



## MEDICAL BREAKTHROUGHS RESEARCH SUMMARY

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**BACKGROUND:** A new type of chemotherapy may reduce side effects like nausea and fatigue. One-third of patients stop chemotherapy or never even try for a second attempt at chemotherapy. Cancer patients sometimes stop chemotherapy or never go back for a second round because they can't endure the debilitating side effects like nausea, vomiting, diarrhea and fatigue. But now a new method of chemotherapy, called chronotherapy, is being introduced in the United States after years of use in Europe.

**WHAT IS CHRONOTHERAPY?** Chronotherapy is all about timing. It coordinates the delivery of potent chemotherapies with the body's own internal clock. Chronotherapy is given in a bolus dose in a very short window of time, similar to a quick infusion. Unlike regular chemotherapy that's either given as a large dose in a short time period, or a continuous dose throughout the day, chronotherapy releases various doses of drugs over a long period of time, peaking when cancer cells are most active and healthy cells are at rest. As a result -- patients say they experience fewer interruptions to their daily lives and fewer side effects.

**HOW IS IT ADMINISTERED?** Chronotherapy provides chemotherapy at a specific time -- when healthy cells are resting and least sensitive to the drugs. This is also a time when cancer cells are the most active and therefore the most sensitive to treatment. Drugs are administered intravenously, through a pump which can be worn as a fanny pack around the waist or as a purse. The pumps contain a software program that allows them to adjust four different drugs at any time of the day or night.

**WHERE IS IT ADMINISTERED?** The majority of centers are in Europe. Keith Block, M.D., Medical/Scientific Director of the Block Center for Integrative Cancer Care and Optimal Health in Evanston, IL, administers chronotherapy.

**HOW IS IT DIFFERENT?** Chronotherapy results in lower levels of toxicity. It has been shown to improve tolerance to treatments. It also improves respiratory rates. Dr. Block says: "Every drug has an optimal time when it is least toxic and most effective. This is determined by several factors, including the biological uniqueness of the particular drug being given, the time when the specific type of cancer cells divide the most, when the normal healthy cells of the patient generally divide the least, the patient's circadian clock and individual rest-activity cycles - assessed at the Block clinic - and even the time zone the person resides in. This method of administering chemotherapy is revolutionary and has demonstrated in large randomized trials its potential to improve survival."

**FURTHER STUDY:** Many oncologists say chronotherapy needs further study, as it seems very difficult to predict when cells are more and less active.