gives as late sequelae malabsorption. Renal irradiation results in radiation nephritis and a picture of chronic nephritis appears later. Irradiation to the renal vessels can result in a development of malignant hypertension. Most striking is the growth retardation caused by radiation to bone and cartilage. Depending on the dose levels, different types of deformity may be induced in bones. If minimal injury is produced, a series of transverse growth arrest lines is noted in the metaphysis that progresses into the diaphysis and may eventually disappear. Irradiation of the epiphysial plate may result in stunting of the long bones. Femoral capital epiphyseal slippage may occur with a dose above 25 Gr. A significant degree of vertebral column deformity, which includes kyphosis, scoliosis, or lordosis is found after Wilms tumour treatment. After a variable time of growth retardation, normal bone growth may resume following exposure to doses in the range of 6 to 15 Gr. Permanent damage is produced with doses over 20 Gr. Mature bone and cartilage, when heavily irradiated with doses over 65 Gr, may undergo necrosis. The tolerance dose of fractionated radiation varies for the different tissues. Bone marrow, ovary, glands, testis, pubertal breasts and growing cartilage being most sensitive followed by kidney, lung. But all tissues will develop serious development disturbances with radiation dosis with over 60 Gr.

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Cardiac late effects after anthracyclines

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Anthracycline (AX) cardiotoxicity (CTX) is one of the most serious late effects of otherwise successful cancer treatment. Clinically, it presents as chronic, progressive, dilatative cardiomyopathy, ultimately leading to congestive heart failure and death. Angiotensine converting enzyme inhibitors have been used in order to treat patients with relevant cardiac dysfunction and heart transplants have been successfully performed in cases of terminal heart failure. Oxidative stress, probably mediated by AX-iron complexes, is made responsible for the initial damage. While there is no universal consensus on how to monitor for early signs of AX-CTX, echocardiography is often described as the method of choice. The incidence of significant AX-CTX was once thought to be rather low, provided cumulative doses remain <500 mg/m^2. It has, however, now become clear that subclinical damage, often measurable by noninvasive means, occurs in a considerable number of patients, if not in all. Risk factors for severe CTX include high cumulative AX dose, high peak levels due to rapid application, additional stress to the heart such as mediastinal irradiation, as well as probably young age and female sex. Unfortunately, the heart does not recover with time, on the contrary, cardiac function often deteriorates even years after treatment. Successful approaches to reduce AX-CTX include scheduling (application by prolonged infusion) and coadministration of the iron-chelator ICRF-187. While randomized studies evaluating the influence of those cardioprotective measures on AX-antitumor-efficacy are scarce, it seems that any negative impact, if present at all, is not as large as the positive effect on CTX.

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Analysis of a preventive-oriented strategy addressed to adults cured from a childhood cancer

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Introduction: Nowadays an increasing number of children recover from cancer and may become adults and productive members of our society. This may be a new field for preventive medicine: there is in fact a need to develop specific strategies and to define in this context the role of family physicians, pediatric oncologists, and other specialists.

Objective: To present a preventive-oriented strategy addressed to subjects cured from a childhood cancer and tailored to individual needs.

Methodology: In 1990 an "outpatient clinic for cured subjects" has been realized thanks to the contribution of our parents association. 397 subjects, who have withdrawn chemotherapy for over 2 years, are followed by a team which includes 3 pediatric oncologists, 1 social worker and 1 psychologist. The team also included several other specialists as consultants, working in the same hospital (dermatologist, surgeon, endocrinologist, gynecologist and orthopedic surgeon). We applied a program of personal intervention based on the clinical history of the patient and thus tailored to his specific needs. The outpatient clinic provides regular check-up (every 2 years) and is available for patients' requests and needs at any time. A computerized program has been prepared to manage and store all the information on the subjects.

Conclusions: The strategy allows to realize a preventive-oriented intervention and to gather information, lasting for several years. At the present time we are running a study on the "Satisfaction" of the subjects with the aim of revaluating and possibly modifying the organization of the program.

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Late deaths of long term survivors after childhood cancer

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Purpose: When does life expectancy become similar to that of the general population after treatment solid tumours?

Methods: We reviewed charts of 1753 patients (pts.) aged below 16 when treated at IGR between 1942 and 1979 and who survived at least five years. We analyzed survival data.

Result: In 1992, we had 1562 survivals FU of 19 years (5 to 47) and a age of 25 yrs (5 to 54). 171 pts had died. Among these, the am of death was identified in 153 cases: a recurrence of the primary in 67 cases; a second malignant neoplasm (SMN) in 42; a late complication of treatment in 33; accidents in 34. Ninety per cent of the pts survived 5 to 50 years. During the first 20 yrs, recurrences and complications were the main causes of death, SMN after 20 yrs. Factors associated with prolonged survival are: diagnosis of Wilms and neuroblastoma surgical treatment, treatment before 1960.

The excess of mortality compared to the general population varied with time and tumor type.

A part from CNS and soit tissue tumors, the excess of mortality falls to zero 22 to 30 years after diagnosis.

Conclusion: in this population, heavily ted, with little or no chemotherapy, 70% of all 5 yrs survivors recover a normal life span after a maximum of 30 yrs.

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Lymphatic mapping and sentinel node biopsy

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Lymphatic mapping can identify the (sentinel) lymph node that receives drainage directly from a primary cutaneous melanoma. The most reliable technique involves dynamic lymphoscintigraphy, followed by surgical exploration with the aid of a vital dye and a gamma detection probe. Patients with non-palpable metastatic disease can now be selected for regional node dissection in an early phase. The meaning of this approach in terms of regional tumour control and survival is currently being investigated.

