

# Surviving Through Chemotherapy

## Cytoprotectant drugs

Nausea and vomiting linked with chemotherapy are among the most severe side effects and concerns of patients receiving treatment. The fear of chemo-induced nausea and vomiting can result in patients receiving sub-optimal dosing of chemotherapeutic agents or even in patients refusing to continue therapy because of nausea and vomiting. 25 – 50% of patients with uncontrolled emesis delay one or more courses of chemo or refuse further treatment. Patients can develop anxiety and depression, and severe cases can result in other complications, such as aspiration pneumonia, weight loss, malaise, dehydration, fractures, and esophageal tears. This can have a dramatic effect on quality of life thus effective control of nausea and vomiting is a primary goal in patients receiving chemotherapy. Don't hesitate to ask the doctor to prescribe medication. Chemotherapy is hard enough that no one should have to endure an unnecessary amount of nausea. To get the maximum relief from the nausea may require the use of two or three different types of drugs in combination.

With an arsenal of drugs, including new agents at the physician's disposal, the problem can be eliminated. Some patients experience an automatic feeling of nausea and vomit when they know they're about to receive a treatment. It can be triggered by smells or hospital surroundings or by thoughts and memories of previous treatments. This is a conditioned response and Ativan, Valium and Versed, anti-anxiety medications are commonly used with other agents to diminish this nausea and vomiting.

The dosage and method of administration can also affect the frequency of CINV (chemo- induced nausea and vomiting). Cisplatin is considered one of the most highly emetogenic agents and when given in doses <sup>3</sup> 50 mg/m<sup>2</sup> can induce acute nausea and vomiting within 24 hours.

The following table shows the frequency and severity of CINV for each agent:

### Emetogenic Potential of Chemotherapeutic Agents

#### Chemotherapeutic Agent (mg/m<sup>2</sup>)

##### Level 5:

Extremely Emetogenic

(frequency >90%)

Carmustine (>250)

Cisplatin (>= 50)

Cyclophosphamide (>1,500)

Dacarbazine

Mechlorethamine

Streptozocin

Level 4:

Highly Emetogenic

(frequency 60% to 90%)

Carboplatin

Carmustine ( $\leq 250$ )

Cisplatin ( $<50$ )

Cyclophosphamide ( $>750$  to 1,500)

Cytarabine ( $>1,000$ )

Doxorubicin ( $>60$ )

Methotrexate ( $>1,000$ )

Procarbazine (oral)

Level 3:

Moderately Emetogenic

(frequency 30% to 60%)

Cyclophosphamide ( $\leq 750$ )

Cyclophosphamide (oral)

Doxorubicin (20 to 60)

Epirubicin ( $\leq 90$ )

Hexamethylmelamine (oral)

Idarubicin

Ifosfamide

Methotrexate (250 to 1,000)

Mitoxantrone ( $<15$ )

Level 2:

Low Emetogenicity

(frequency 10% to 30%)

Docetaxel

Etoposide

5-Fluorouracil ( $<1,000$ )

Gemcitabine

Methotrexate ( $<50$  to  $<250$ )

Mitomycin

Paclitaxel

## Level 1:

Non-emetogenic

(frequency <10%)

Bleomycin

Busulfan

Chlorambucil (oral)

Fludarabine

Hydroxyurea

Methotrexate ( $\leq 50$ )

L-phenylalanine mustard (oral)

Thioguanine (oral)

Vincristine

Vinorelbine

## Effective Anti Nausea Medications:

Anti-emetics: Nausea and vomiting are the most uncomfortable side effects of chemotherapy. The schedule and dosage of these medications depends on the type and amount of chemotherapy used. They are best used immediately prior to chemotherapy. Zofran or Kytril are used in combination with Decadron. This eliminates nausea and vomiting in over 95% of patients. Most important, keep the body hydrated and drink plenty of water.

Kytril tablets (SmithKline Beecham): Can be taken either once or twice daily to prevent nausea and vomiting associated with repeat courses of chemotherapy, including high-dose cisplatin. Adverse effects may include: headache (mild to moderate); constipation; asthenia; diarrhea; and abdominal pain. Adverse effect of Kytril tablets was similar to adverse effects of intravenous Kytril. Tablets are more cost effective, as there is no intravenous maintenance. However, some insurance companies have refused to cover the cost which can be \$50-\$80 per pill!

Compazine (SmithKline Beecham): Helps control and/or prevent nausea and vomiting. Compazine can be taken orally, intravenously or rectally. Possible side effects include restlessness, drowsiness, and agitation. (Also used as an anti-psychotic).

Zofran (Glaxo Wellcome Inc.): Anti-nausea/vomiting medication. Common side effects are dizziness, headache, drowsiness, constipation, diarrhea, dry mouth and skin rashes.

Anzemet (Hoeschst Marion Rousell): This is a new anti-nausea medication, which can be administered orally or intravenously prior to chemotherapy session and can be repeated afterwards. When administered intravenously,

may cause irregularities in cardiogram, and may cause fatigue and diarrhea.

Corticosteroids for use as antiemetics in cancer therapy include

Decadron (Dexamethasone, Prednisone, Hydrocortisone)

The drugs come in tablet and intravenous form. Decadron is normally administered along with Zofran. The side effects of Decadron depend on the amount and schedule of the administration of the steroids but can be irritation of the stomach, stomach ulcer, high blood pressure, osteoporosis, and fluid retention (which may increase the risk of kidney stones). Corticosteroids may cause a loss of control of diabetes by increasing blood glucose (sugar).

<http://onhealth.com/ch1/resource/pharmacy/Drug/item,22192.asp>

Dronabinol (Marinol): Derived from the marijuana plant. It is an effective vomiting blocker and works as an appetite stimulator. There are undesirable side effects such as dizziness, blurred vision, memory loss and a euphoric feeling.

