

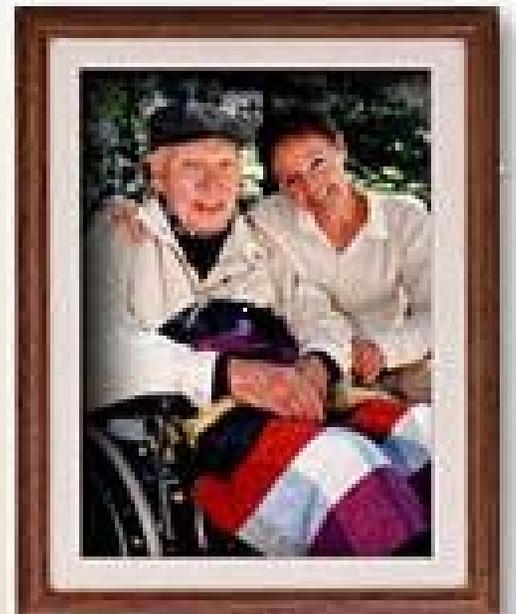


# **Caregivers' burden and its implications for caregivers' and patients' health**

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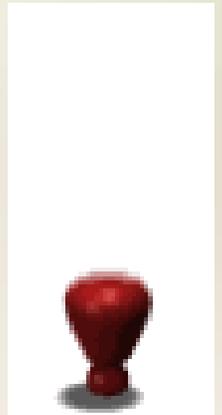
## Definition of Caregiving

- Caregivers are defined as 'primary care providers', often referring to network members, such as the partner, parent, sibling or child.
- Caregiving includes objective and subjective components of care



## **Objective care refers to care tasks:**

- **Instrumental care**
- **Assuming new responsibilities, roles and duties formerly done by the patient**
- **Providing the patient with emotional support**
- **Attending to patient's care needs**
- **Treatment management**



# The subjective experience of caregiving

- **Psychological burden of continuous caring, often not leaving time to care for themselves.**
- **Awareness of the threat to patient's life and well-being.**
- **Stress of witnessing pain and suffering of their beloved one, the patient.**
- **Feelings of helplessness**
- **Loss of companionship or support from the patient.**



- **Caregiving often continues for long periods.**
- **The enormous tasks, emotional strains and changes that take place in caregivers' lives act altogether as severe and continuous stressors.**



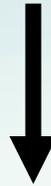
- **Caregivers experience high levels of psychological distress.**
- **High levels of depression, anxiety, and hopelessness were found in long-term caregivers.**
- **Psychological distress is at a level similar to or even higher than that of the patients themselves (Baider & Kaplan De-Nour, 2000).**

- **Caregiving stress has been found to impact caregivers' psychological and physical health.**
- **Caregivers are the "hidden patients"**
- **Studies have found higher rates of**
  - **Cardiovascular diseases**
  - **Metabolic diseases**
  - **Upper respiratory infections**
  - **Mortality risk**



# Immune functions in caregivers

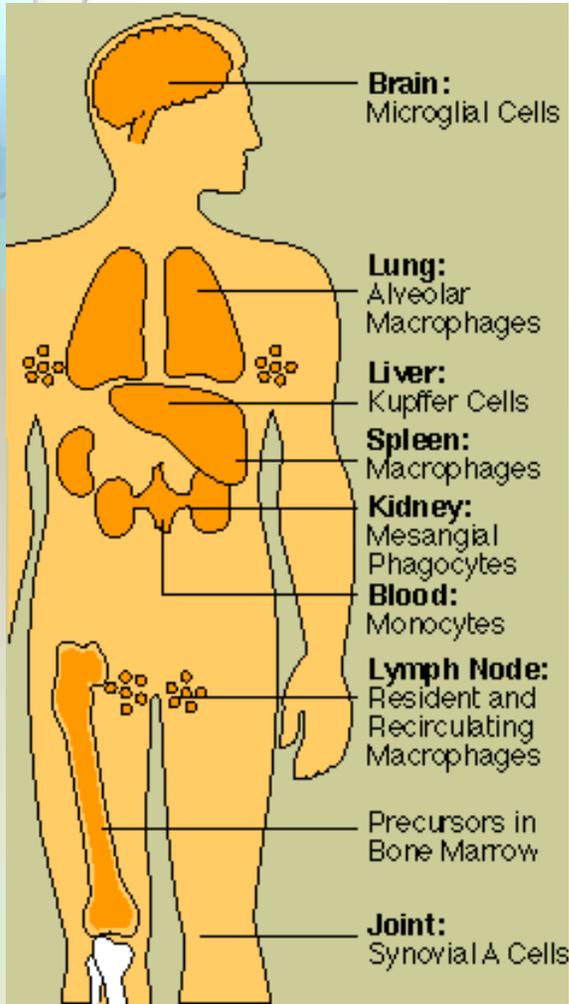
# The immune system



**Cells**

**Cytokines**

## Immune organs

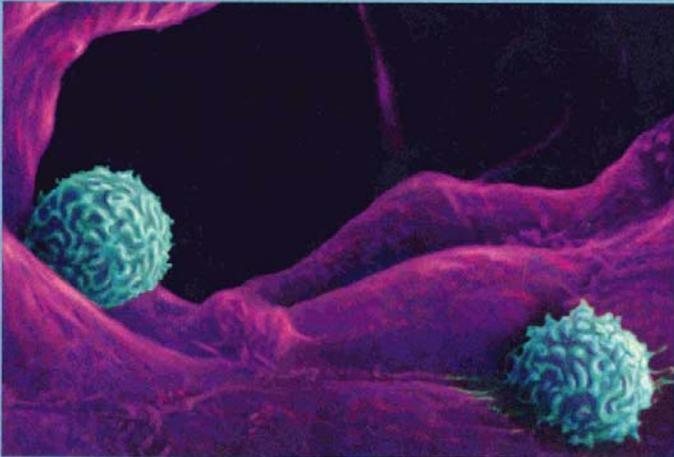


# Immune Cells

Monocytes, Granulocytes,  
dendritic cells....

