

Les principes généraux sur le cancer

**PROGRAMME NATIONALE DE FORMATION DU PERSONNEL
MEDICAL EN CANCEROLOGIE**

MAI 2017



MSPP



Objectifs de présentation

A la fin de cette séance, les participants seront capable de:

- définir le cancer
- Comprendre l'épidémiologie de base du cancer
- Comprendre le pronostic du cancer et les facteurs qui l'influencent
- Décrire l'approche générale pour le diagnostic du cancer
- Appréciez les principales différences entre les cancers pédiatriques et adultes
- Appréciez les principales différences entre les cancers solides et liquides

Objectifs de presentation

Définir le cancer

C'est quoi le cancer?

- Commençant par une prolifération clonale de cellules anormales

Les clones sont des cellules identiques avec maquillage génétique

Les cellules sont anormales et leur croissance est dérégulée. Les cellules continuent à proliférer sans s'arrêter

Les cellules ont la capacité de métastaser (Voyage à d'autres sites dans le corps loin de la tumeur primaire)

Comment se développe le cancer?

Carcinogénèse en plusieurs étapes

Pour la plupart des cancers, la cellule cancéreuse s'accumule un certain nombre de modifications génétiques (mutations, délétions, amplifications) au fil du temps qui se traduisent par:

- L'indépendance de signaux d'inhibition de croissance favorisant la croissance externe et la réplication cellulaire
- Evasion de l'apoptose (mort cellulaire)
- Mise en place de l'angiogénèse (recrutement de nouveaux vaisseaux sanguins pour la croissance)

Le cancer n'est pas une simple maladie...

- Le cancer est un groupe de maladies hétérogènes
- Beaucoup d'agents peuvent causer le cancer mais pour beaucoup de cancers on ne connaît pas leur cause
A number of different agents cause cancer, but for many cancers we don't know the cause
- Le traitement et le pronostic sont variables et dépendent du type de cancer en cause

Qu'est ce qui cause le cancer?

1) Toxines



- **Tabac:** cancer des poumons, cancer de la tête et du cou, cancer de la vessie
- **Asbestos:** mesothelioma
- **Radiation et chimiothérapie:** acute myelogenous leukemia, cancer du sein, cancer des poumons

2) Infections



- **HPV:** cancer du col, cancer de la tête et du cou
- **Hepatitis B & C:** cancer du foie
- **Epstein-Barr Virus:** Lymphome de Burkitt, cancer nasopharynx
- **H. Pylori:** cancer de l'estomac, lymphome gastrique

Qu'est ce qui cause le cancer?

3) Hormones



- **oestrogen**: cancer du sein – menstruation
- Cancer des testicules (undescended testicle)

4) Autres facteurs de risque



- Cancer colorectal- ? Diète

Qu'est ce qui cause le cancer?

5) Inherited genetic predisposition



- **BRCA 1 and 2 for breast cancer**
- **Several genes for colorectal cancer**
- **Trisomie 21 for acute leukemia**

Qu'est ce qui cause le cancer?