Just last year, breast cancer was also shown to disseminate sequentially through the lymphatic system. Currently, a variety of scintigraphic and surgical techniques is being explored for lymphatic mapping in this disease. When the preliminary results are confirmed in a prospective randomized study, there will be a substantial reduction of the number of axillary node dissections without compromising survival and regional control, while the same prognostic and staging information will remain available.

Lymphatic mapping with sentinel node biopsy is one of the most interesting among the recent developments in surgical oncology and may have far reaching ramifications.

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Immediate breast reconstruction in breast cancer

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The first important decision is whether the patient actually needs a mastectomy. Partial reconstruction of the breast after removal of large volumes of tissue involves use of the latissimus dorsi muscle. The newest technique involves removal of latissimus dorsi muscle and overlying fat without removing any skin from the back. Once the decision has been taken to perform a mastectomy the next option for reconstruction is whether this should be performed immediately or as a delayed procedure. The cosmetic results are significantly better with immediate than delayed reconstruction. The reasons why women wish breast reconstruction include to wear normal clothes, to feel balanced, to feel whole, so that they are less preoccupied with their physical state, to feel more feminine and so that they are less preoccupied with cancer. In general, patients who have reconstruction have reduced levels of psychological morbidity and higher levels of social and sexual function. Satisfaction with reconstruction is greater in patients af-

ter immediate than after delayed reconstruction. At least 13% of patients who have conservation are unhappy with the cosmetic result and some of these patients require reconstructive surgery. Techniques available for breast reconstruction include the use of prostheses, tissue expanders and myocutaneous flaps. Selection for different technique is based on breast size and patient's preference.

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Tumor prosthesis in bone sarcomas

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Introduction: Improved patient prognosis and better local control of the tumor widened the indications to limb salvage. Endoprosthetic devices allow for one early weight bearing and good functional results.

Purpose: To review the experience of the Rizzoli Institute with the use of tumor prostheses in bone tumor surgery.

Methods: From April 1983 to June 1995 475 prostheses were used for reconstruction in patients with bone tumors. Most frequent histotypes were osteosarcomas (298) and. chondrosarcomas (52). Locations were the proximal femur (73), distal femur (280), proximal tibia (97), femur and tibia (5), total femur (7), proximal humerus (7), elbow (4), total humerus (2). Modular Replacement prosthetic system was used (HMRS from Howmedica). Since 1989 allograft prosthesis composites were preferred in proximal humerus (5), proximal femur (22) and proximal tibia (19). Functional analyses (according to the MSTS) was performed.

Results: In prosthetic reconstructions major complications included infections (8%) and wearing of the polyethylene bushes. In APCs fracture of the greater throcanter (4%) and post-traumatic patellar tendon detachment (4%) were observed. There were 37 local recurrences (7%), 136 pulmonary metastases (26%) and 43 skeletal metastases (8%). Functional results were good or excellent in most of the cases.

Conclusion: The uncemented modular prosthetic system offered versatility and good functional results after tumor resections. APCs allowed better functional results due to the anchorage of tendons and soft tissues.

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Sphincter preserving surgery for rectal cancer

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Avoiding permanent colostomy has been a challenge in rectal cancer surgery for many years. Only recently exact measurement of postoperative function and of quality of life gained more interest.

Local excision in early tumor stages is well accepted, but questioned for more advanced tumors. The role of additional radiotherapy is not clear. For rectal resection the clear distal margin has been defined. Wide experience has been gained performing low supraanal or perianal anastomoses. Even partial resection of the sphincter muscle has been done to avoid colostomy. The importance of lateral margins has been addressed by Dr. Heald who introduced the technique of TME. Establishing coloanal pouch procedures has been an important step to improve the functional results of low anastomoses.

Quality of life after rectal cancer surgery includes the postoperative function of genitourinary nerve as well. Nerv preserving surgery must be attempted, but it is not always possible in very low tumors.

There is a consensus to include radiotherapy and chemotherapy within a multimodal concept in advanced rectal cancers. Morbidity of the combined approach is higher for the postoperative irradiation.

Local relapse however represents the severest cut down on quality of life.

There should be no compromise regarding distal and lateral clearance and combined modality treatment to achieve durable local control.

Quality of life in rectal cancer reflects more than sphincter preserving surgery, good functional results and relapse free survival. Competent care of physical problems and attention to coping difficulties are important as well.

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Staging laparoscopy for gastro-intestinal tract malignancies

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Background: Preoperative treatment planning should be based on detailed staging. Moreover, exploratory laparotomies should be avoided in palliative situations and operations be performed with minimal morbidity not to compromise the limited survival time of those patients. Operative laparoscopy can contribute to both aims.

Patients and Methods: 277 patients underwent laparoscopy for cancer of the esophagus, stomach, pancreas, rectum, or liver from 1993–96. In addition, we used laparoscopic ultrasound in 124 patients to detect liver and lymph node metastases, and to assess whether the tumor infiltrated to major vessels.

Results: We detected intraabdominal metastatic spread unknown from imaging procedures in 5%–34% of our patients depending on the primary tumor. As a consequence, the initial treatment concept had to be modified in 9% to 29% of them. The gain of information on tumor spread by staging laparoscopy was best in patients with esophageal and pancreatic cancer. Palliative procedures by laparoscopy (gastro-enterostomy, bilio-digestive drainage, jejunal feeding tube, colostomy) could be performed in 33 patients, thus avoiding laparotomy.

Conclusion: Staging laparoscopy offers an optimum of information about intraabdominal spread of GI-tract tumors if combined with laparoscopic ultrasound. It should be mandatory in neoadjuvant phase II and III trials to improve the quality of treatment with curative intent It also may contribute to an improved quality of life in palliative situations detecting incurable situation and avoiding laparotomy.