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Cancer Diets
Facts or Fantasy ?

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Cancer Diets
Facts or Fantasy ?

Summary

1. What changes in cancer patient's metabolism?
2. Antineoplastic treatments
3. Consequences of therapy
4. Solutions...

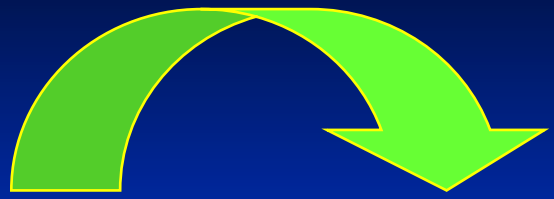
Cachexia (Kakos + Hexis)

Progressive & Involuntary Weight Loss

- Wasting
- Muscle mass atrophy
- Anergy
- Anaemia
- Hypoalbuminaemia
- Anorexia
- Weakness

Ottery, 1995
Ottery, 1997

Cancer Cachexia



Results from complex & multifactorial causes:

- Sub-optimal food intake
- Malabsorption
- Metabolic Changes

Makes the Cancer Patient Different

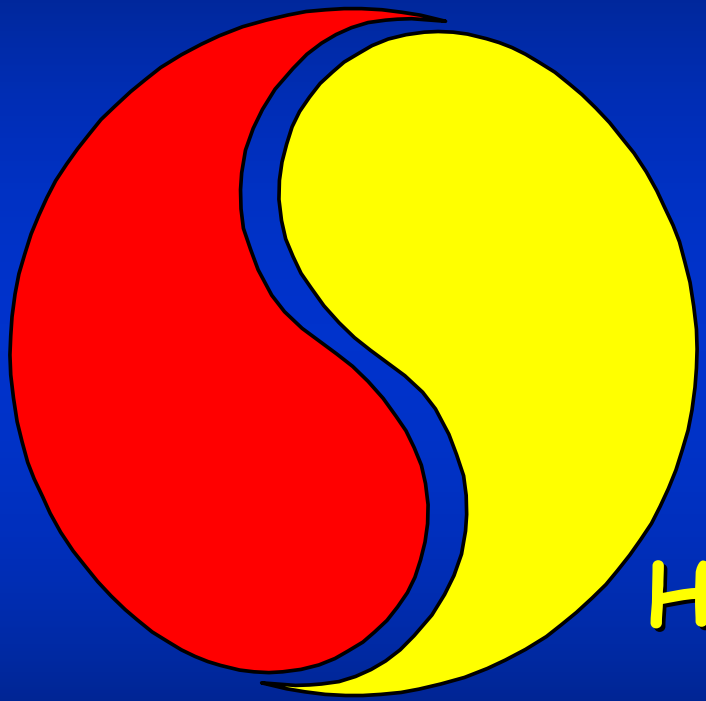
Sub-optimal Food Intake

- **Anorexia**
  - Taste problems
  - Serotonine (?)
  - Leptine (?)

- **Satiety**
  - Mucosal atrophy
  - Reduced GI Motility
  - Abdominal distension