6) Acquired genetic mutations



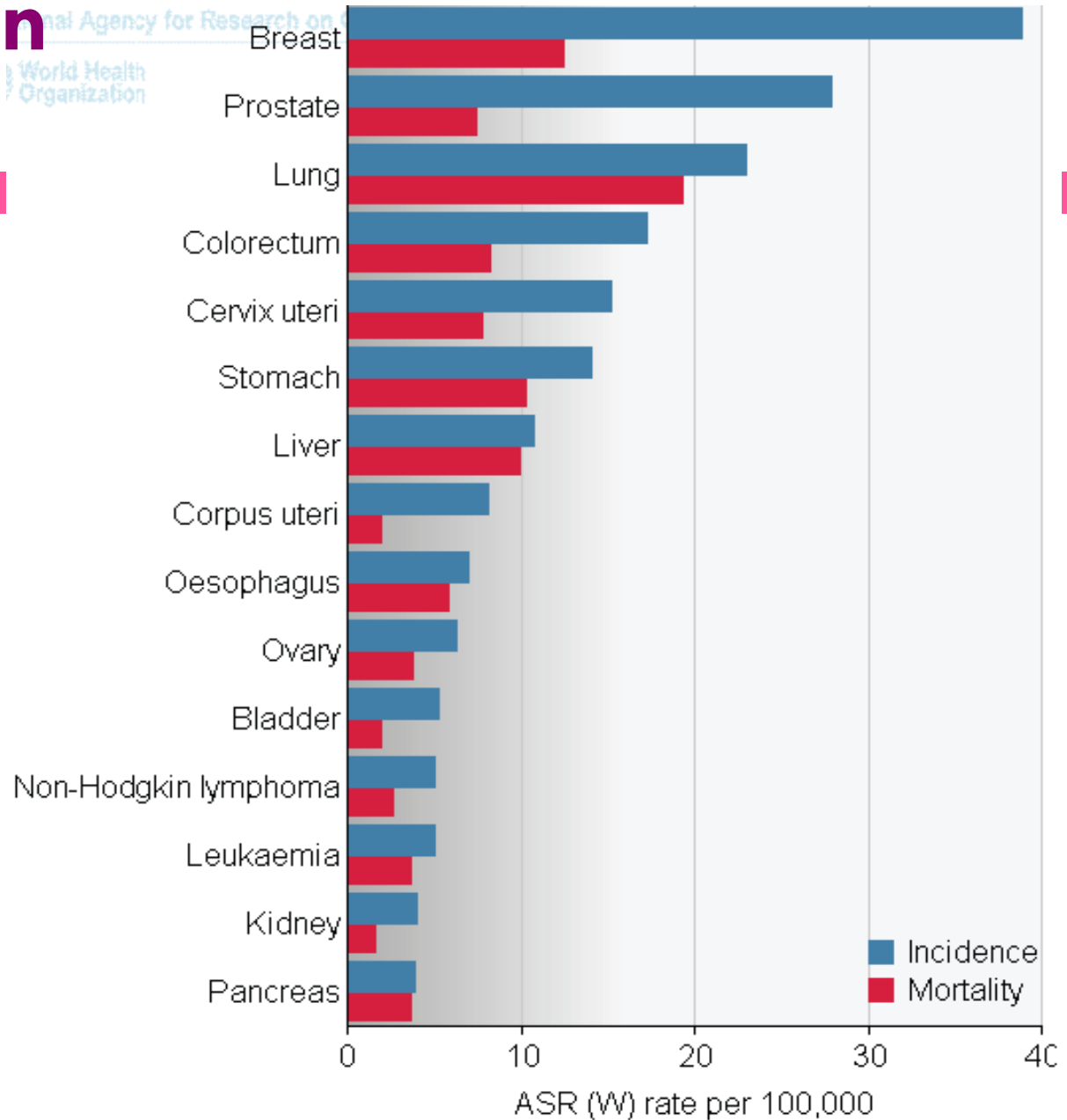
- Tumor suppressor genes – lose their function during oncogenesis
- Proto-oncogenes – enhanced function in cancer cells, often promote cell replications
- DNA repair genes – no longer work in cancer cells

