

# cancer answers

Cancer Answers is a series of free public lectures, presented by *Cancer Care Nova Scotia*, on a variety of cancer-related topics. The lectures, delivered by cancer experts, are designed to raise awareness and educate participants about issues related to prevention, screening, early diagnosis, treatment, survivorship and palliative care.

Following each lecture, the presentations are posted on the *Cancer Care Nova Scotia* website.

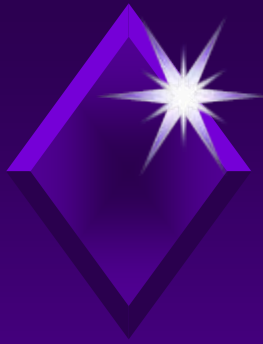


# ***Long-term Side Effects of Chemotherapy: The Road Less Traveled?***



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**CCNS Cancer Answers Public Lecture  
Royal Bank Theatre, HI Site  
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# ***A Little History About First Chemotherapy***

- ◆ **U.S. Department of Defense**
  - ◆ **Chemical Warfare Division**
  
- ◆ **Mustard Gas**
  - ◆ **Low white/lymph blood cells**
  
- ◆ **?? Treatment for lymphoma**



***Now ...***

- ◆ **Over 100 different ‘chemotherapies’**
- ◆ **Over 271 different treatment regimens listed in CCNS Systemic Therapy Manual (2008)**







- ◆ **Not all IV treatment = chemotherapy**
  - ◆ **Bone protectors**
  - ◆ **Antibodies (immune therapy)**
  - ◆ **Vitamins**



- ◆ **Not all chemotherapy = IV treatment**
  - ◆ **Pill form (colon cancer, myeloma)**



- ◆ **Not all pills = chemotherapy**
  - ◆ **Hormonal treatment for breast cancer**
  - ◆ **Small molecules (lung cancer, kidney cancer)**



## *Why So Many Side Effects?*

- ◆ Targeting of rapidly dividing/growing cells
- ◆ Unpredictability of how our body will 'handle' the drug



# ***Normal Rapidly Dividing Cells***

- ◆ **Hair follicles**
  - ◆ Hair loss
- ◆ **Cells lining digestive system (mouth → anus)**
  - ◆ Nausea, vomiting, diarrhea, mouth sores
- ◆ **Bone marrow (blood factory)**
  - ◆ Low blood cells, anemia, bleeding, fever, ↑ risk of infection
- ◆ **Skin**
  - ◆ Rashes, dry skin