Metabolic Changes

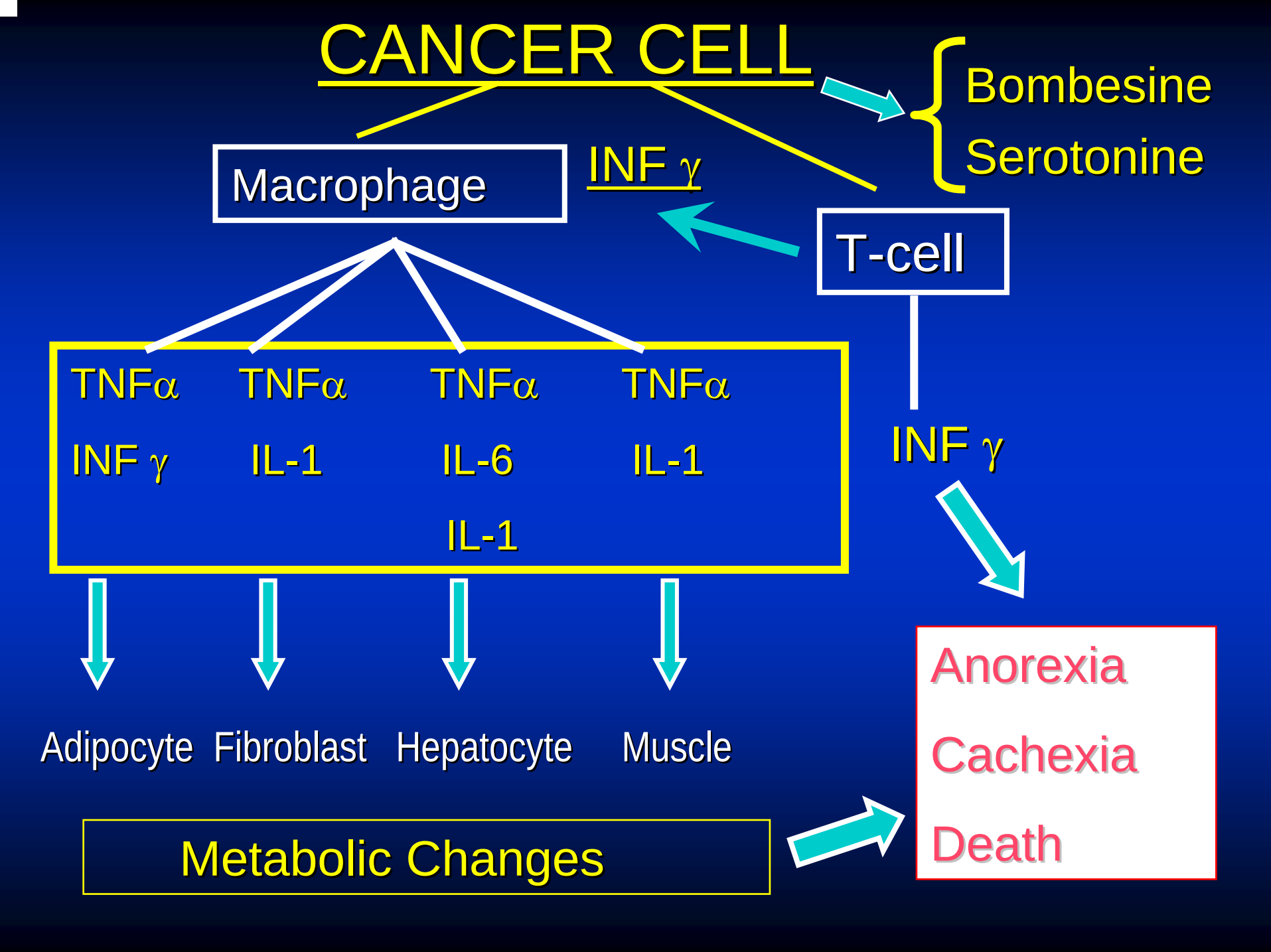
TUMOUR



HOST

Immune response

Cytokines


CANCER CELL
Bombesine
Serotonine
Macrophage
INF γ
T-cell
TNFα
INF γ
TNFα
IL-1
TNFα
IL-6
IL-1
TNFα
IL-1
INF γ
Adipocyte
Fibroblast
Hepatocyte
Muscle
Anorexia
Cachexia
Death
Metabolic Changes