Objectifs de présentation

Comprendre l'épidémiologie de base du cancer

Global Burden of Cancer

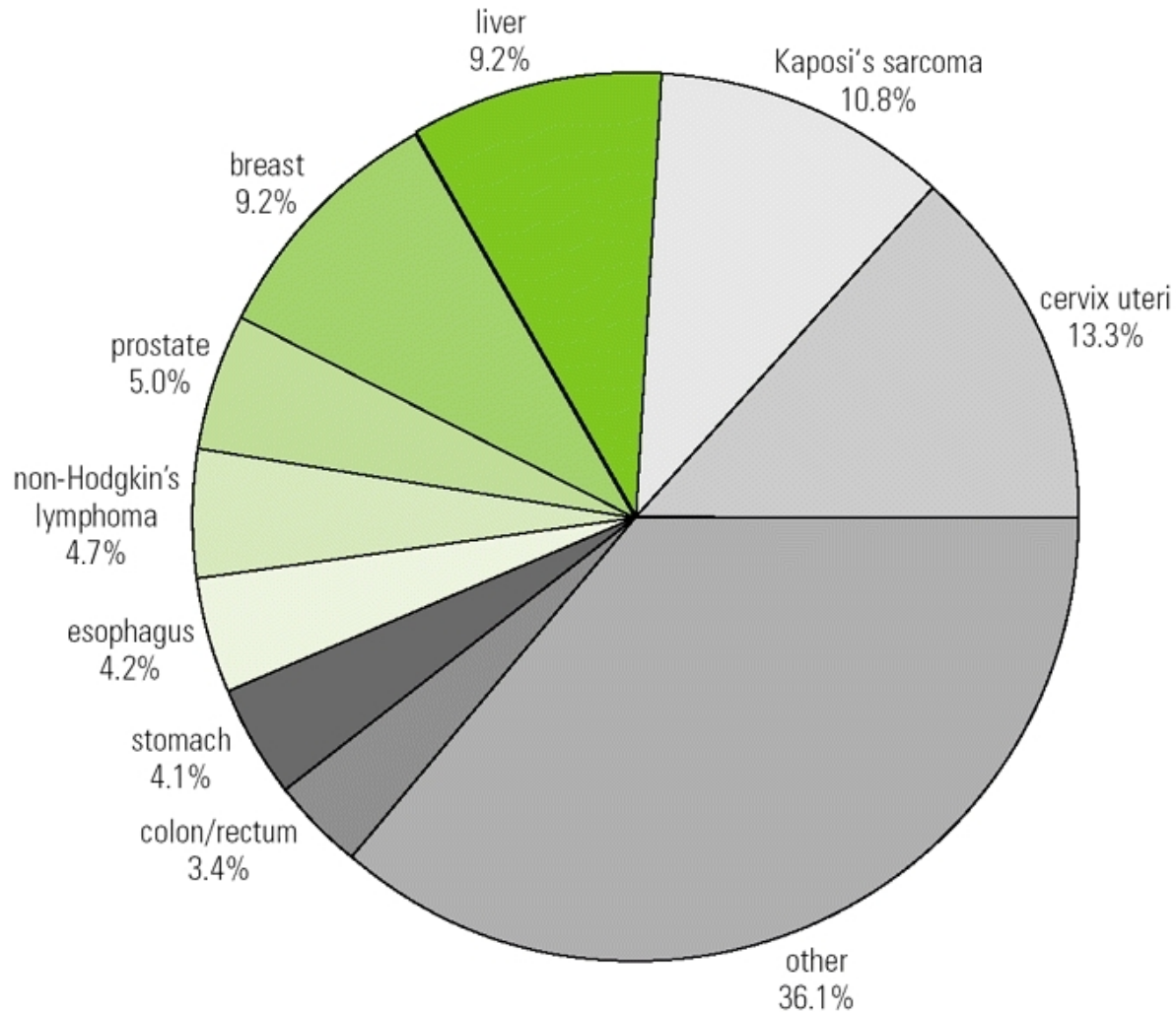
International Agency for Research on Cancer
World Health Organization