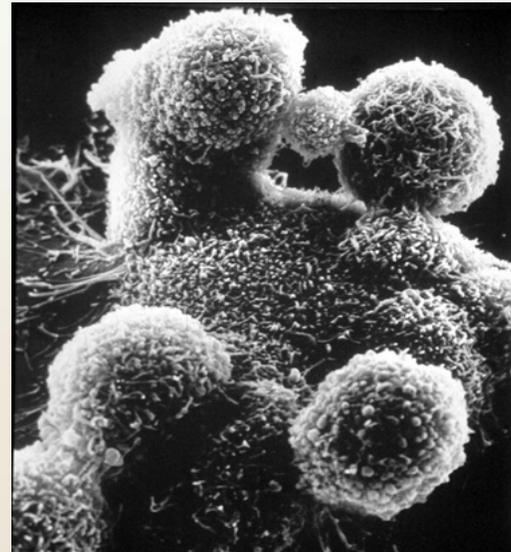
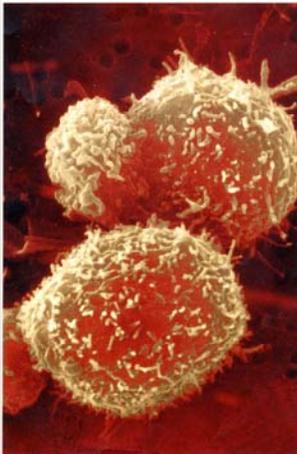
## Lymphocytes

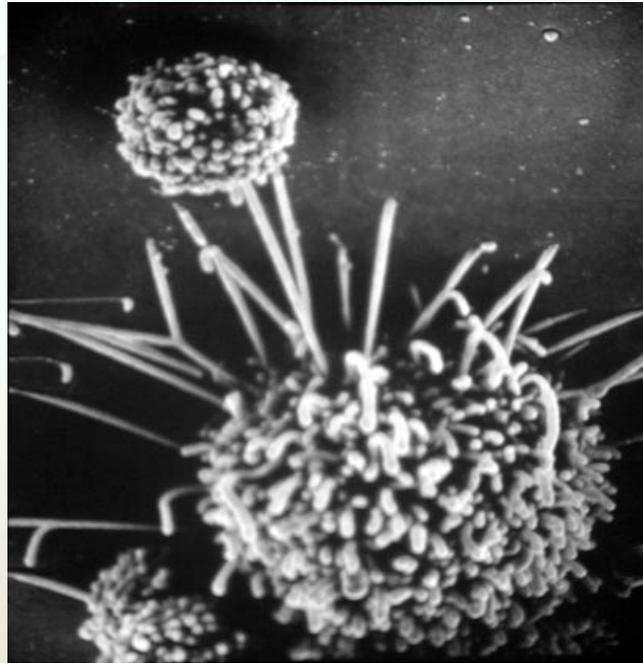
- T cells (helper and cytotoxic)
- B cells
- Natural killer cells

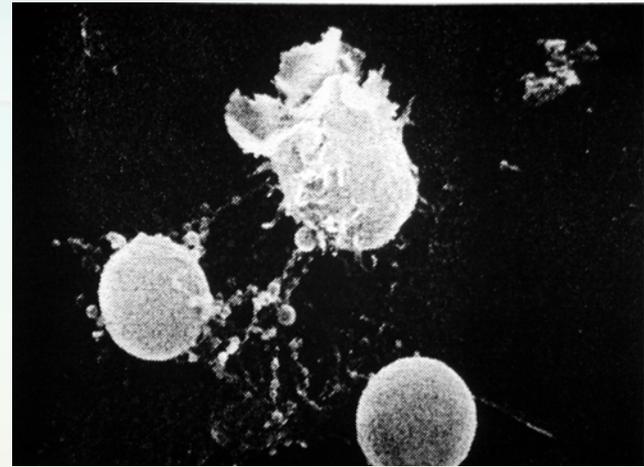
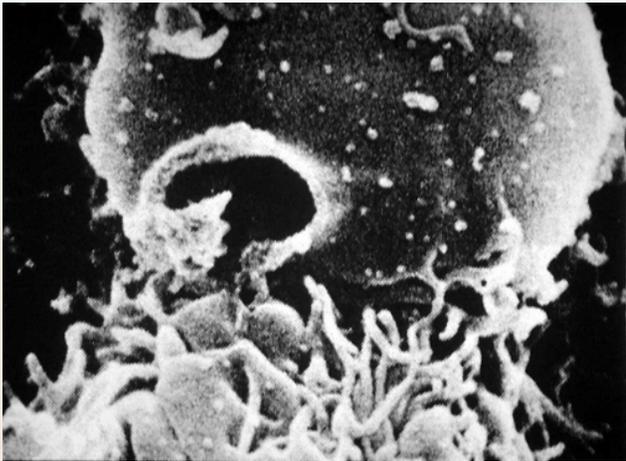


