

## Adjuvant Cannabinoid Therapy for Pancreatic Cancer<sup>1</sup>

In over 20 states, cancer patients have access to cannabinoids (aka medical marijuana) and use them to treat symptoms of chemotherapy, such as nausea and lack of appetite. However, new evidence, both scientific and empirical, suggests that higher doses of cannabinoids may be an effective adjuvant alongside traditional chemotherapy agents, such as Gemcitabine. While nausea is controlled with daily dosages of 10 to 40mg, pancreatic cancer cells are known to over express the endo-cannabinoid receptor CB1 one hundred fold. Cannabinoids target different receptors than traditional chemotherapy agents and have low combinatorial toxicity, and as such present a class of new treatments. In an n=1 study of a patient with stage IV pancreatic adenocarcinoma, we augmented the standard Gemcitabine chemotherapy with balanced initial doses 50mg THC and 50mg CBD and increased over a four week period to achieve a 12.5 mg/kg dosage. Curiously, after ten days the patient stopped presenting signs of cannabinoid use, such as red eyes, slurred speech and clumsiness. However, the patients CA-19-9 marker increased from 8,800 at diagnosis to 26,000. Over the next four weeks, dosage of CBD was held constant and THC was increased to 1050mg daily for a dosage of 20 mg/kg. At week 6, the CA-19-9 marker began decreasing and cannabinoids were leveled off, although a higher dosage was planned for weeks 8-12. At week 15, CA-19-9 markers dropped to pre-diagnosis levels and a CAT scan revealed shrinkage of the tumor. We anticipate continued tumor shrinkage and reduction of CA-19-9 marker levels to normal levels by week 20. Although many pancreatic cancer patients have access to cannabinoids, issues such as potency, purity and bio-availability will impact future adjuvant cannabinoid therapies. We have addressed the issues with existing technology and hope to conduct large scale trials to examine the efficacy of Gemcitabine + cannabinoids in the treatment of pancreatic cancer.

Note: this data is being provided in real-time, so updated CA-19-9 markers and tumor sizes from CAT scan will be available to present at the AACR conference.

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