1. Identification of the organisation

- Name of the organisation: ISMETT (Istituto Mediterraneo per i Trapianti e Terapie ad Alta Specializzazione) – UPMC Italy

- Name of the person in charge of the organization: Bruno Gridelli

- Email / phone/ website: bragonese@ismett.edu; ddonato@ismett.edu

- **Level**: regional

- **Sector**: healthcare

2. Short description:

- **Title of the case**: Involving stakeholders in process innovation: Home-monitoring patients discharged after liver transplantation, a pilot study
- **Keywords:** innovation; stakeholders involvement; staff involvement; use of innovative information technologies; efficiency; patients-oriented approach**;** use of TQM principles; monitoring; resources.
- **Summary:** ISMETT is a Transplant Centre situated in Palermo, Sicily. It is the only multiorgan (liver, heart, lung, and Kidney) transplant centre in Southern Italy. It also provides high specialty surgical and non-surgical procedures to the entire regional population (approximately 5 millions people living in the Sicilian Region). More than 1.200 patients have been transplanted at ISMETT in the last 10 years. Approximately, one third of them live in the Palermo area (about one millions of inhabitants), while two third of them live in the other areas of the Sicilian Region or outside Sicily. The distances between Palermo and other Sicilian cities vary from 100 to more than 250 Km. The state of road network and other communication route is not optimal and it represents a problem in maintaining a strict and continuous follow-up in the post-transplant period. Moreover, in the early post-transplant period, the need to maintain tight control of the clinical and laboratory results forces patients (still in not optimal conditions) to travel frequently. Health care system is funded by the Regional Government, which has been striving to reduce costs in the last decade.

  Following the use of CAF and of the self assessment framework in 2010-2011, the organization was stimulated to apply the PDCA cycle for all the CAF criteria and subcriteria, and benefitted from the external evaluation by the CAF team in April 2011. The good practice that was implemented is based on the 2.4 subcriteria related to the planning, implementation and review of modernization and innovation, and on the 4.5, 5.2 and 5.3 subcriteria related to managing technology, to the development of citizen/customer-oriented services and products, and to the involvement of citizen/customers. The project is also based on subcriteria 1.4 and 4.1 related to managing the relations with politicians and other stakeholders in order to ensure shared responsibility and to developing and implementing key partnership relations, in fact the project has been supported by a grant from the Regional Government.
  The goal of the project is to empower patients and their healthcare teams to better manage the post-operative phase after liver transplantation, and reduce patient's discomfort travelling to the hospital for follow up visits. To achieve this goal ISMETT implemented an innovative cost effective remote patient management tool. The pilot started in July 2011 and is running for 18 months across the Sicilian Region and will include 70 more patients for a total of 100 patients by January 2013. As for March 2012, the electronic web based device has been installed in the homes of 30 liver transplant recipients consecutively discharged after surgery, with further devices placed within the hospital and accessed by physicians, transplant coordinator nurses and other personnel responsible for working with patients in the community. The device allows patients to measure their vital signs such as blood pressure, pulse, blood oxygen saturation and weight. Patients can also interact with healthcare teams; respond to questions about their condition posed remotely by hospital specialists over a video conferencing feature, reproducing a real outpatient clinic visit. All of the data can be reviewed remotely by the hospital personnel and can help give insight into whether a patient's condition is worsening and whether they need to come to the hospital.
  Within the Plan-Do-Check-Act Improvement Cycle, we are in the preliminary Check phase on 30 patients already enrolled. The overall aim of the pilot, which will include 100 patients by January 2013, is to identify changes in symptoms and to respond effectively, and thereby reduce the need for readmission to hospital. We have conducted data analysis and surveys on patient satisfaction with this newly introduced tool. The primary end-point is the number of hospital readmissions within 3 months post transplant. Secondary measures include a) length of stay for the transplant admission, b) patient preference. Data of the study population are compared with historical controls (patients transplanted in our Centre before July 2011 and followed-up with traditional method of recurrent out-patient clinic visits and contact by

phone in case of urgency). Preliminary results on the 30 patients already enrolled in the pilot are reported in Table1.