✓ **Natural killer cells perform immune surveillance to detect viral infected cells and cancerous cells.**

✓ **They destroy these cells and prevent further cancer development.**

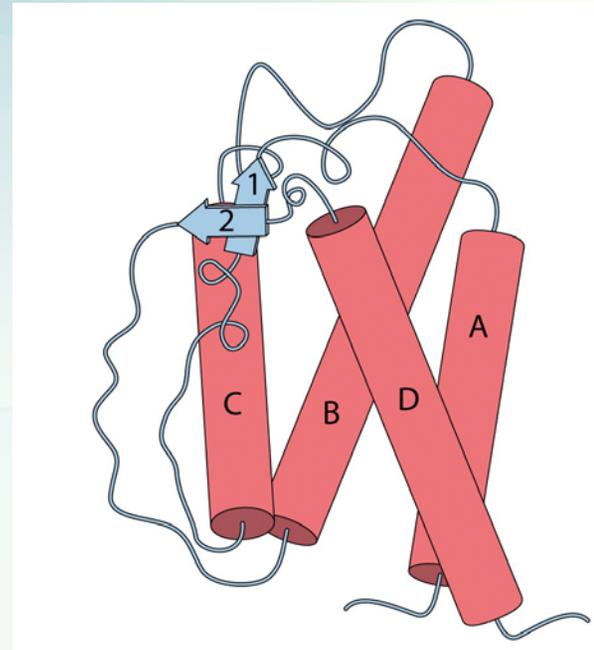






## Cytokines

- **Cytokines are chemical messengers that control immune responses.**
- **They are secreted mainly by immune cells.**



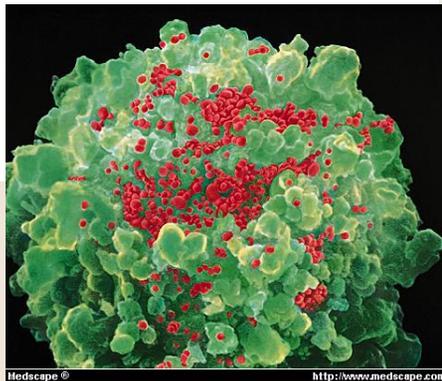
# Th1/Th2 balance

Th1

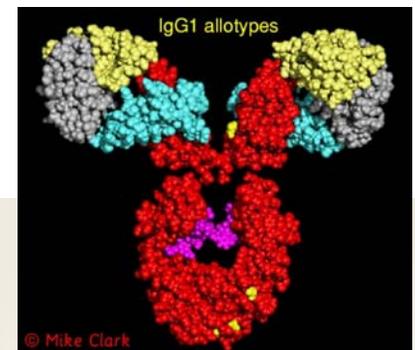
Th2



**Cellular immunity:**  
Directs Natural Killer  
and T cells to attack  
abnormal cells and  
microorganisms  
at sites of infection  
inside  
the cells.

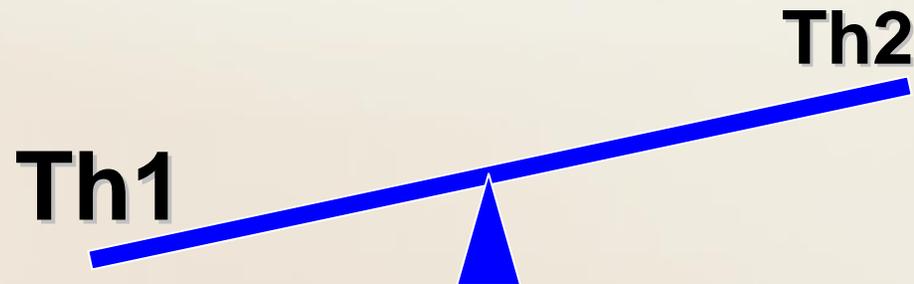


**Humoral immunity:**  
Directs production  
of antibodies used  
to  
neutralize foreign  
invaders and  
substances  
outside  
the cells



**Cytokines can be grouped into those secreted by Th1 type cells and those secreted by Th2 type cells.**

- **A healthy immune system is both balanced and dynamic:**
- **It should be balanced between Th1 and Th2 activity.**
- **Inability to make an adequate Th1 response can result in infections and many types of diseases.**
- **An overactive Th2 response plays a part in autoimmune diseases.**



## Chronic stress

- Impairs Th1 functions:
- Low production of Th1 cytokines.
- Impaired T cells functions and natural killer activity.
- Upregulates Th2 cytokines production



## Immune functions in caregivers

- **Several studies have shown lower cytotoxic immune functions in elderly persons who care for spouses with Alzheimer's disease (Cohen et al., 2003; Kiecolt Glaser et al., 1994):**

- **Lower secretion of Th1 cytokines:**
  - **Interleukin 2 (IL-2)**
  - **Interferon-gamma (IFN-g)**
- **Reduced reaction to flu vaccination**
- **Lower Natural Killer Activity**



