



CLERAD
LA MAÎTRISE DES RAYONNEMENTS

GAMMA PROBE ACTIVITY MONITORING

Gamma-AM

**Real time monitoring and continuous control of
the radioactive product leak rate towards the
general circulation of the patient**

Clinical Applications : Limb sarcomas or melanomas

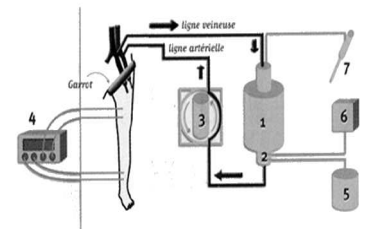
Used for the treatment of upper and lower limb sarcoma.

Treatment of limb sarcoma with the ILP method

Isolated Limb Perfusion (ILP):

This technique allows to isolate with a tourniquet, one limb (upper or lower) from the rest of the body in order to inject into the tumor area a dosis of drugs (TNF+ Melphalan) 10 times superior than a systemic chemotherapy. This injection is done through an extracorporeal circulation.(scheme1).

This high drugs concentration works on the tumor and permits to reduce its size or permits to provoke a tumor necrosis. This allows to avoid amputation or mutilating. However the $TNF\alpha$ is extremely toxic. The patient life is at stake in case of leak from the extracorporeal circulation to the the general circulation. This is why, it is necessary to use a survey device for this method:



1) Réservoir de CEC - 2) Échangeur thermique et oxygénateur
3) Pompe de CEC - 4) Téléthermomètre - 5) Source de dioxygène
6) Bloc thermique - 7) Site injection et prélèvement



CE 0459
Class II B



Made in France
ISO 13485

Intraoperative probe interest :

The probe is **connected to a computer** with a specific and **adaptated software**, and is installed near the heart (precordial situation). At the beginning of the operation a small amount of albumine radiolabelled with $99mTc$ is injected into the extracorporeal circulation to determine the critical level. A Highest radiolabelled dosis is then injected into the Extracorporeal circulation..

The probe analyses the leak rate of the radioactive product which allows to launch an alarm if the rate is higher than the predetermined critical level.

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ISO 13485
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MED**

Setting the ILP (or PHIM) technique in an Hospital

Concerned staff :

- Oncologist
- Surgeon
- Anatomopathologist
- Anaesthetist
- Nuclear physicist
- Extracorporeal circulation pump attendant
- Pharmacist

Equipment needed :

- Hyperthermic perfusion system
- Performer HT, Rand (1)
+single-use items
- Leak monitoring system:
Gamma-AM, CLERAD (2)



1



2

Training and et needed agreements :

- Agreement to use the drug TNF α :
BEROMUN®, Tasonermine
(cytokineTNF alfa-1a)

Medical laboratory Boehringer
Ingelheim, Medical Information,
Reims- France

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- Mastering Extracorporeal
circulation activity

Regulation and signals :

- Create a radioprotection file for
the theatre
- Put up this signal on the
theatre's front door

