

What is chemotherapy and where did it come from?

- ◆ Drugs or medicines that disrupt cells that are growing
- ◆ Cells know when to grow and divide and even know when to die
- ◆ Normal cells know how to respond to injury
- ◆ Cancer cells are growing more erratically and recover from injury less well

What is...

- ◆ Therapeutic window

What is chemotherapy and where did it come from?

- ◆ Nitrogen mustard
- ◆ Early chemotherapy drugs – alkylating agents – alkeran, leukeran, chlorambucil
- ◆ Improvements Cytosin
- ◆ Methotrexate, fluorouracil
- ◆ Other agents Adriamycin

What is...

- ◆ Platinum
- ◆ Taxanes
- ◆ Others.....

Why do we give chemotherapy?

- ◆ Chemotherapy is systemic therapy.
- ◆ Goes through the blood stream
- ◆ Most cancer cells can travel through the blood stream, so chemo follows this flow
- ◆ Doesn't reach the CNS - the brain

When do we give chemotherapy?

- ◆ Curative therapy (not for breast cancer)
- ◆ Adjuvant therapy
- ◆ Palliative therapy

When..

- ◆ Adjuvant therapy given after a surgical procedure to help with any microscopic cancer left behind; e.g. Breast cancer, colon cancer, ovarian cancer, sometimes lung cancer
- ◆ Neoadjuvant therapy - same therapy generally but given BEFORE the surgery

microscopic

- ◆ 1 2 4 8 16 32 64 128 256
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- ◆ 30 doubling times > 1 billion cells
- ◆ 1 billion cells in the same place at the same time 1 cm

When

- ◆ Palliative chemotherapy For metastatic breast cancer
- ◆ Bad term
- ◆ Really means Noncurative
- ◆ Designed to cause a remission of the disease (or sometimes a stabilization) that is evident.

What are the toxicities?

- ◆ Is treatment really worse than the disease?
- ◆ Poison?

Toxicities

- ◆ Those cells which are dividing quickly are often susceptible to chemo side effects
- ◆ Hair follicles
- ◆ Blood Cells

Toxicities...

- ◆ Nausea
- ◆ Neuropathy
- ◆ Immune System
- ◆ Cardiac
- ◆ GI tract - diarrhea

How do we know what to give?

- ◆ Clinical trials
- ◆ NCI sponsored
- ◆ Guidelines IRB
- ◆ Cancer Centers Industry
- ◆ NSABP ECOG SWOG

Clinical Trials Examples

- ◆ NSABP B 4 mastectomy vs lumpectomy
- ◆ NSABP B 9 chemotherapy followed by Tamoxifen vs placebo
- ◆ NSABP B 24 DCIS Tamoxifen/placebo
- ◆ NSABP B 33 Tamoxifen followed by Exemestane vs placebo
- ◆ JMA 17

Hormonal therapy

- ◆ Treating cancer systemically by giving an antiestrogen

Estrogen receptor

- ◆ Proteins that “receive” estrogen; that combination helps promote growth of cell
- ◆ About 70% of breast cancer cells also have estrogen receptors
- ◆ Those breast cancers are called Estrogen Receptor positive cancers
- ◆ A CHARACTERISTIC OF THE CANCER

Estrogen receptor...

- ◆ 2 implications for an ER positive cancer
- ◆ 1. Antiestrogen therapy can be used
- ◆ 2. Prognostically, these cancers are less aggressive
- ◆ (Progesterone)

Hormonal therapy

- ◆ Old days ovary removal male hormone
- ◆ Now ovary removal
- ◆ Tamoxifen
- ◆ AI (anastrozole, femara, aromasin)
- ◆ Fulvestrant

Herceptin

- ◆ A targeted therapy

Targeted therapy

- ◆ What is a targeted therapy?

HER 2

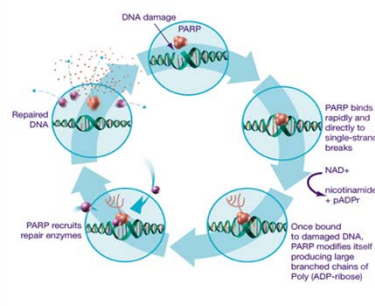
- ◆ Normal cells do not overexpress HER 2
- ◆ A growth factor receptor
- ◆ About 25% of Breast Cancers will overexpress (amplify) this receptor; these are more aggressive cancers generally
- ◆ Herceptin (trastuzumab) and anti HER 2

PARP Inhibitors

- ◆ A targeted therapy
- ◆ The target is PARP
- ◆ PARP (poly adp ribose polymerase) is the name of an enzyme
- ◆ A DNA repair enzyme
- ◆ DNA constantly replicating – sometimes, making errors as it goes along

PARP

- ◆ Usually this is a good thing
- ◆ In a cancer cell however, we sometimes intentionally try to interfere with DNA
- ◆ If the DNA can repair itself, our chemo isn't effective
- ◆ Giving a PARP Inhibitor along with our chemo might be a good strategy



Avastin

- ◆ Bevacizumab
- ◆ A targeted therapy that is FDA approved for colon, lung, kidney and brain cancers
- ◆ Had been approved for breast cancer but lost that approval
- ◆ An anti-VEGF (vascular endothelial growth factor) – anti angiogenesis agent

Avastin

- ◆ Bevacizumab
- ◆ Studies didn't show a survival benefit when chemo for metastatic cancer was given along with Avastin

What is on the horizon?

- ◆ Not too many new chemo drugs
- ◆ Newer targeted therapies
- ◆ Newer delivery systems
- ◆ Refining subgroups – Oncotype
- ◆ Understanding genetics - BRCA
- ◆ Understanding the biology

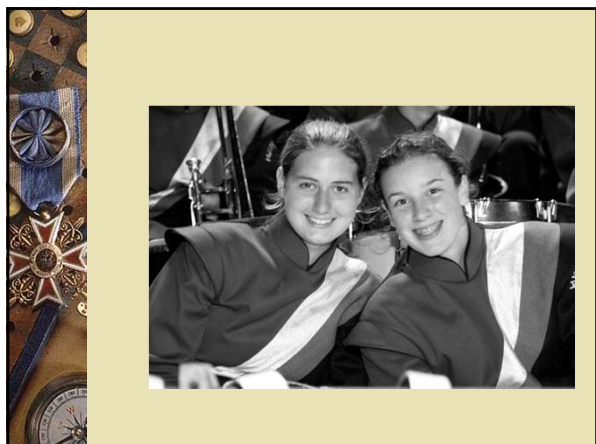
So many other issues

- ◆ Bone marrow transplant?
- ◆ Circulating tumor cells?
- ◆ Phytoestrogens?
- ◆ What Dr Oz said?
- ◆ on and on and on



LET'S CURE THIS

- ◆ Before our daughters have to deal with it!!



YOU ARE NEVER ALONE

- ◆ When you are facing breast cancer...

Thank you

- ◆ Questions?