Source: Globocan 2008

Major Cancer Types in Sub-Saharan Africa

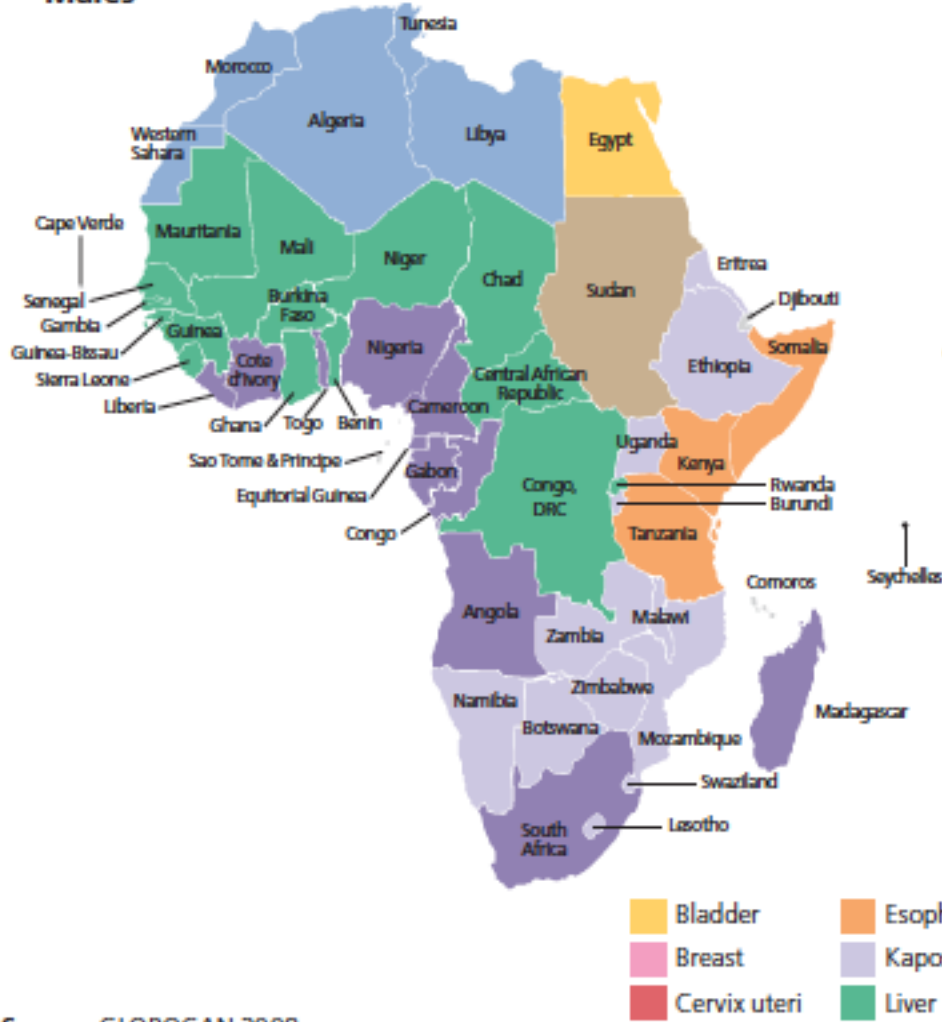
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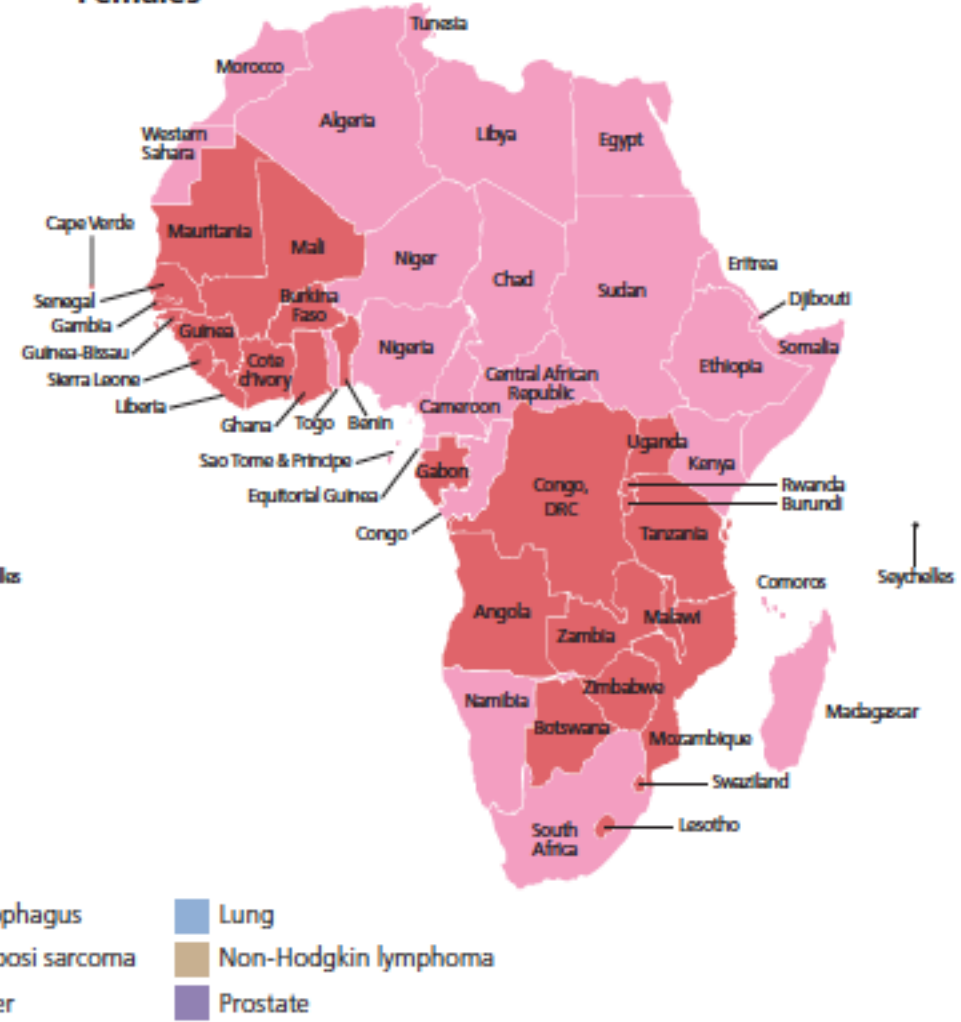
Source: Adapted from Ferlay et al. 2004.

