultural sensitivity and the "best" recipient for each organ. Should we be offering organs from donors infected with HIV, hepatitis viruses, or at risk for transmitting various (unknown) infections? Which recipient should get an organ – one who is dying and critically ill or another who is likely to do better after surgery? Should all recipients be citizens of the countries where they are transplanted? Should we consider the cost of care?
16,00 – 16,15 Coffee break	**Coffee break**	**17,00 – 17,15 Closing remarks Paolo Grossi & Jay Fishman**
16,15 – 17,00 **Xenotransplantation: lecture and case presentation** **Jay Fishman (Boston)** **Emanuele Cozzi (Padova)** The case involves a patient with acute liver failure for whom no liver is immediately available. A pig-derived liver is available but raises many immunological, infectious disease and ethical concerns. Expert discussion will cover these topics and allow for group discussion.		

RAZIONALE SCIENTIFICO

The clinical team that carried out that first identical-twin transplantation in 1954 in Boston could not have anticipated the tremendous advances that have occurred in transplantation. Today, transplant clinicians have an armamentarium of immunosuppressive agents at their disposal, all of which are used in various combinations both for induction and maintenance immunosuppression. Loss of organs due to acute, irreversible rejection is now uncommon, and one-year graft-survival rates of 80 to 90 percent are the norm for all types of organ transplantation. Many problems remain to be solved — for example, the insidious loss of grafts from chronic allograft failure; complications associated with immunosuppressive drugs, Including nephrotoxicity, hypertension, hyperlipidemia, and diabetes; and with long-term immunosuppression, the increased incidence of infection and cancer. Furthermore, the gap between the number of organs available and the demand for organs increases every year, giving rise to serious ethical dilemmas of equity versus utility in the allocation of this increasingly valuable resource. These factors enter into the routine decisions that guide organ allocation and the care of critically ill patients.

Clinical transplantation is considered one of the medical miracles of the 20th century and remains an enormously exciting field. New scientific and ethical challenges emerge from areas such as xenotransplantation and use of organs from donors carrying HIV and HCV infection. However, such challenges and exciting scientific insights combine to make the field a dynamic work-in-progress. Some of the major achievements and disputes in this multidisciplinary clinical field will be the subject of this school which fits within the central theme of complexity.

Chaos vs. Complexity?

All donors and recipients of transplanted organs, organs, allocation systems and medical care vary greatly. These differences in initial conditions (even those which are small) produce widely diverging outcomes for such systems, **rendering long-term prediction or generalization impossible. Thus, decision-making in transplantation must account for numerous, individual biological factors – for which formal measurements may not exist. Physicians say the patient "looks sick." Pathologists opine "This is a good organ." These "expert" opinions are used to predict the outcomes of transplantation. Complexity** is generally used to characterize a process with many parts where those parts interact with each other in multiple ways. *The study of these complex linkages at various scales is the main goal of complex systems theory – and the exciting subject of this course.*

What is the path forward for clinical transplantation? Can the outcomes of transplantation be improved based on the initial conditions of donor, organs, and recipients? Or are outcomes dependent on unknown or unpredictable features, and completely unpredictable?

This course is dedicated to the identification of the variables in transplantation as well as the dramatic advances in immunosuppression, assessment of immune function, and future technologies that will affect clinical outcomes and drive research. It will target the leaders of tomorrow – the physicians, surgeons and scientists engaged in advancing the frontiers of transplant care.