Medical Cannabis:

<http://www.ukcia.org/medical/default.htm>

<http://www.ukcia.org/medical/cancer.html>

<http://www.ukcia.org/medical/cancer.html#sci>

Ginger Root Tea: Grate fresh root and simmer 1 teaspoon for 3-5 minutes, strain and sip (makes one cup) <http://ralphmoss.com/nausea.html>

White Oak Bark Tea: Simmer, strain and sip...will be very bitter as it is an astringent. Can take white oak bark capsules.

#### What to Avoid

- Very hot or very cold foods. Room temperature is best.
- Greasy, fried foods
- Sweet, salty, or spicy foods
- Foods with strong odors
- Drinking liquids with meals. Liquids at mealtime can make you feel bloated. Drink liquids an hour before or after meals.
- Your favorite foods. If you feel nauseated and force yourself to eat your favorite foods, you may develop a permanent dislike for them
- Eating or drinking until vomiting is under control. Once you're sure vomiting has stopped, try only small amounts of clear liquids for several hours

#### Relax

- Rest in an upright, seated position after eating. Avoid reclining or lying prone.
- Avoid over-stimulation before treatment whenever possible. Relax in a quiet, darkened room
- If nausea hits, take deep breaths and relax
- Self-hypnosis, meditation, imagery/relaxation exercises may prove helpful
- Listen to your favorite music or watch television
- If you experience nausea at a certain time of day, ask your doctor about varying the time of your treatment

Note: It is imperative that patients relay any side effects or problems to the medical oncologist.

Contributed by Kathy Leslie

#### Cytoprotectants

Aside from leaving a person vulnerable to infection, cancer drugs can also damage the cells of the nervous system, bladder, kidney, lungs and heart. Medications are available to help manage some of the effects of chemotherapy:

Mesna (MESNEX, Uromitexan), is a drug

used to reduce the harmful effects on the bladder (hemorrhagic cystitis) from chemotherapeutic agents cyclophosphamide and ifosamide. Aside from being a protectant against urotoxicity, Mesna has been shown to be an anti-tumoral agent. For favorable reviews from the drug company: [http://www.pharmacyhealth.net/d/mesnex-](http://www.pharmacyhealth.net/d/mesnex-6801.htm)

6801.htm

This link takes you to the National Cancer Institutes

descriptions of Mesna, including side effects: <http://www.cancer.gov/clinicaltrials/developments/newly-approved-treatments/page14>

Neupogen (FILGRASTIM) is used

to stimulate production of white blood cells needed to fight infection, and to reduce duration of neutropenia caused by chemotherapy. <http://www.neupogen.com/patients/patientpi.html>

Lenograstim (Granocyte[recombinant human granulocyte colony stimulating factor rG-CSF]) This drug is a member of the same therapeutic class as Neupogen: 'Leukocyte (wbc) Stimulants'. By helping to restore neutrophil (white blood cell) levels, Lenograstim/Granocyte decreases the risk of infections and helps patients remain on optimum doses of chemotherapy. A recent Japanese study which evaluated the use of this drug for chemotherapy induced neutropenia in patients receiving M-VAC for urothelial cancer concluded that Lenograstim was useful in reducing the duration of neutropenia as well as the duration of antibiotic therapy.<sup>1</sup>

Procrit (Epoetin-eh-POH-ee-tin) is a synthetic version of human erythropoietin (EPO), which is a hormone produced naturally in the body, mostly by the kidneys. It stimulates the bone marrow to produce red blood cells. If the body does not produce enough EPO, severe anemia can occur. This often occurs in people whose kidneys are not working properly. Epoetin is used to treat severe anemia in these people. Epoetin may also be used to prevent or treat anemia caused by other conditions <http://onhealth.com/ch1/resource/pharmacy/Drug1/item,28276.asp>

Procrit a survival risk? In a study published in the medical journal The Lancet, the epoetin group turned out to have a 62 percent greater chance of suffering a recurrence and a 339 percent

greater chance of dying. The authors concluded that epoetin beta "corrects anemia but does not improve cancer control or survival. Disease control might even be impaired" (Henke, Oct. 18, 2003)

Leucovorin is a faster acting and more potent form of folic acid. It is used as a "rescue" after high dose methotrexate therapy to lessen and counteract the effects of methotrexate toxicity and other folic acid antagonists. It is also used to treat anemia when oral therapy with folic acid is not possible.

[www.medscape.com](http://www.medscape.com)  
(drug search)

Dexrazoxane is used to prevent or treat doxorubicin (Adriamycin)-induced cardiotoxicity. This drug can reduce the antineoplastic activity of doxorubicin. Dexrazoxane is also myelosuppressive and may increase the risk of developing secondary malignancies.<sup>2</sup>

These sites may also be helpful:

[www.jasper-web.com/texascanceronline/prevention.htm#5](http://www.jasper-web.com/texascanceronline/prevention.htm#5)

<http://www.worldmegastore.com/cf/index.php?command=drugs>  
back to invasive bladder cancer

#### References

1. Effect of recombinant human granulocyte colony stimulating factor (lenograstim) on chemotherapy induced neutropenia in patients with urothelial cancer. Kotake T; Usami M; Miki T; Togashi M; Akaza H; Kubota Y; Matsumura Y Int J Urol 1999 Feb;6(2):61-7 Department of Urology, Osaka Medical Center for Cancer and Cardiovascular Diseases, Japan. UI - 99243396

#### 2. Dietary

Antioxidants During Cancer Chemotherapy: Impact on Chemotherapeutic Effectiveness and Development of Side Effects Kenneth A. Conklin From Nutrition and Cancer 37(1):1-18, 2000. © 2000 Lawrence Erlbaum Associates, Inc.