Same as others



Probably more than others



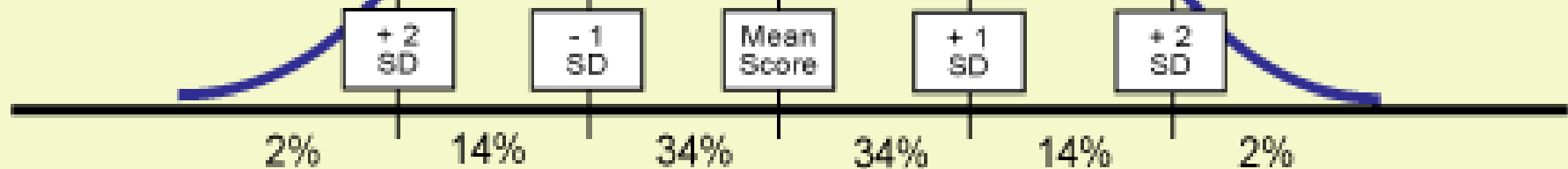
Probably less than others



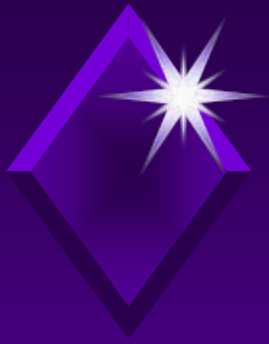
Definitely more than others



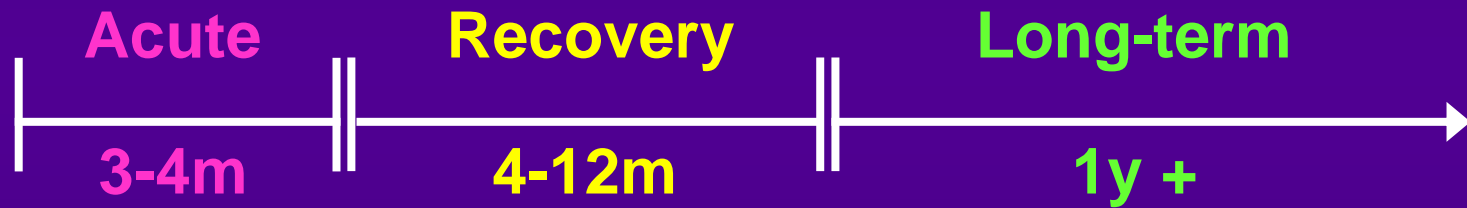
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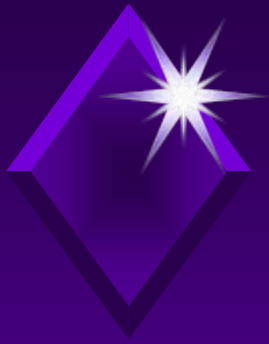


SD = Standard Deviation



# *Side Effect Timeline*





## ***Blood***

- ◆ May take 4-6 weeks following treatment for blood counts to normalize
- ◆ **Low red cells (anemia)** may contribute to post-treatment fatigue
- ◆ **Low white cells** should normalize 3-4 weeks after last treatment



## *Myths*

- ◆ Eating more meat or taking iron pills will boost my red blood cells
- ◆ Isolation will reduce my risk of fevers



## ***Long-term Side Effects***

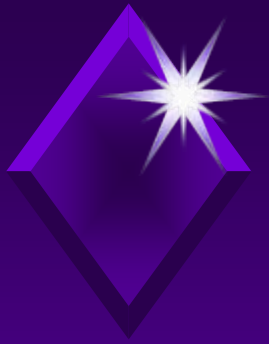
- ◆ **Myelodysplastic syndrome**
- ◆ **Acute leukemias**
  
- ◆ **Risk after 'standard' adjuvant breast cancer chemotherapy: ~ 0.37% at 8 years**

Praga C et al. J Clin Oncol 2005.



## *The Future*

- ◆ **Far less use of chemotherapy that is known to cause long-term changes in the bone marrow**



## *What Can You Do?*

- ◆ Blood counts are not modifiable
- ◆ Listen to your body
- ◆ Report fevers to your oncology team