## **Adult daughters of breast cancer patients**

- **Are exposed to multidimensional stressors.**
- **Tend to assume the role of main caregivers.**
- **Experience conflicts between their roles as mother and wife and as caregiver.**
- **They cope with the threat to mother's life.**
- **They face their own increased chances of breast cancer due to possible familial risk.**

- **Daughters of breast cancer patients were found to have reduced natural killer cytotoxic activity (NKCA).**



- ✓ **Most cancer cells are resistant to NK cells.**
- ✓ **Only when augmented by the secretion of Th1 Cytokines (IL-2, IL- 12, INF- $\gamma$ ), NK cells can perform the killing of cancerous cells.**

# **Immune surveillance functions in daughters of breast cancer patients**

## **AIMS**

**To characterize the psychological status, immune surveillance functions and stress hormones levels in daughters.**

**To correlate the psychological status of daughters with immune surveillance functions and stress hormone levels in daughters.**

## Participants

- ✓ **39 daughters whose mothers were found to have primary localized breast cancer one year prior to the beginning of the study.**
- ✓ **41 daughters whose mothers were found to have recurrent (localized or metastatic) disease one year prior to the beginning of the study.**

## Controls

- ✓ **47 women, matched for age, and socio-demographic characteristics, whose mothers were healthy and did not suffer from cancer in the past.**

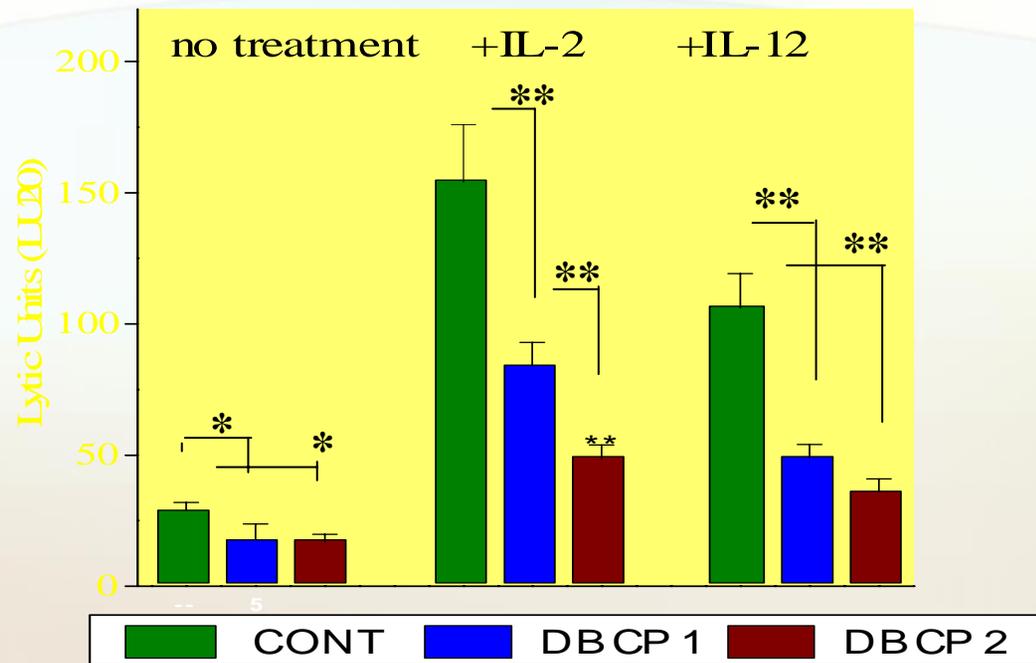
### **Excluded:**

- ✓ **Chronic illness, allergy, infectious or viral diseases, pregnant women or women receiving fertility treatment.**

## Results

- ✓ **Daughters expressed higher levels of emotional distress than controls.**
- ✓ **Epinephrine, norepinephrine and cortisol levels were significantly higher in daughters than in controls.**

