

# Peritoneal Carcinosis

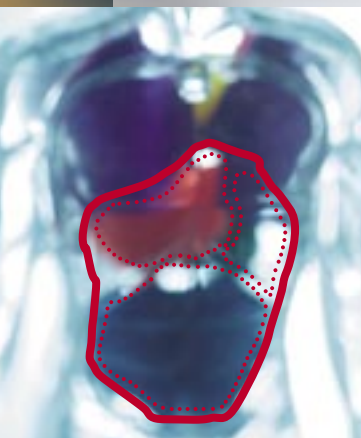
The background features a vertical gradient from light blue at the top to yellow at the bottom. A thick, white, wavy path starts at the top right and curves down towards the bottom right. Scattered along this path and in the surrounding space are numerous semi-transparent circles in shades of blue and yellow, some appearing to glow or have a soft shadow.

What is it and  
how to cure it

# Peritoneum

**Peritoneum** is a thin and transparent membrane that covers the internal part of the abdominal and pelvic cavity and all the viscera contained in it (liver, spleen, bowel, uterus and ovaries).

This membrane is composed of two layers: one covering the internal face of the abdominal cavity's wall (called parietal); the other covering the internal organs fixing them to the abdominal walls (visceral). Between these two peritoneal



layers there is a space called peritoneal cavity. In this cavity there is a fluid that acts as a lubricant, allowing these two layers to slide one to the other, simplifying the active and passive movements of the abdominal organs.

## How does the Peritoneal Carcinosis originate

**Peritoneal Carcinosis** represents the advanced evolutive stage of several tumors that develop into abdominal organs, such as colon, ovary, appendix, stomach, pancreas and liver. Furthermore, there are also tumors, even though fortunately rare, that develop directly from peritoneum (**mesothelioma**).

Peritoneal Mesotelioma is a rare tumor, whose incidence is of 2 cases per million inhabitants / year and represents about the 10-20% of 2,200 new cases of mesothelioma registered every year in the United States. Its incidence is increasing and it is strictly linked to asbestos exposure.

All the abdominal and pelvic organs can be affected by a tumor and the most common are the colorectal, the stomach and the ovary cancer.

**COLORECTAL CANCER** is the second more incident tumor over the whole population, with a 47.7 rate over 100,000 men and 36.2 rate over 100,000 women. This tumor is constantly increasing in the last years, especially because of the persisting of wrong life styles, nutrition in particular.

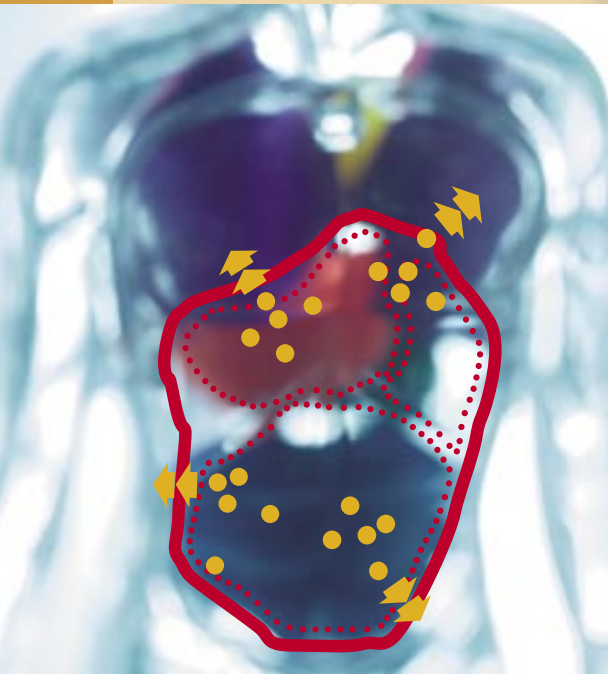
Even **STOMACH CANCER** is strongly linked to the diet style, especially it seems that the risk increases in those people who eat large quantity of conserved food and few fruits and vegetables.