Cachexia – metabolic causes

Cytokines

- TNFα
- IL-1
- IL-6
- IFγ

+

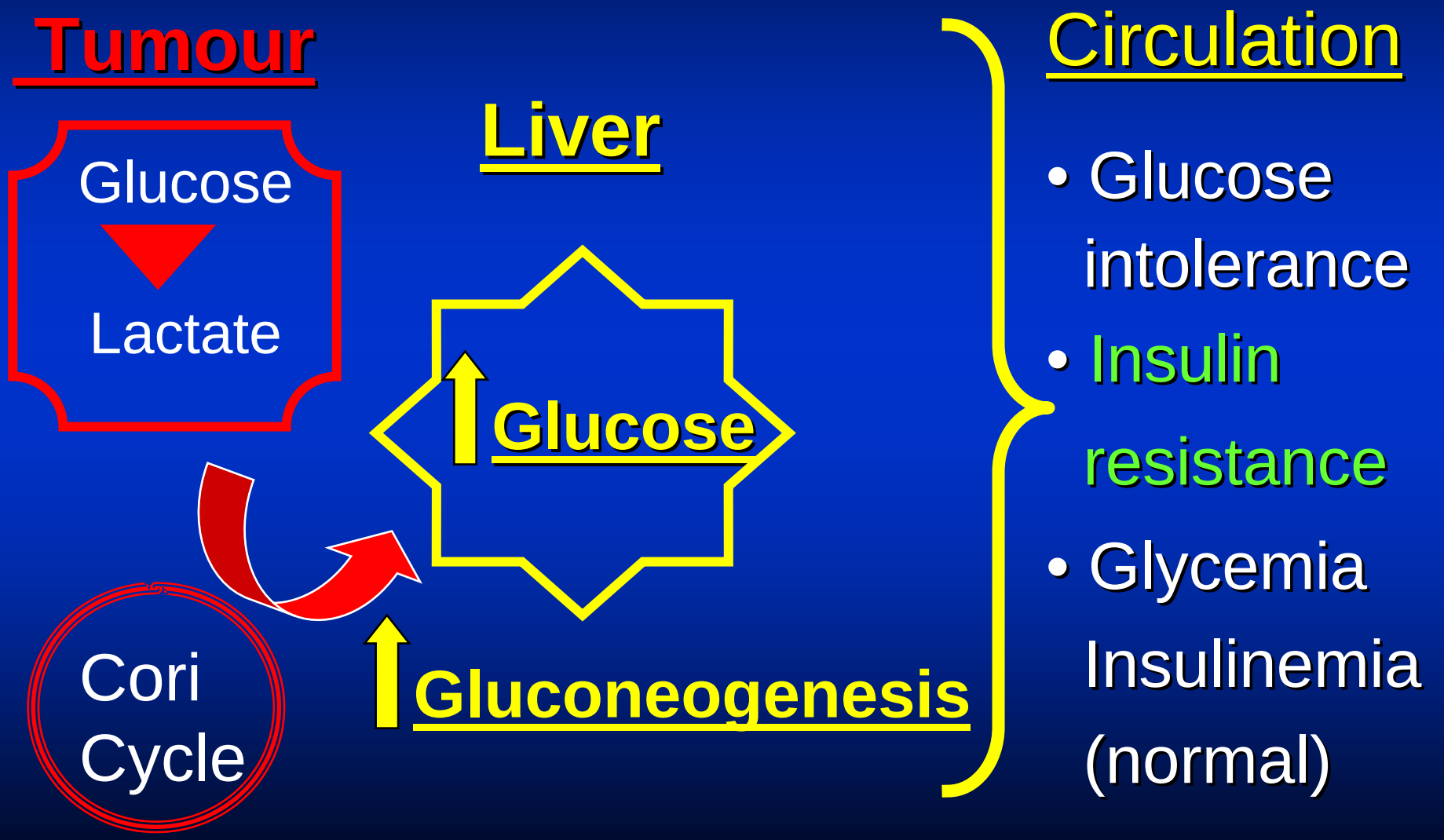
Circulating Factors

- LMF (lipid mobilizing factor)
- PMF (protein mobilizing factor)