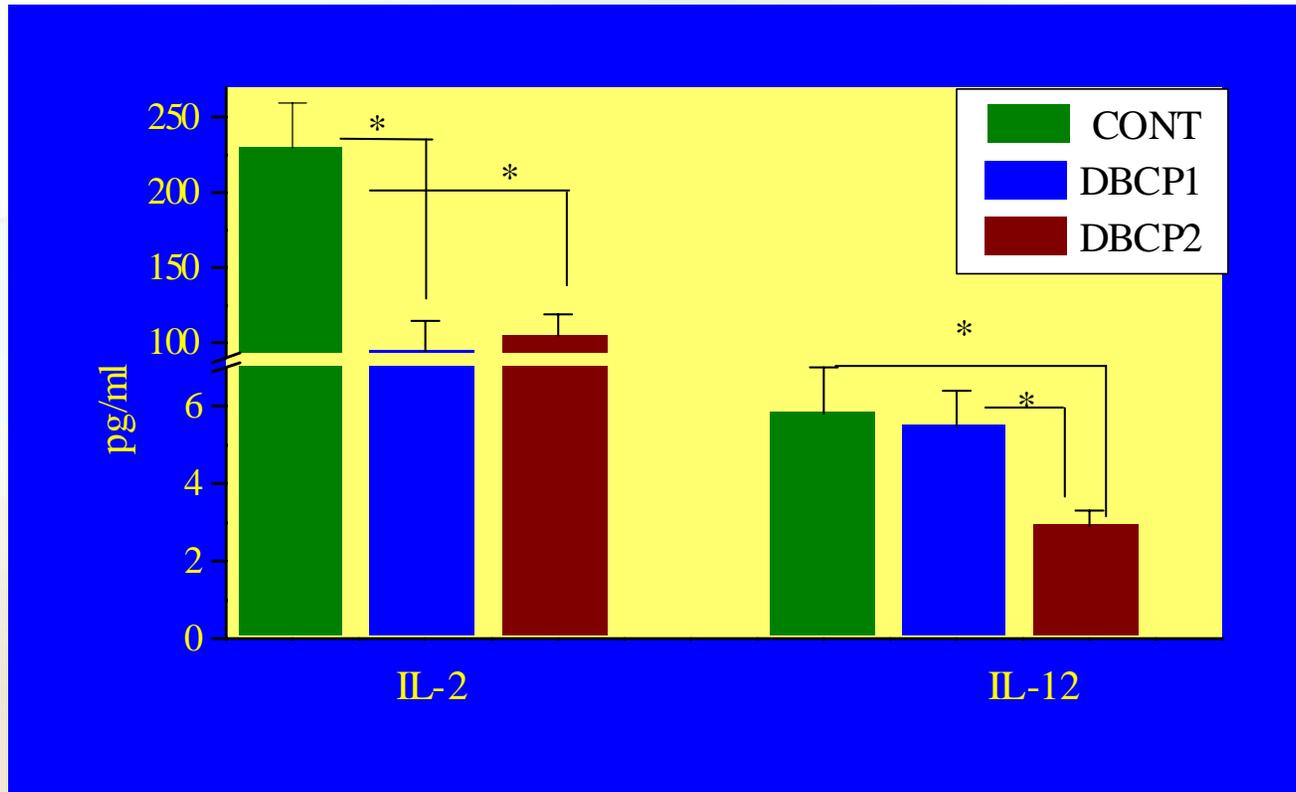
# Effect of pre-incubation with IL-2 or IL-12 on cytotoxic activity against MCF7 cells



\*p<.05 \*\*p<.01

NKCA expressed in lytic units (LU)

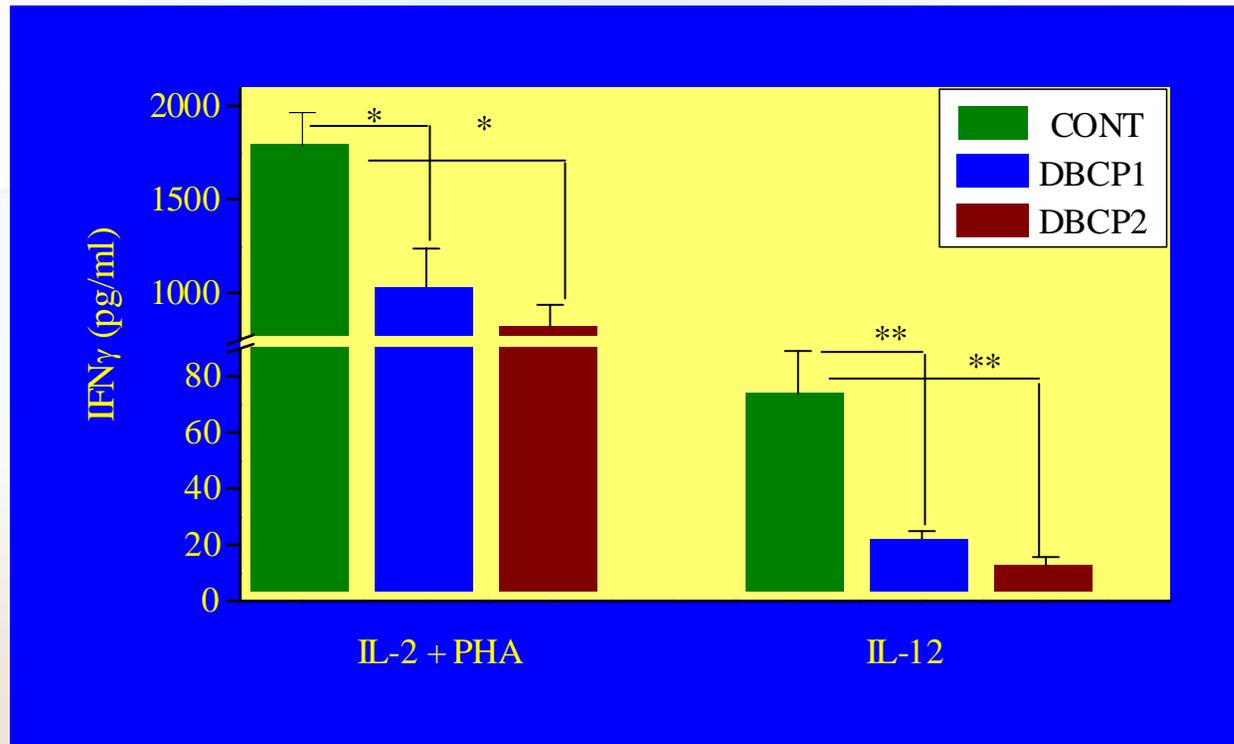
## IL-2 and IL-12 secretion by mononuclear cells in peripheral blood



