prostate, we are currently at 80 Gy with no evidence of increased complications compared to conventional doses. These results with conformal radiotherapy will be discussed in detail.

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IS THERE A ROLE FOR NUTRITION AND METABOLIC MANIPULATION IN CANCER TREATMENT

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Cancer is frequently associated with development of clinical depletion. The factors implicated in the development of clinical depletion are either decreased nutritional intake or increased energy expenditure both without adequate compensation and therefore resulting in a negative energy and protein balance. Other factors implicated in the development of clinical depletion are changes in host intermediary metabolism. In what way the changes in energy and protein homeostasis and in intermediary metabolism are triggered is not known. Hormones, neurogenic factors and cytokines have been implicated in addition to the well known changes in glucose metabolism. More recent research is focused on the characterization of altered fat metabolism and altered protein metabolism. Especially the role of the conditionally essential amino acid glutamine has attracted much attention.

The clinical implications of the presence of nutritional depletion include increased morbidity of cancer treatment and a shorter long term survival. Efforts to correct the presence of nutritional depletion by administration of artificial nutrition either enterally or parenterally have not resulted in a beneficial effect on the clinical course of chemotherapy treated patients or of radiotherapy treated patients, whereas perioperative nutrition support in severely depleted patients has resulted in an improved postoperative course, without detrimental effects on long term survival. The availability of new substrates enabling physicians to manipulate intermediary metabolism seems to improve the efficacy of artificial nutrition. More and especially clinical work will hopefully substantiate this.

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APOPTOSIS: ITS ROLE IN DRUG SENSITIVITY AND RESISTANCE

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Apoptosis is the phenomenon whereby cells are deleted during development, tissue homeostasis or after damage (e.g. potentially carcinogenic DNA damage). Apoptosis is essentially a cell suicide process and is controlled by the products of key genes. For example, after DNA damage levels of the tumour suppressor protein p53 are elevated: this induces either a cell cycle "checkpoint", preventing the cell from replicating a damaged template, or apoptosis, deleting a cell which may be mutated. Expression of the bcl-2 or bcl-xL genes inhibits apoptosis. The signals from certain growth factors and cytokines also inhibits apoptosis. Thus, the survival capacity of a cell depends on the balance between pro- and anti-apoptotic stimuli. The finding that all cytotoxic chemotherapeutic drugs initiate apoptosis is important because the genes which control cell death will modulate the response of cells to cytotoxic drug-induced damage. For example, many bladder carcinomas, which are inherently resistant to therapy express high levels of bcl-2 and have mutant p53 whereas testicular tumours have wild-type p53 and no bcl-2.