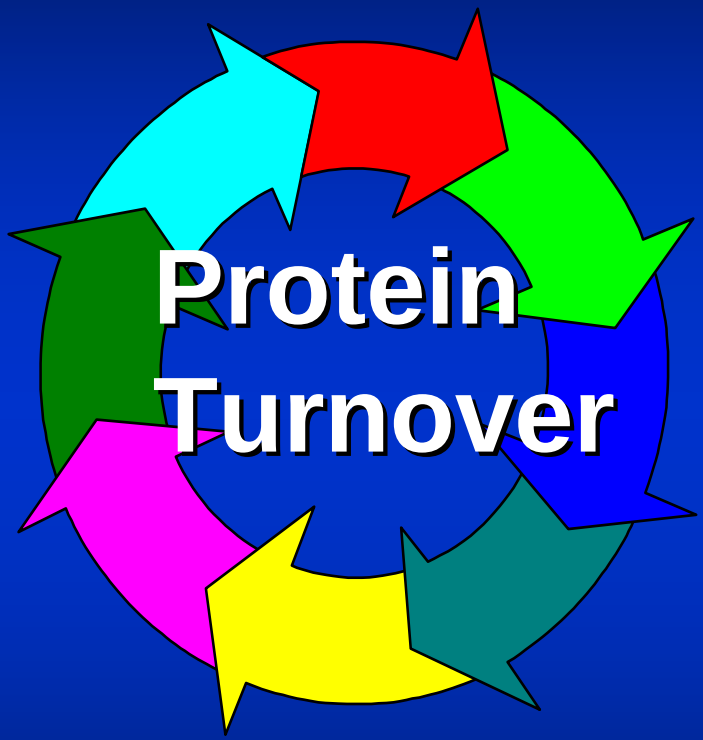
State of **Chronic Inflamation**

Abnormalities in CH, protein & lipid metabolism

Glucose


Tumour
Glucose
Lactate
Liver
Glucose
Cori Cycle
Gluconeogenesis
Circulation
• Glucose intolerance
• Insulin resistance
• Glycemia
Insulinemia (normal)

Protein



++ Muscle Protein Catabolism
-- Muscle protein synthesis

++ Liver Protein Synthesis

Negative Nitrogen Balance

32 a 35%

No reduction in UN excretion

Lipids

↑ Lipolysis
FA synthesis

↓ LPL
Lipogenesis

IL1
INF γ

Lipid oxidation non-inhibited by glucose

? Carnitine

++ Plasma lipids

Metabolic Profile Cancer Patient

- (-) Energy balance
  - Anorexia and/or hypophagia
- Hypermetabolism
  - (+) Cori cycle
  - CH intermediates → lipogenetic pathways
  - (+) Protein turnover
  - (+) Plasma lipids

Cancer Cachexia

Cachexia - consequences

- Clinical
  - Prognosis
  - Morbidity
  - Mortality
- Economical
  - Hospital stay
  - Costs

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Oncology Treatments

- **Surgical**
- **Medical**
  - Chemotherapy
  - Radiotherapy
  - Bone Marrow Transplant (BMT)
  - Palliative Care

Surgical Oncology

SITE	NUTRITIONAL CONSEQUENCES
Tongue or pharynx	Dysphagia – liquid oral or enteral
Oesophagus	Vagotomy – Gastric stasis, fat malabsorption
Stomach	Dumping (?), anaemia, fat malabsorption,
Duodenum	Biliary-pancreatic insuficiency
Jejunum (≤120 cm)	(-) absorption Glucose, fats, protein, folic acid,Vit B12...
Ileum (60 cm)/ileo-cecal valve	Malabsorption Vit B12, bile salts and fats
Small bowel (75%)	Malabsorption VitB12, biliary salts and fats
Jejunum & ileum	Complete malabsorption
Colon (subtotal/total)	Water and electrolytes loss
Pancreas	Malabsorption and Diabetes
Liver	Transient hypoalbuminaemia