\* P < .01

**IL-2 and IL-12 secretion is significantly lower in daughters than in controls**

## IFN $\gamma$ secretion by mononuclear cells in peripheral blood



\* P < .05 \*\* p < .01

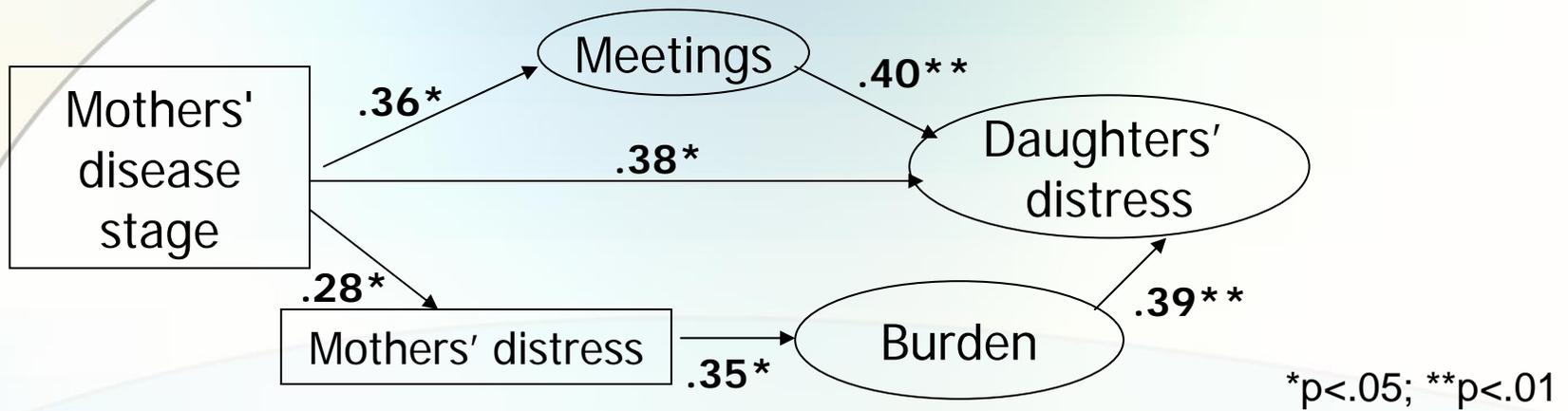
IFN $\gamma$  secretion from T lymphocytes (stimulated by IL-2 + PHA) and from NK cells too (stimulation with IL-12) was lower in daughters than in controls

**Natural killer activity, cytokine secretion and level of stress hormones was associated with level of psychological distress and sense of helplessness.**



**The relationship between  
mothers' reaction to breast cancer and their  
daughters' emotional and  
neuro-immune status**

**Cohen & Pollack, 2005**



- Mothers' more advanced disease was associated with higher distress in daughters.
- More advanced disease was associated with more frequent meetings of daughters.
- Frequency of meetings mediated the relationship between stage of disease and daughters' emotional distress.
- Perceived burden of care mediated the relationship between mothers' and daughters' distress.

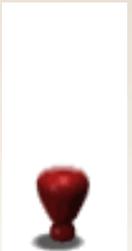
# Cognitive-behavior group intervention for Relatives of cancer patients

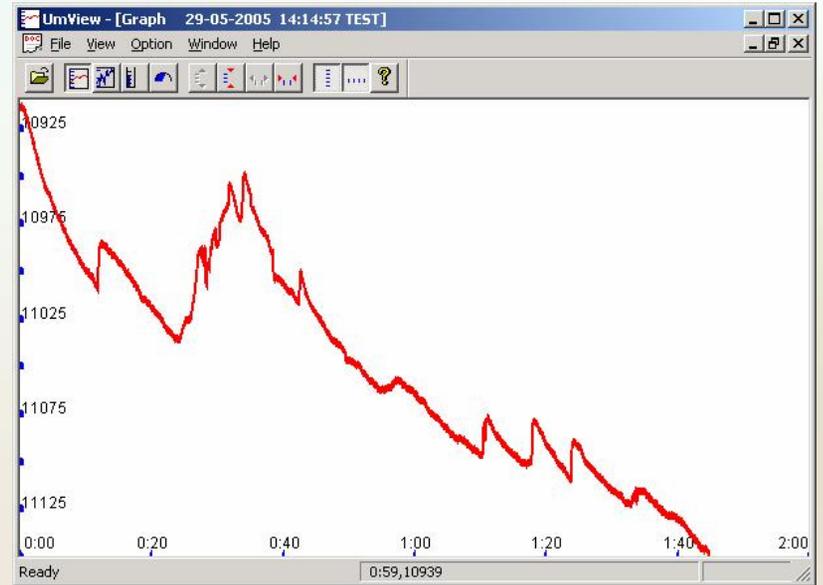


Cohen M. & Kuten A. J Psychosom Res, 2006

## **Group cognitive-behavior principles:**

- ✓ **Identifying distress-creating thoughts and replacing them with more adaptive thoughts.**
- ✓ **Learning new coping strategies.**
- ✓ **Anxiety-reduction techniques.**
- ✓ **Relaxation and guided imagery techniques.**





## Participants

- ✓ **Family members of cancer patients.**
- ✓ **Receiving chemotherapy or radiotherapy.**

