

Therapeutic gain

It is the difference of the radiation dose required for tumor control and the dose producing normal tissue toxicity. The bigger the difference, the better the therapeutic gain.

Therapeutic ratio

It is a method of comparing two radiotherapy regimes and is expressed as the ratio of the % difference in tumor control between the 2 regimes, divided by the % difference of complications between the 2 regimes. The higher the therapeutic ratio/ therapeutic gain factor, the more efficient that particular therapy is.

Goldie-Coldman hypothesis

According to the Goldie-Coldman hypothesis, the genetically determined chemoresistance of tumor cells is a random process, the probability of which increases with increasing number of cells.

It therefore suggests the use of combination chemotherapy in order to minimize the chances of development of cellular resistance.

Norton-Simon hypothesis

According to the Norton-Simon hypothesis, the treatment of a cancer needs to be intensified near the end. This idea is derived from the Gompertzian growth curve which shows that the less the tumor bulk, the greater the rate of growth-this is the situation that pertains near the end of an anti-cancer treatment regimen- it suggests the use of dose-intensified chemotherapy at this point in order to deal effectively with the rapidly proliferating tumor cells.

Gompertzian growth

Cancers show a triphasic pattern of growth. Initially, the rate of growth is slow. This is followed by a phase of exponential growth. Finally, the growth rate plateaus, due to shortage of nutrients.

It suggests that when a tumor is large enough to be detected, its growth rate is low.

Growth fraction

The proportion of cells in a tumor which are in proliferating mode.

Bergonie & Tribondeau Law (false)

Ionising radiation is more effective against cells with a greater reproductive activity and particularly on cells with a longer dividing future ahead. Radiation destroys tumor without destroying normal tissues.

Radiocurability

It refers to the eradication of tumor at the primary or regional sites and reflects a direct effect of the irradiation but does not necessarily equate with the patient's cure from cancer.

Radiosensitivity

It is a measure of tumor-radiation response, thus describing the degree and speed of regression during and immediately after radiotherapy.

Reasons for the different radiosensitivities of tumors

- (1) Hypoxia
- (2) Proportion of clonogenic cells
- (3) Inherent radiosensitivity of cells
- (4) Repair of sublethal damage