# *Heart – During Treatment*

## ◆ 5-FU/Xeloda

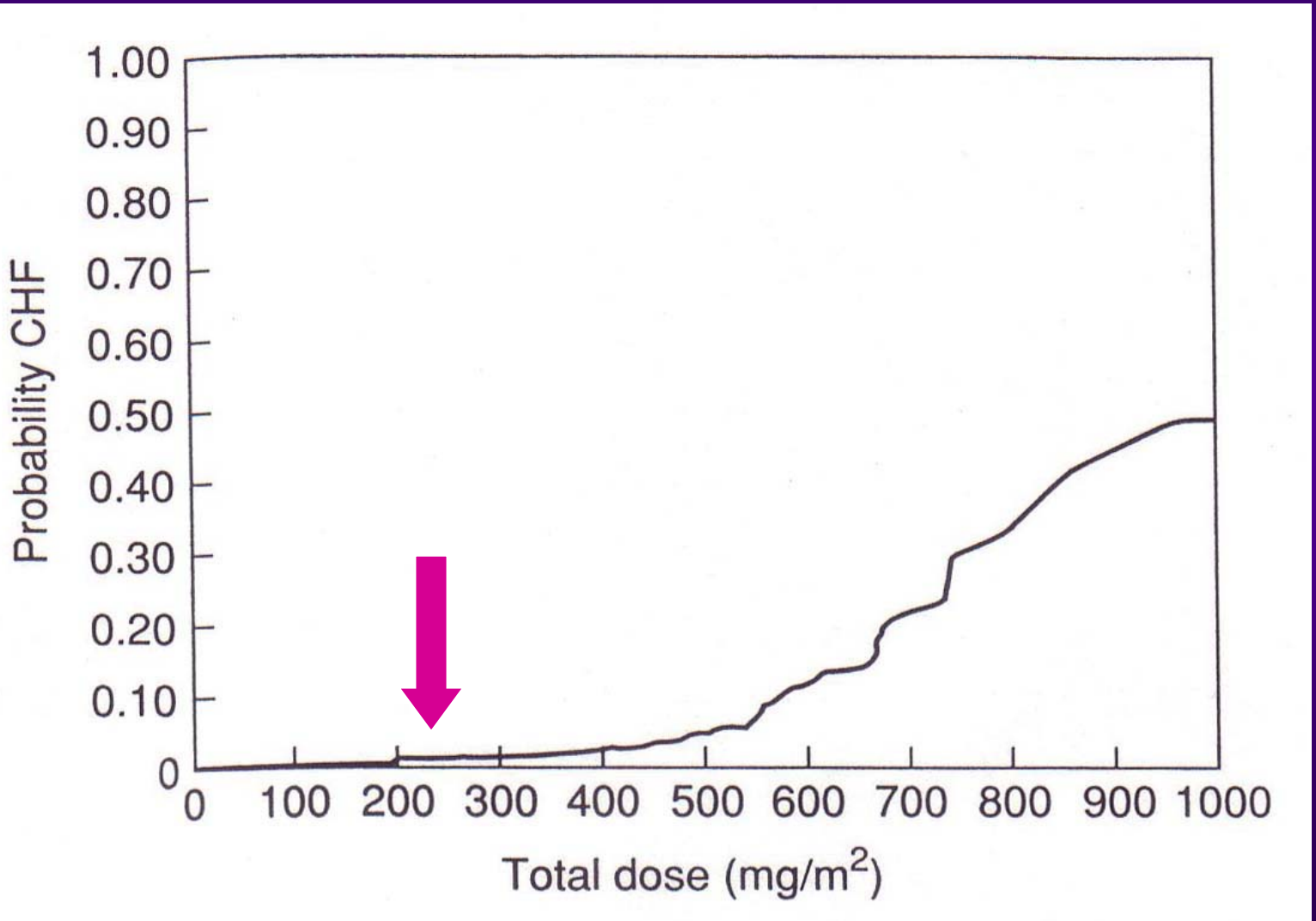
- ◆ Colon/rectal cancer
- ◆ Breast cancer

- ◆ Coronary artery spasm
  - ◆ Angina

- ◆ Rhythm problems
  - ◆ Palpitations
  - ◆ Feeling faint

- ◆ Risk is not influenced by pre-existing heart disease but consequences may be!!

# *Incidence of Clinical Congestive Heart Failure According to Cumulative Dose of Doxorubicin (All Patients)*





## *Myths*

- ◆ **Chemotherapy-induced heart failure is irreversible**
- ◆ **Herceptin causes same problems as chemotherapy**



## *What Can I Do?*

- ◆ Ideally, maintain heart-healthy lifestyle to minimize underlying risk of heart disease in general
- ◆ Report new symptoms such as palpitations, chest heaviness/achiness, inability to sleep flat, waking up short of breath at night
- ◆ Continue all heart/BP medications during treatment **unless advised otherwise**



## *The Future*

- ◆ **Better therapies for heart failure minimizing long-term problems**
- ◆ **Minimization of drugs known to lead to problems (i.e.: anthracyclines)**
- ◆ **Better understanding of mechanisms underlying cardiac side effects**
- ◆ **Early intervention**



## *Kidneys*

- ◆ **Risk: Kidney damage/failure**
  - ◆ **Cis-platinum** for lung cancer, unknown primary cancer, testicular cancer
- ◆ **Can develop while on treatment but sometimes after last cycle and can be longstanding**
- ◆ **Monitored via blood tests each cycle**



## ***Risks***

- ◆ **Pre-existing kidney troubles (i.e.: hypertension, diabetes)**
- ◆ **Poor/insufficient hydration during treatment (i.e.: nausea/vomiting; altered taste buds)**



## *Myths*

- ◆ **Need to drink 8 full glasses of water/day to ‘flush the kidneys’ or ‘flush the chemotherapy’ out**