The principal risk factor for **OVARY TUMOR** is, on the other hand, familiarity, cause of the 5-10% of the total. Women whose first grade relative (mother, sister or daughter) is affected by ovaric carcinoma, have a higher risk to develop this neoplasia.

When the disease increases, the tumoral cells reach and affect the membrane covering the same organs (visceral peritoneum).

Once this “barrier” has been passed, the affected cells are able to move into the abdominal cavity, carried by the peritoneal fluid. Even in mesothelioma cases, that affect directly the peritoneum, tumoral cells can break off the membrane and fall into the peritoneal fluid.

The tumoral cells present into the liquid can die or survive feeding on substances contained in the same liquid. These cells tend to accumulate in those points of greater liquid reabsorption, creating agglomerates that grow more and more, spreading into the whole abdomen and originating the carcinosis.



# How to cure the Peritoneal Carcinosis

For long time **Peritoneal Carcinosis** has been considered a pathology not curable surgically and not very responsive to chemotherapy. Given to the peculiarity of this kind of tumor, until a few years ago it has been considered impossible to act surgically and the recovery perspectives have been considered void.

Another obstacle to treatments seemed to be given by the tendency that some drugs show to concentrate at peritoneum level passing through it only gradually. The peritoneum is the most common place of relapse after interventions called curative of removal of abdominal tumor.

**Today it is possible to cure these tumors thanks to the combined intervention of surgery and chemohyperthermia**

The evolution of techniques and the availability of therapeutical aids and innovative methods in surgical pharmacological field, allow, today, to treat even this kind of neoplasia in an effective way. The best approach possible today contemplates the **combination between surgery and intraperitoneal chemohyperthermia**, a complex intervention organized into two stages: first the surgical removal of the tumoral tissue, then a “washing” of the abdominal cavity with chemotherapeutic drugs at high concentrations, in order to kill the free tumoral cells. Surgical intervention and chemohyperthermia are separate parts but equally important for the treatment’s good result.

In order to be really effective, they have

to be executed one immediately after the other: in fact, if it passes even only one week, the chemohyperthermia results ineffective because the free tumoral cells are “entrapped” in very short time into the cicatricial tissue where they are absorbed, hidden and protected.

## **Peritonectomy**

It is the intervention for the surgical removal of the tumor. It consists in the removal of the affected organ and the destruction, through the use of traditional or electrical at high power scalpel, of all the agglomerates of visible tumoral cells. It's a long and complex intervention that can last even up to 16 hours. The admission to hospital occurs one or two days before the operation. The pre-operating preparation includes a general objective exam, instrumental exams (thorax, abdomen, pelvis TAC, eventual PET total body and eventual stadiation laparoscopy) and ematochemical exams (tumoral markers etc...).The day before the intervention, the patient is prepared with a bowel “washing” and an anticoagulant therapy.



## **Intraperitoneal chemohyperthermia**

Once the tumor has been removed, what remains can be assaulted with **intraperitoneal chemohyperthermia**, whose purpose is the elimination of possible free tumoral cells into the abdomen. It is a particular type of chemotherapy exploiting the combined effects of heat and of drugs, that act locally on the interested zone. Intraperitoneal chemohyperthermia has proved to be particularly effective because it is able to get over that “barrier” that does not allow to chemotherapeutic drugs to act in the best way. This technique combines several effects linked on one side to high temperature, on the other side to the location of the intervention.

The high temperature has properties able to kill tumors, favours the entering into cells of some drugs and potentiates their efficacy. The localization of the intervention permits the exposure of the tumor to antitumoral drugs at high dosage, minimizing the general undesired effects. The dose could be hundred (sometimes thousand) times superior than the one utilized when given intravenously.