	In Home-monitoring	Control (historical)
Patients included (as per March 1st, 2012)	30	
Patients evaluated (> 3 months of f-up)	30	30
Average lenght of stay (ALOS) days	17.9	27.8
Patients readmitted within 3 months post-transplant	0	3
Readmissions within 3 months post-transplant	0	2
Overall lenght of stay due to urgent readmissions	0	34
Patient/family satisfaction with home monitoring compared to traditional follow up visit (score 1-5)	>90% score 4-5	N.A.

Table 1

In conclusion, the preliminary results confirm that this innovative methodology to follow up on post liver transplants patients is supporting a reduction of urgent readmission to the hospital, a decrease of patient's hospitalization period with a reduction of costs for the hospital and thus for the Region of Sicily that funds healthcare system, and an increased satisfaction for patients and their families.

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Session 3.3a

"*Home-monitoring*": How to deliver high-specialty care at Home after Liver Transplantation: a sustainable approach

Ioannis Petridis, Hepatology Unit, ISMETT-UPMC, Palermo- Italy

Agenda

- **The Multiorgan transplant center in Palermo (Italy)**
- **The challenge**
- **Implementation of CAF and PDCA cycle**
- **The innovation: a technological solution**
- **Sustainability and Results**

Istituto Mediterraneo per i Trapianti e le Alte Specialità

- ISMETT is a Transplant Centre situated in Palermo, Sicily. It is the only multiorgan (liver, heart, lung, and Kidney) transplant centre in Southern Italy.
- We provide high specialty surgical and non-surgical procedures to the entire regional population (approximately 5 million people living in the Sicilian Region).
- More than 1.200 patients have had transplants at ISMETT in the last 10 years.

Our Patients

- Approximately one third of patients live in the city area (about one million inhabitants), while two third of them live in other areas of the Sicilian Region or outside Sicily. The distances between Palermo and other Sicilian cities vary from 100 to more than 250 Km.
- The state of the road network and other communication routes is not optimal and it represents a problem in maintaining a strict and continuous follow-up in the post-transplant period.
- In the early post-transplant period, the need to maintain tight control of the clinical and laboratory results forces patients (still in not optimal conditions) to travel frequently. Health care system is funded by the Regional Government, which has been striving to reduce costs in the last decade.

The challenges

- Progressive increase of liver transplant recipients.
- Need for rigid clinical surveillance (expecially in the early post-operative period)
- Patients' area of origin
- Difficulties associated with frequent travel (from home to the Transplant Center and back) for outpatient visits

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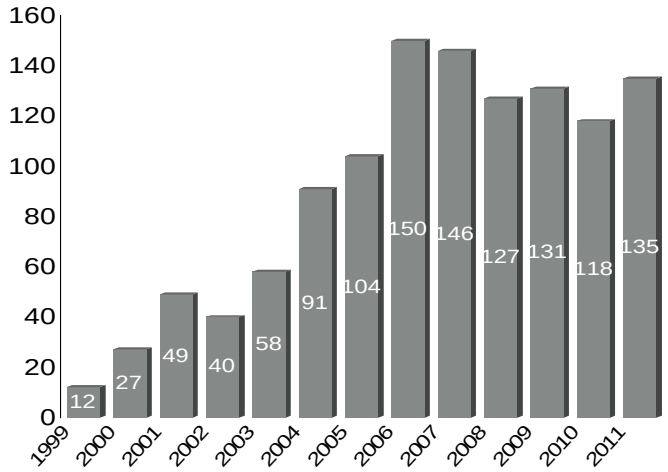
Solid organ transplantation at ISMETT (July 1999-April 2012)