*Reality*

◆ Anything 'wet' works



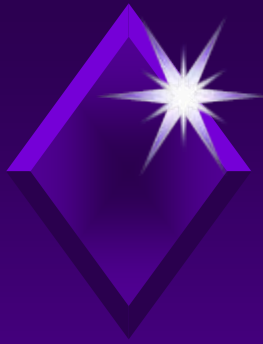
## *Prevention*

- ◆ **IV fluids often ordered before/after treatment**
- ◆ **Mannitol often added**



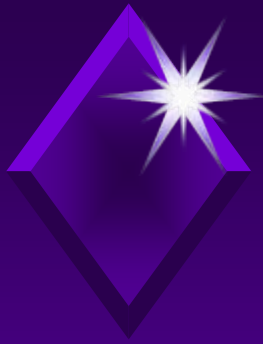
## *What Can I Do?*

- ◆ Good diabetes/blood pressure control
- ◆ Try and drink **a variety** of 'wet' drinks per day totalling ~ 8 glasses, especially in first 5-7 days after treatment
- ◆ Take anti-nausea pills as prescribed; advise oncology team if breakthrough symptoms



# ***Nerves***

- ◆ **Platinums, taxanes, others**
- ◆ **Numbness/tingling**
  - ◆ 'Stocking-glove' distribution
  - ◆ Usually slowly progressive, worsening with each treatment
- ◆ **Progresses from tips of fingers/toes up**
- ◆ **Can be painful or painless**
- ◆ **Almost always purely 'sensory'**



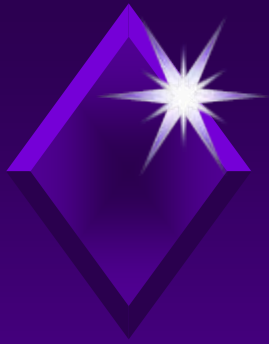
## ***Nerves: Very Slow to 'Heal' or 'Recover'***

- ◆ **Very common for symptoms to persist for > 1 year +**
- ◆ **Diabetes most common pre-disposing risk**



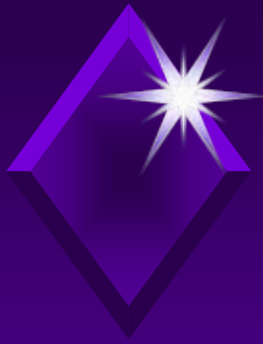
## ***What Can I Do?***

- ◆ **Try and keep diabetes under control**
- ◆ **Good foot hygiene, comfortable shoes**
- ◆ **Gloves/care when gardening/working with hands to prevent injury**
- ◆ **Report symptoms as there are medicines that can help if painful/tingling**  
(i.e.: Gabapentin, Lyrica, Nortriptylene)



# *Infertility*

- ◆ **Females:**
  - ◆ Breast/ovarian cancer, Hodgkin's lymphoma/leukemias
- ◆ **Males:**
  - ◆ Testicular cancer, Hodgkin's lymphoma/leukemias
- ◆ **Stoppage** of periods during chemotherapy: influenced by patient age
- ◆ **Resumption** of periods: mostly within 6-12 months but up to 2 years!
- ◆ Infertility in males increased in testicular cancer, pelvic radiation (rectal/prostate cancer), pre-treatment fertility



## ***Risk Factors for Chemotherapy-induced Infertility in Women***

- ◆ **Patient age**
- ◆ **Familial history of early menopause**
- ◆ **Ovarian 'reserve'**
- ◆ **History of previous pelvic/ovarian surgery or radiation**
- ◆ **Type of chemotherapy drug (i.e.: cyclophosphamide)**
- ◆ **Other diseases (i.e.: POD)**
- ◆ **Dose and duration of chemotherapy**



## ***Other Side Effects Due to Premature/Temporary Menopause***

- ◆ **Hot flashes**
- ◆ **Weight changes**
- ◆ **Sleep disturbance**
- ◆ **Sexual health/libido**
- ◆ **Bone health**



## *Myths*

- ◆ **There are treatments shown to definitely protect sperm count/ovarian function during chemotherapy**
- ◆ **There is time to discuss this issue after chemotherapy**
- ◆ **Pregnancy is contraindicated after breast cancer treatment**



## *What Can I Do?*

### ◆ Males

- ◆ Ask about sperm banking

### ◆ Females

- ◆ Few options currently/routinely available due to both absence of data as well as time constraints