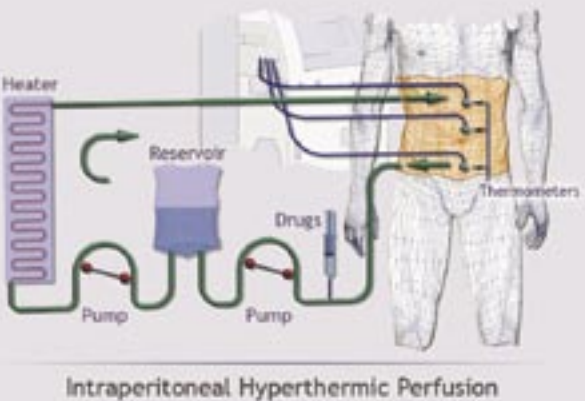
### **Heat potentiates drugs effect in killing tumoral cells**

This kind of intervention has already demonstrated its efficacy especially in fighting mesothelioma and pseudomixoma peritonei (rare neoplasie), but studies have demonstrated that it is effective even in the treatment of colon, stomach and ovary tumors. Further researches with the aim of estimating the effects of such therapy on these types of cancers are currently in progress.

## How the intervention is executed

It is a real “washing” of the abdominal zone executed through the insertion of four drains into the abdominal surface. These four cannulae are linked to an external circuit that functions like a pump. Two of them are necessary for the liquid infusion; the others, positioned respectively into the central-abdominal cavity and superficially into the pelvis, are necessary for the liquid effusion. The circulating solution is carried to 42-43 °C of temperature thanks to a heat exchanger.

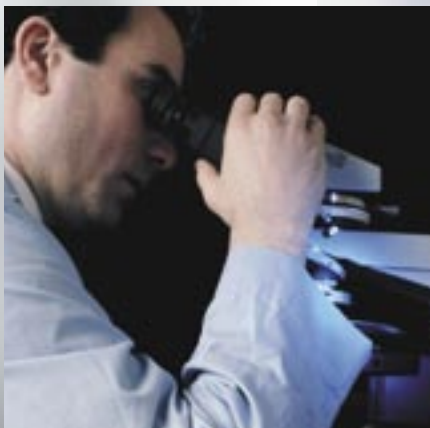
**With intraperitoneal chemohyperthermia  
chemotherapeutic drugs can be administered at  
extremely high concentration.**



The liquid remains into the blood-stream for approx. one hour and a half, with a half liter and over flow / min. in this way, the whole abdominal part is washed by the pharmacological solution and even the free tumoral cells can be reached. Once the treatment is finished, the liquid

is completely aspirated. Before re-opening the abdominal cavity, a further washing with a solution for peritoneal dialysis is made, for about 5 minutes.

Then, the operating equipe goes on with the surgical re-opening of the abdominal cavity and with its manual washing with warm water, in order to eliminate all blood clots and residual fragments.



## Lab tests

Part of the removed tumor can be sent to a lab, in order to obtain cultures of tumoral cells to be put in contact with different chemotherapeutic drugs.

In this way, it is possible to test in vitro the drugs to be used later in the systemic chemotherapy and eliminating those ineffective or toxic.

## Risks and undesired effects

It is an invasive and very aggressive intervention that requires the staying in the hospital for about one month (approx. one week in Intensive Care). The results reached up to now seem to reward these efforts: thanks to this therapy it is possible, today, to treat patients that, until a few years ago, didn't have the concrete possibility to be cured.

The results are remarkable, both in terms of increased survival and of life quality. There are specific risks linked to each one of the two treatment stages: during the surgical intervention some complications can in fact occur (15% of cases on average), so that the return to the operating theatre is possible. In the same way, some reactions to the utilized drug can occur (20% of patients on average). After the intervention, in some cases a cycle of covering systemic chemotherapy can be necessary.



## Where it can be executed

Thanks to this complicated procedure it has been possible to change the destiny of patients affected by peritoneal mesothelioma and pseudomixoma and there are good perspectives to utilize it even in the treatment of other types of cancer.

However, it is a very complicated procedure, that require the intervention of a specialized equipe and needs particular equipments. For this reason, not all centers are able to do it: if you wish to know which is the nearest fitted center to you, please go to the web-site

**<http://www.rand-biotech.com/>**

and write to the experts that will be able to give you all the necessary information.



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