Most Common Cancers in Africa, by

Males



Females

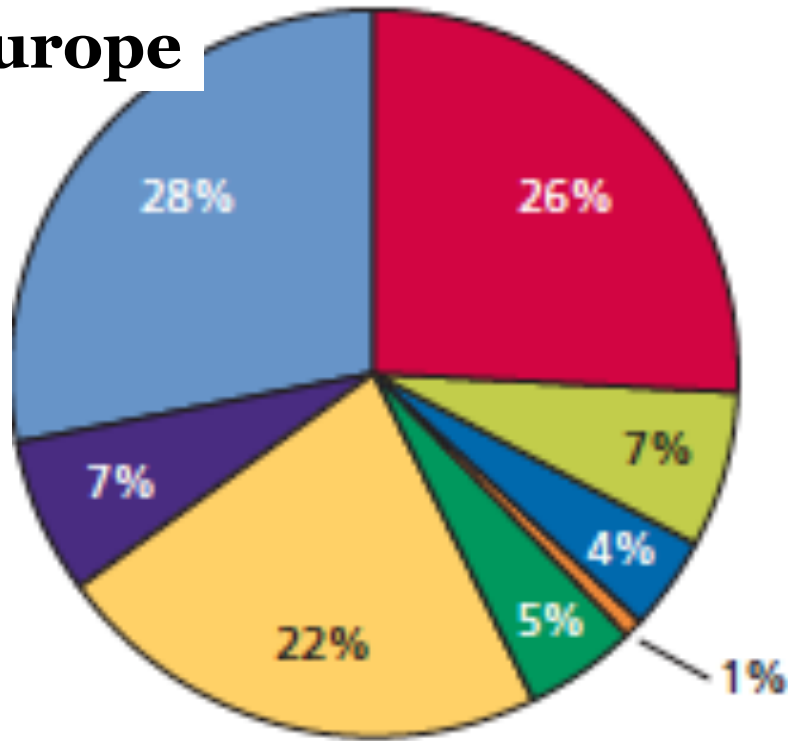


Source: GLOBOCAN 2008.