Medical Oncology - Chemotherapy

Type	NUTRITIONAL CONSEQUENCES
Liquid tumours	Mucositis; Odynophagia; GI disturbances Food allergies.
BMT	HVGD; Mucositis; Oesophagitis; GI problems Xerostomia; Changes in taste
Palliative care	Xerostomia; Bloating; GI disturbances Hypercalcaemia

Medical Oncology - Radiotherapy

REGION	EARLY EFFECTS	LATE EFFECTS
Head & Neck 	Odynophagia Xerostomia Mucositis Anorexia Dysosmia Hypogeusia	Ulceration Xerostomia Dental caries Osteoradionecrosis Trismus Hypogueusia
Thorax	Dysphagia	Fibrosis, Stenosis, Fistula
Abdomen & Pelvis 	Anorexia Nausea Vomiting Diarrhoea Acute enteristis Acute colitis	Ulceration Malabsorption Diarrhoea Chronic enteritis Chronic colitis

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Mucositis/ Odynophagia /Oesophagitis

- Frequent meals
- (+) Protein-calorie content
- Cold or at room temperature
- *Soft/wet foods*
- Cooking with or adding sauces
- Avoid seasoned or acidic foods

Xerostomia

- (+) *Fluid intake*
- Soft & wet foods
- *Addition of sauces*
- Sour candy/crushed ice

Anorexia/ Early satiety

- Frequent meals
- Re-enforce the early meals
- (+) *Protein/calorie content*
- Limit fluid intake
- Avoid fatty foods
- Eat in pleasant environment

Radiation enteritis

- Frequent meals
- *Supplement with fermentable fiber*
- (+) *Protein-calorie content*
- Cold or at room temperature
- *Avoid seasoned or acidic foods*

SOLUTIONS...

Cancer Patients

- Malnutrition
- Imunodepression
- Chronic inflamation
- Metabolic abnormalities

Options Available

- Clinical Nutrition Approach
  - Nutritional therapy
    - » Comfort Foods
    - » Oral supplements
    - » Enteral / Parenteral nutrition
- Alternative approaches
  - Cancer diets
  - Complementary & alternative therapies

Clinical Evidence

Nutrition Therapy

- McWhirter & Pennington, 1994
- McWhirter & Pennington, 1996
- Rana et al., 1992
- Delmi et al. 1990
- Carver et al. 1995
- Power, 1999
- Ravasco P et al, 2003
- Davidson W et al., 2004

Substrate Modulation

- Klein & Koretz, 1994
- Stratton & Elia, 1999
- Barber et al. 1999
- Stratton R, 2000
- Fearon K, 2001
- Berger M, 2005