Total

1245 Transplants

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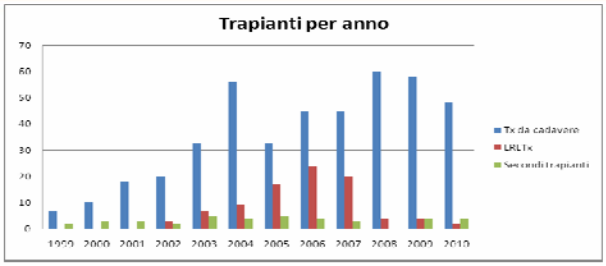
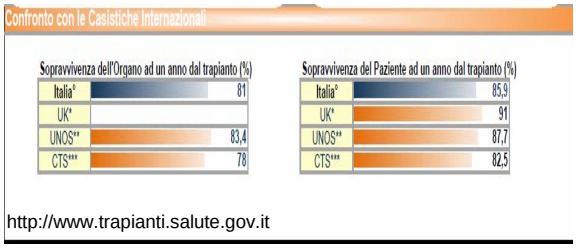
Liver transplantation at ISMETT



Overall 764 liver transplants (as of 11/5/2012)

101 from living donors



http://www.trapianti.salute.gov.it

5-y patient survival

~ 80%

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Liver transplant recipients in follow-up at ISMETT (as per April 15, 2012)

City	Transplanted in other Centers	Transplanted at ISMETT	Total
PA	112	186	298
AG	27	32	59
CL	8	24	32
CT	12	62	74
EN	5	11	16
ME	12	35	47
RG	2	22	24
SR	9	31	40
TP	22	26	48
Out of the Region	8	53	61
TOTAL			699

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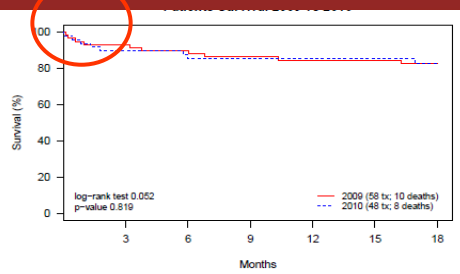
What we usually do in the early post-operative course



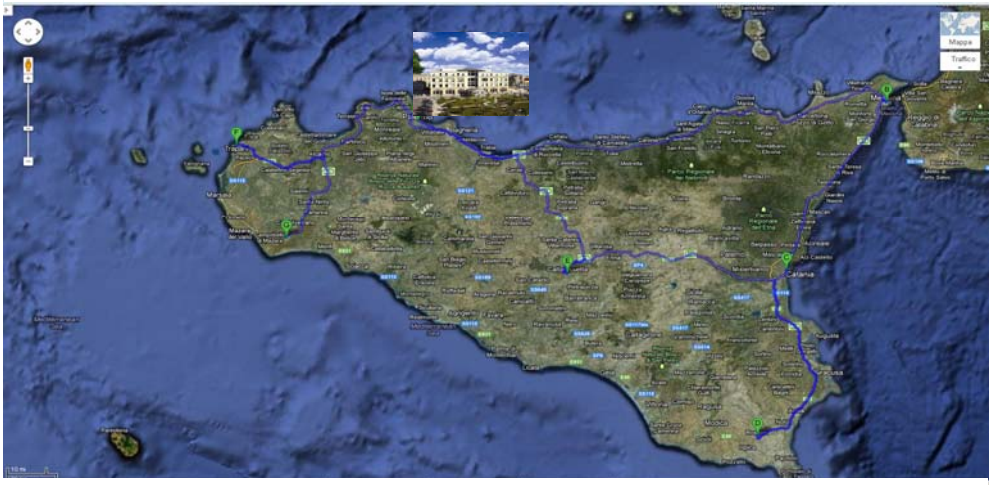
The early post-transplant period is crucial due to:

- High risk of rejection
- High risk of infections
- High risk of drug toxicity

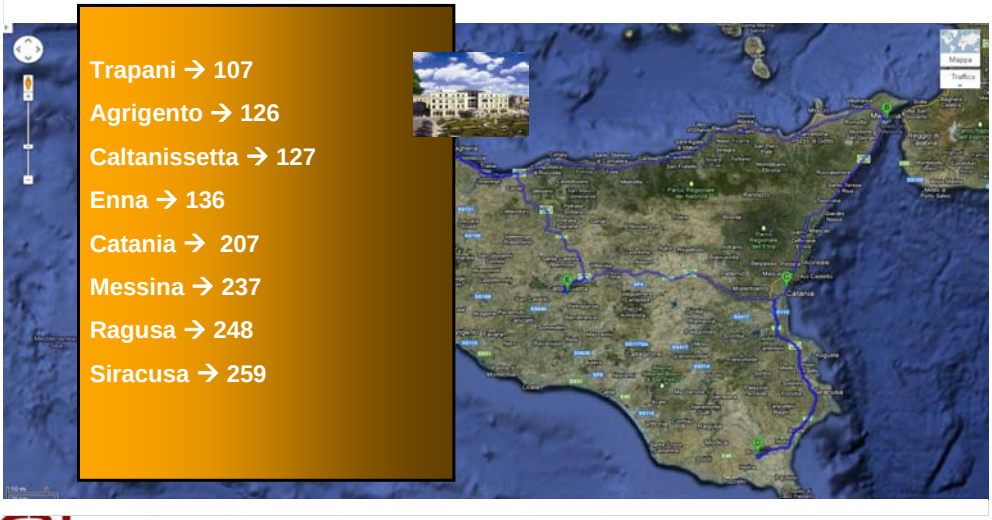
The rigid clinical surveillance is mandatory, in order to obtain:

- early diagnosis of clinical complications
- correct dosage of immunosuppressive medications
- best compliance with therapy

For these reasons, the usual approach of the Transplant Centers is to force patients to stay in hospital for a long time after transplant or in residences near the hospital.



Distance (Km) between the ISMETT venue (Palermo) and the major sicilian cities



Implementation of CAF and PDCA cycle

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Post liver transplant "Home-monitoring".

- Recognising the challenges we face, we teamed-up with Intel-GE Care InnovationsTM to design a study using its tele-health technology with the aims of speeding up hospital discharge of post-liver transplant patients and enabling uninterrupted recovery at home, while maintaining close contact with our medical teams.

- The technology allows nurses and physicians to monitor and support transplant patients from their homes, with the ability to check their general condition, collect biometric data, manage their treatment and offer face to face appointments via video conferencing. Most importantly it enables patients to rest in their own environment

Main functionalities:

Monitoring of vitals signs

Tele-visit (by Videoconference patient home-ISMETT) performed by our specialists

Educational support for patient/family

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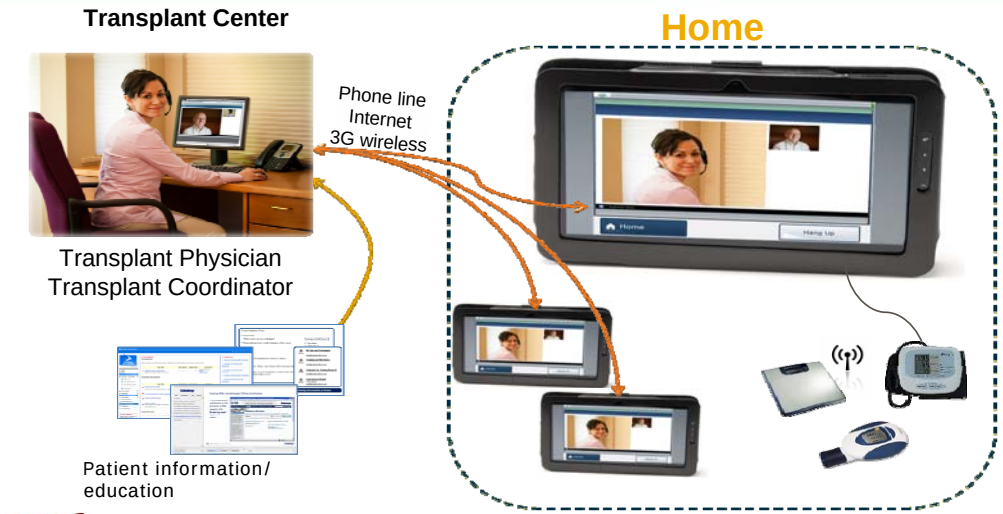
Post liver transplant "Home-monitoring".