# *Fatigue*

- ◆ One of the most common ‘recovery long-term’ side effects
- ◆ Multifactorially affecting everyone
  - ◆ Normal component of recovery
  - ◆ Poor sleep (hot flashes, neuropathy)
  - ◆ Stress/anxiety
  - ◆ Depression
  - ◆ Low red blood cells/thyroid function



# *Myths*

- ◆ I am the only one



## *What Can I Do?*

- ◆ Understand that recovery is highly variable
- ◆ It is **normal** to feel tired **3-6 months** after finishing chemotherapy
- ◆ Gentle escalation of activities/exercise within **your (not anyone else's)** limits
- ◆ Week by week improvements, **not day by day**
- ◆ Recognize/discuss signs/symptoms of increased **anxiety/depression**
- ◆ Discuss remedies for **hot flashes** to decrease severity
- ◆ Maintain contact/good relations with your family doctor
- ◆ **Beware of unhelpful comments**



## ***“Chemo Brain/Fog”***

- ◆ **Typically subjective**
- ◆ **Impacting short-term memory/  
concentration/word-finding**
- ◆ **Worsened by multitasking under pressure**
- ◆ **Increasingly recognized during/after  
breast cancer chemotherapy**



## ***“Chemo Brain/Fog”***

- ◆ **Poorly understood but increasingly evaluated**
- ◆ **Consequences can be significant including**
  - ◆ **Social isolation**
  - ◆ **Delay in return-to-work**
  - ◆ **Worsened stress/anxiety/depression**



## ***Multifactorial***

- ◆ ? Sleep deprivation/disturbance
- ◆ Premature menopause
- ◆ Stress/anxiety



## *Myths*

- ◆ **Chemotherapy causes brain damage**



## ***What Can I Do?***

- ◆ **Ask about it before treatment**
- ◆ **Understand that this remains an area of much controversy**
- ◆ **Identify other possible factors contributing to symptoms**
- ◆ **Advise your family/friends**
- ◆ **Proactively seek support/help with kids/tasks/organization**
- ◆ **Know that this is a temporary state of being**



## ***Bones and Joints***

- ◆ **Generalized aches and pains – ‘feeling older’**
- ◆ **Usually symmetric; large joints**
- ◆ **Usually worse in the morning or after prolonged sitting**
- ◆ **Can occur during or after chemotherapy**
- ◆ **Can last up to 1+ years**



- ◆ **Poorly understood**
- ◆ **Complicated by fatigue/sleep problems**
- ◆ **Pre-existing arthritic problems/issues very common**



## *Myths*

- ◆ **Chemotherapy damages muscles/joints/  
bone**



## *What Can I Do?*

- ◆ **Gentle weight-bearing exercise starting and advancing as tolerated**
- ◆ **Expect slow, weekly improvements**
- ◆ **Keep anxieties about cancer recurrence under control**
- ◆ **Seek out massage/physiotherapy early and often**



# ***Gains of Chemotherapy Over Past 20-30 Years***

	<b>Mortality Reduction</b>
<b>Early Stage, Pre-menopausal Breast Cancer</b>	<b>20-30%</b>
<b>Node+ Colon Cancer</b>	<b>33-40%</b>
<b>Early Stage Non-Small Cell Lung Cancer</b>	<b>30-40%</b>

	<b>Cure Rates</b>	
	<b>Pre-chemo</b>	<b>Chemo</b>
<b>Childhood Leukemias</b>	<b>0-10%</b>	<b>80-90%</b>
<b>Testicular Cancer, Metastatic</b>	<b>10-20%</b>	<b>85-90%</b>



## ***Now and the Future***

- ◆ **Maximize survival gains and minimize acute and long-term side effects**
- ◆ **Increasing incorporation of ‘non-chemotherapy’ treatments either alone or in addition to chemotherapy**
- ◆ **Continue to address and study long-term side-effects of treatments**



## ***What Can I Do?***

- ◆ **Remain an active participant in your treatment**
- ◆ **Report symptoms/problems early**
- ◆ **Recognize that every 'story' is unique**
- ◆ **Beware the unfiltered internet**
- ◆ **Seek positive support/help early on**



## ***More Information***

◆ [chemocare.com](http://chemocare.com)

◆ [www.youngadultcancer.ca](http://www.youngadultcancer.ca)