Alternative cancer diets

Complementary and alternative therapies

Special diets

- Macrobiotic – no evidence
- Gerson's - harmful

Bromelain - 1 small study Germany boost imune system

Essiac – no evidence

Laetrile – no evidence

Shark cartilage – no evidence

Complementary and alternative therapies

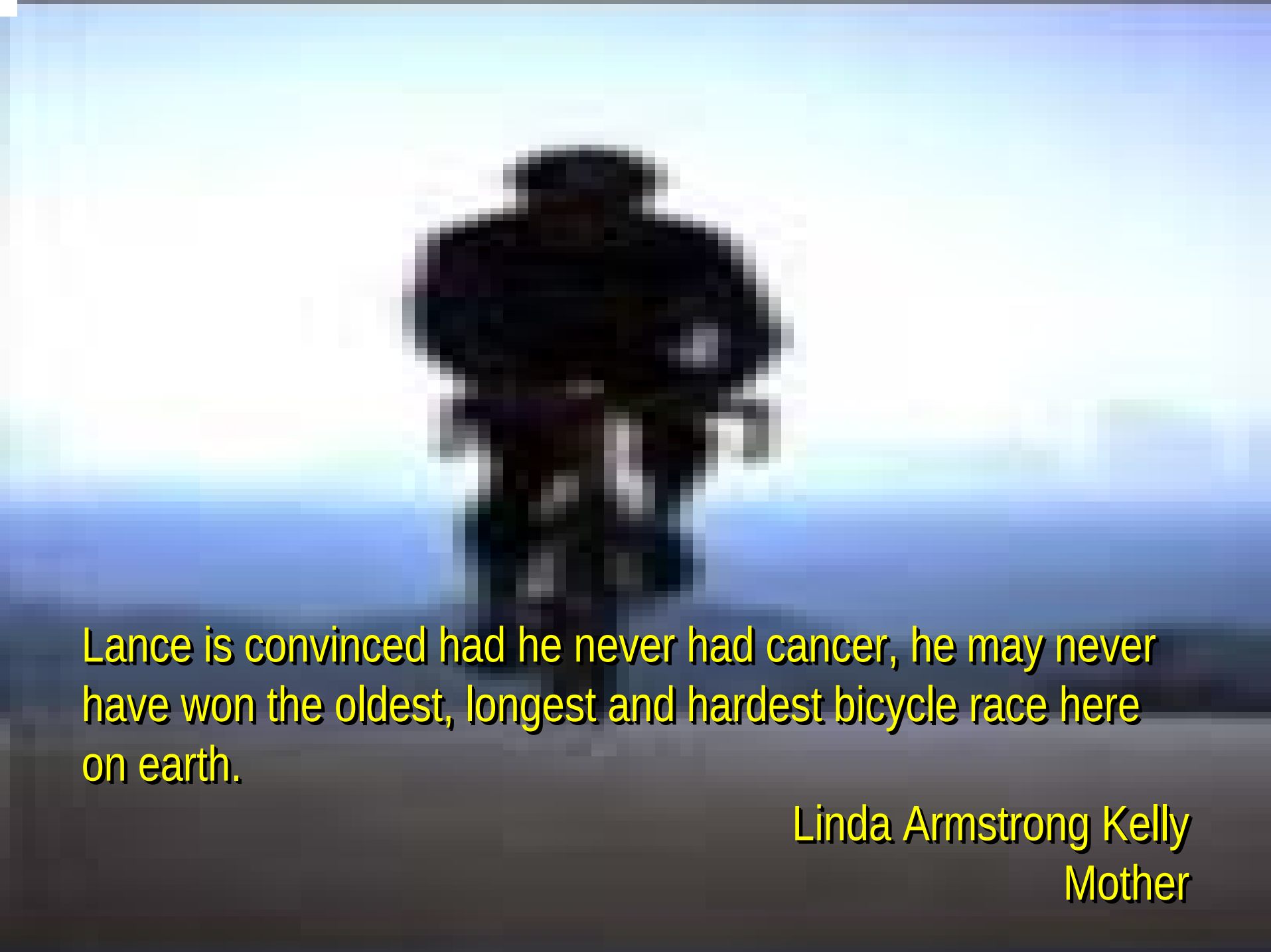
- Acupuncture
- Aromatherapy
- Flower Remedies
- Healing
- Herbal Medicine
- Homoeopathy
- Hypnotherapy
- Massage Therapy
- Reflexology
- Shiatsu
- Visualisation
- Yoga

Improve the sense of wellbeing and ability to cope with the situation.

Surviving Cancer …

Cancer survivors, like athletes, need to fuel their bodies efficiently and effectively to allow them the best chance to heal and to combat future cancers as well. A healthy high-fiber, low-fat diet and regular exercise is a common recommendation.

While this may sound like common sense advice, it's clear that common sense is not that common, and again it falls on the partnership of the health care team and the patient to find what works best in their situation


Lance is convinced had he never had cancer, he may never have won the oldest, longest and hardest bicycle race here on earth.
Linda Armstrong Kelly
Mother