



Cancer Treatment and Evolution of Chemotherapy

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Most of the cancer treated surgery, radiotherapy or chemotherapy either single modality or as multimodality.

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Surgery used to remove gross tumour with adequate margins, so that minimum number of cancer cells remain there. Afterwards radiotherapy kill cancer cells by damaging DNA as well as by free radical mechanism. Radiotherapy can be used for limited doses, doses decided depends upon surrounding normal tissues. Chemotherapy plays very important role by decreasing cancer cell burden, preventing systemic spread, making unresectable tumour to resectable.

Chemotherapy is the use of drugs to kill cancer cells. Chemotherapy has been used to treat cancer for many years, and the field has evolved significantly over time.

- Early chemotherapy: The first chemotherapy drug, nitrogen mustard, was developed in the 1940s. It was initially used to treat soldiers exposed to mustard gas during World War II, and later found to be effective against certain types of cancer. In the 1950s and 1960s, other chemotherapy drugs were developed, including methotrexate and fluorouracil. Methotrexate and 5FU work as main agent in many chemotherapy regimens in 2023 too.

- Combination chemotherapy: In the 1970s, researchers began to explore the use of combination chemotherapy, which involves using two or more drugs together to improve effectiveness and reduce the risk of drug resistance. Combination chemotherapy became a standard treatment for many types of cancer.
- Targeted therapy: In the 1990s, researchers began to develop drugs that target specific molecules or processes in cancer cells. These targeted therapies can be more effective and have fewer side effects than traditional chemotherapy. Examples of targeted therapies include trastuzumab for HER2-positive breast cancer and Imatinib for chronic myelogenous leukemia.
- Immunotherapy: In the past decade, immunotherapy has emerged as a promising new approach to cancer treatment. Immunotherapy drugs harness the power of the immune system to fight cancer. Examples include checkpoint inhibitors (Nivolumab) and CAR T-cell therapy (a type of gene therapy that uses a patient's own immune cells to target cancer).