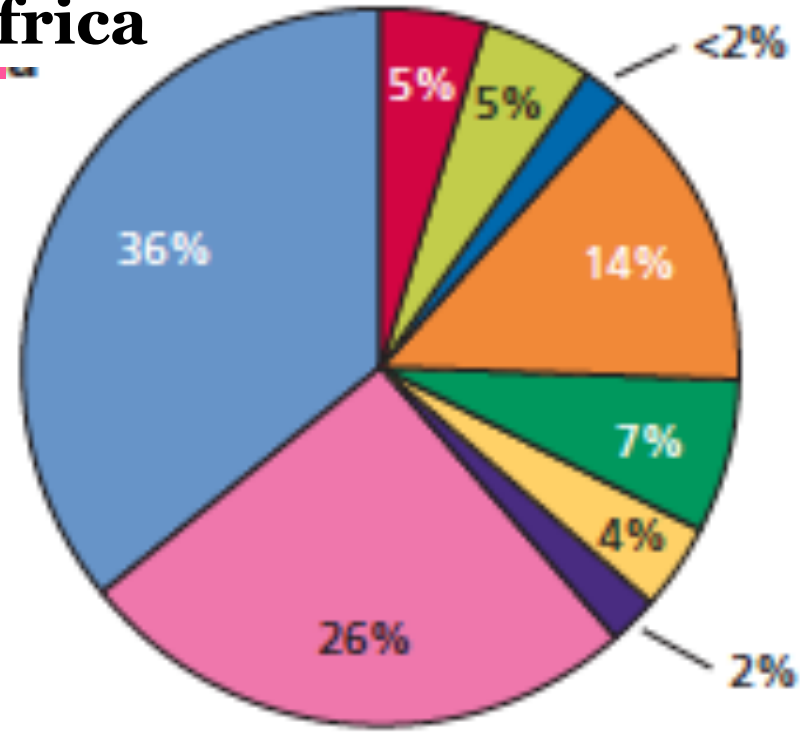
Global Cancer Facts & Figures, 2nd Edition, ACS

Distribution of Cancers in Children (< 15 yrs)

Europe



Africa



- Lymphoid leukemia
- Other leukemia
- Hodgkin lymphoma

- Burkitt lymphoma
- Other lymphomas
- CNS tumors

- Neuroblastoma
- Kaposi sarcoma
- Other neoplasms

Learning Objectives

By the end of this session, participants will be able to:

- a) Define cancer
- b) Understand the basic epidemiology of cancer
- c) **Understand cancer prognosis and factors that influence it**
- d) Describe general approach to diagnosing cancer
- e) Appreciate the key differences between pediatric and adult cancers
- f) Appreciate the key differences between liquid and solid cancers

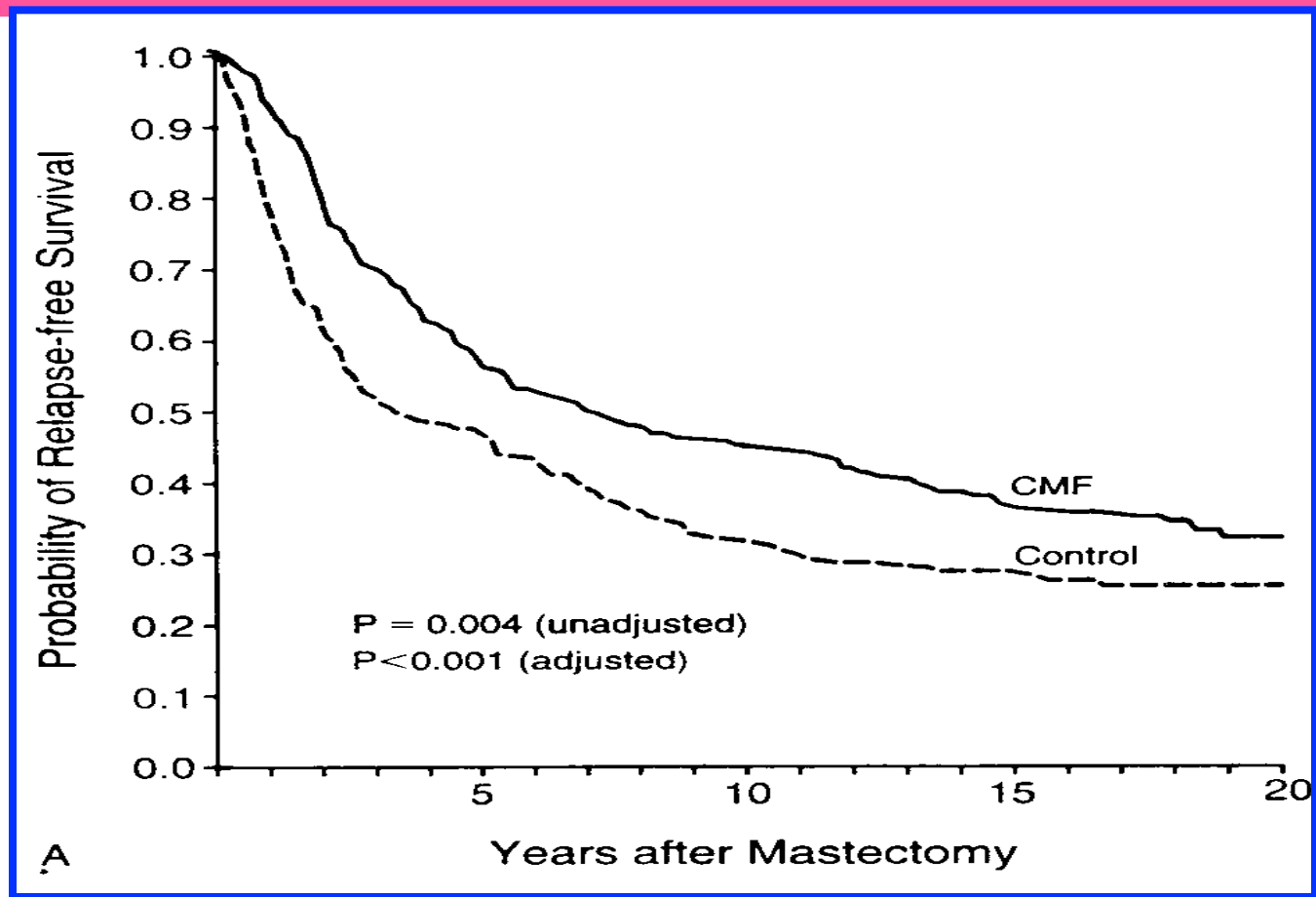
What is prognosis?