## **Intervention Group**

**Eight groups, 52 participants**

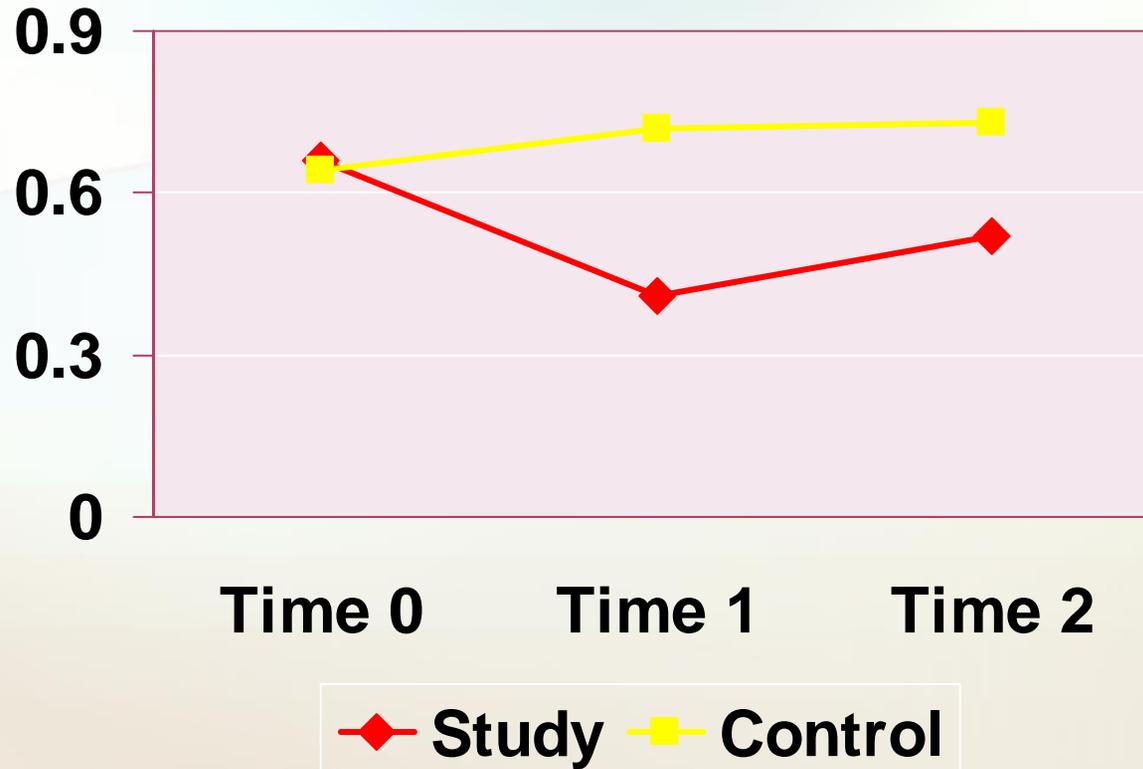
**6-10 participants in each group**

- **9 meetings**
- **Each meeting duration 90 min.**

## **Control group**

**52 participants completed the study**

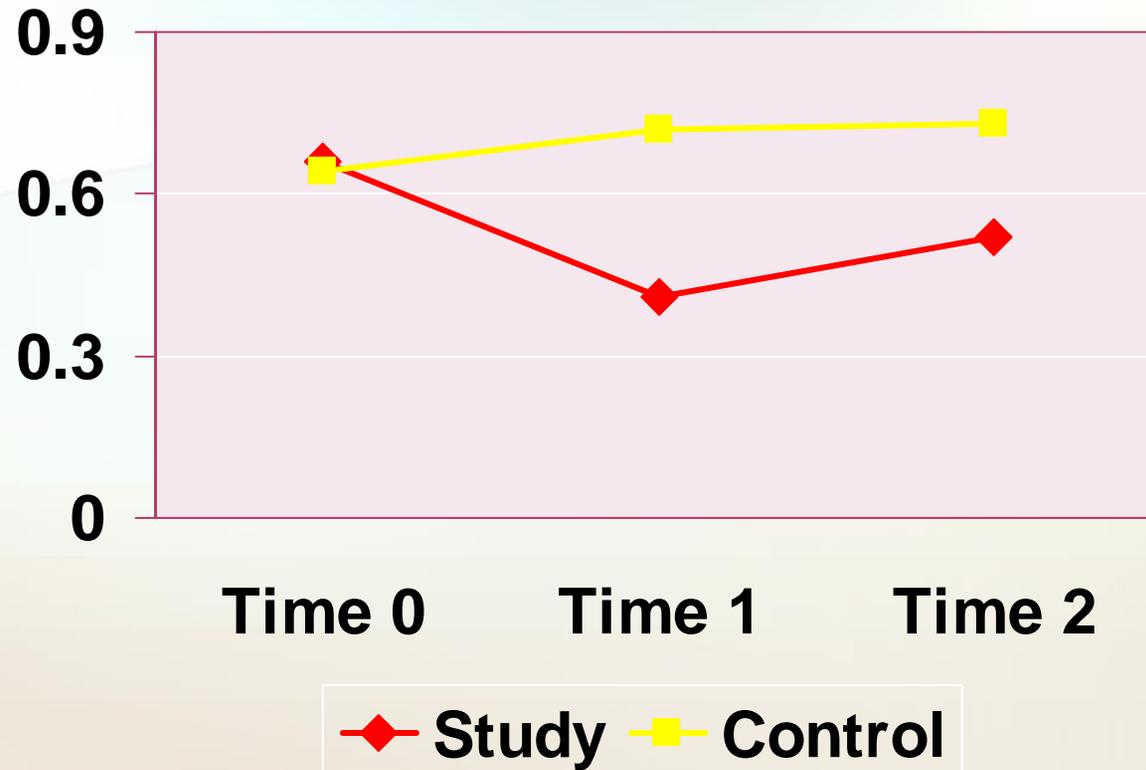
## Level of distress



$R^2 = 0.43$

Significant difference by group  $F=9.0$ ,  $p < .01$  and by group x time ( $F=21.7$ ,  $p < .001$ )