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Post liver transplant "Home-monitoring".

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Post liver transplant "Home-monitoring".

- **Inclusion criteria:**
  All consecutive patients who live in Sicily, who received liver transplantation at ISMETT and were discharged from July 15, 2011.
- **Staff involved:**
  At the patient's home:
  technician for the instalment of the devices
  In Tele-Visit (tele-consult):
  Physician (ISMETT-UPMC)
  Transplant coordinator (ISMETT)
  Other (physiotherapist-psycologist)

Clinical pathway:

- Clinical monitoring during the post-discharge time (first 3 months or until clinical stabilization)
- Verification of the adherence to therapy (immunosuppression, other medications)
- Verification of the adherence to the bio-humoral surveillance after transplant

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Post liver transplant "Home-monitoring".

INDICATORS	In Home-monitoring	Control (historic)
Patients included (until 31.5.2011)	**36**	**NA**
Patients in the analysis (> 3 months of f-up)	**34**	**32**
Average length of stay (days)	**20.3**	**27.8**
Patients who needed urgent re-admission during the first 3 months after transplant	**0**	**3**
Overall number of urgent re-admissions during the first 3 months after transplant	**0**	**4**
Overall length of stay due to urgent re-admissions during the first 3 months after transplant (days)	**0**	**25**
Patient/family satisfaction rate (based on questionnaire administered)	**98%**	**NA**

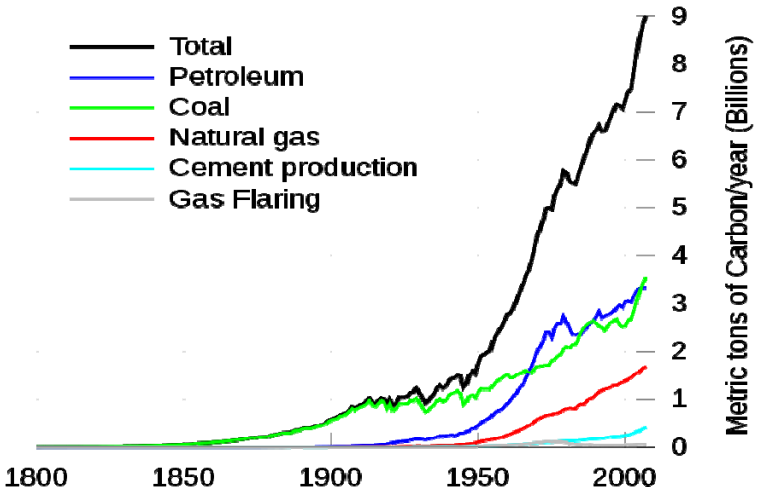
Environmental impact of "Home-monitoring".

Telehealth Benefits and Adoption: Connecting People and Providers Across Canada was commissioned by:

Canada Health Infoway — Inforoute Santé du Canada

- **Canadian study published in May 2011**
  - In 2010 about 94.000 medical consults performed with patients residing in rural areas
  - Estimated cost saving:
    - 47 million Kilometers of travel (for an average of 500 Km/consult)
    - 70 million $ of personal travel costs
    - 5.6 million liters of fuel
    - 13 million Kg of CO_2 emission

Post liver transplant "Home-monitoring". Environmental impact



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Follow-up of liver transplant recipients: a "sustainable" approach

A possible solution to the challenges we face: home-monitoring/tele-consult

Sustainability	
Social	To guarantee that precious resourses used for the care are used appropriately = Best standard of care for patients
Economic	Rational use of high-cost resources (hospital beds/OPC visits by specialists). Reduction of unnecessary assistance-related costs (i.e. work-days of family members)
Environmental	Reduction of the impact to the enviroment (i.e. reduction of fuel consumption for travel and related CO2 production)

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THANK YOU FOR YOUR ATTENTION

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