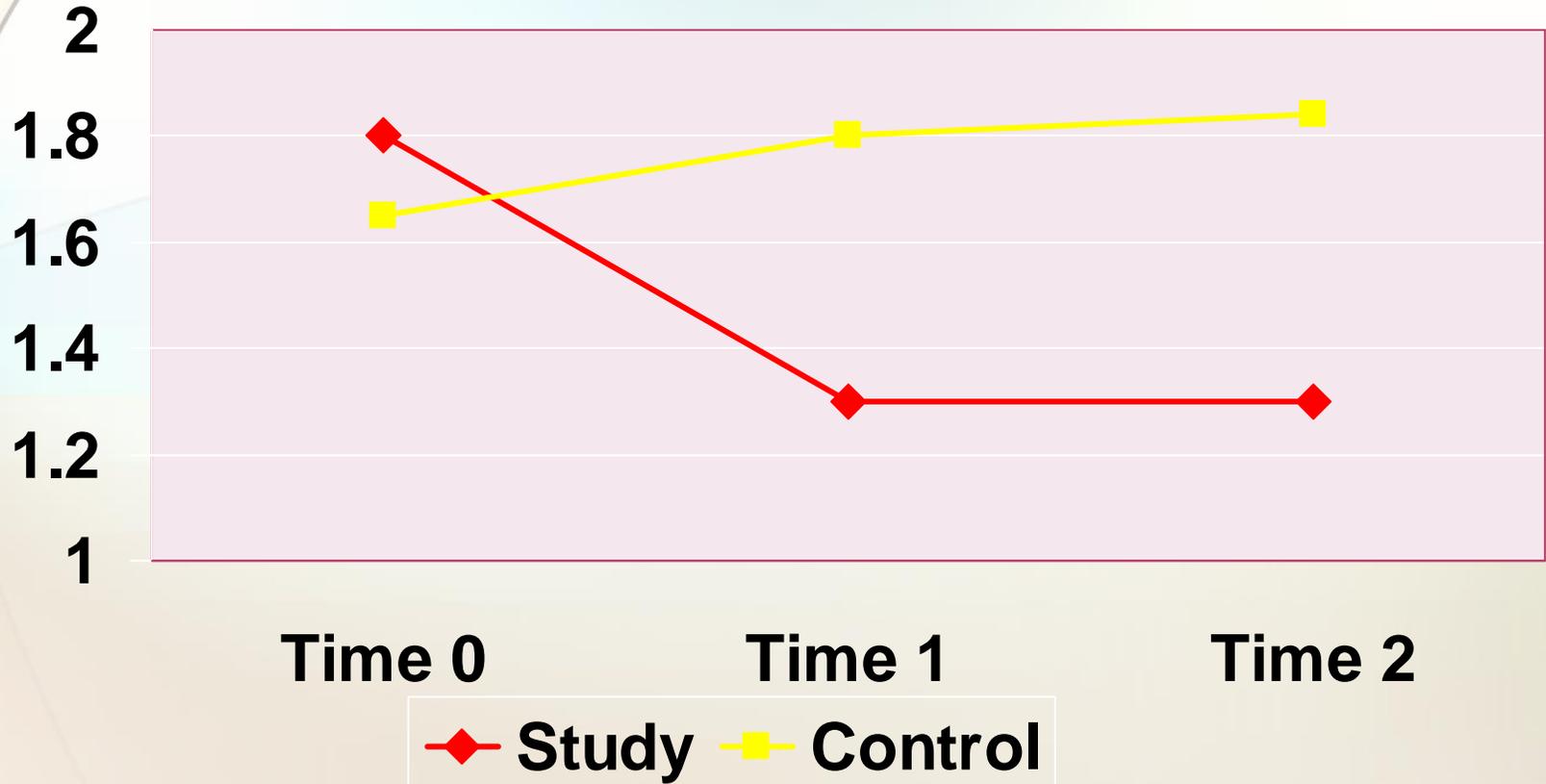
# Psychological adjustment problems



$R^2 = 0.35$

Significant difference by group ( $F= 4.5, p<.05$ ) and by group x time ( $F= 11.5, p<.001$ ).

# Sleep difficulties



$R^2 = 0.48$

Significant difference by group ( $F=4.9, p < .05$ ) and by group x time ( $F=11.6, p < .001$ )

## Conclusions

- **Caregiving for cancer patients is a stressful experience.**
- **It may have long-term effects on caregivers' psychological and physical health.**
- **Caregiving stress may impair immune functions.**
- **It may decrease ability to care for the patient.**
- **Interventions for caregivers may help to preserve caregivers' and patients' psychological and physical health.**

Thank  
You!