- **Prognosis:** the patient's chances for survival and cure
 - *What are the patient's chances of survival without treatment?*
 - *How can treatment improve the quality or length of the patient's life?*

How is prognosis measured?

- Estimates based on groups of patients whose situations are most similar to that of an individual patient
- Prognosis can be measured by:
 - 5 year survival rate: what proportion (%) of patients will still be alive 5 years after diagnosis
 - Median survival: how long (months) 50% of patients survive

Breast Cancer - The Original Milan CMF Adjuvant Trial



Bonadonna, NEJM 1995;332:901

What factors influence a patient's prognosis?

- Cancer type and stage
- Patient's age, general health (functional status), and response to treatment
- All cancers: genetic make-up of the cancer

Performance Status (PS)

Patients with a poor PS usually have large tumor burden and respond poorly to therapy – one of the most predictive signs of ultimate prognosis.

ECOG PERFORMANCE STATUS

- 0** Fully active, normal function
- 1** Able to walk and carry out light house and work duties; BUT restricted in strenuous activities
- 2** Able to walk, out of bed more than 50% of waking hours, can perform self-care activities independently.
- 3** Confined to bed or chair more than 50% of waking hours
- 4** Completely disabled and confined to bed or chair. Cannot carry out any self-care.
- 5** Dead

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Pathology Diagnosis

□ ***Why is a pathology diagnosis important?***

□ It is important to confirm diagnosis through pathology as many clinical findings cannot make the distinction between one cancer type and another or between cancer and a non-cancerous disease.

□ For example:

■ Head and Neck cancer vs Lymphoma vs TB

■ Gastric adenocarcinoma vs GIST vs abdominal lymphoma

■ Acute myelogenous leukemia (AML) vs acute lymphoblastic leukemia (ALL)

Pathology Diagnosis

- ***Why is a pathology diagnosis important?***
 - Helps you diagnose accurately and develop an effective treatment plan – treatment **MUST** be tailored for specific cancer, and varies greatly from cancer to cancer
 - Cancer treatment is not benign, and its effectiveness varies depending on the type of cancer

How is a tissue biopsy taken?



Staging

- ***What is staging?***
 - The process of determining the spread and curability of the disease (is it metastatic?)
- ***Why is staging important?***
 - Helps determine prognosis and treatment plan

Staging

- ***What are examples of staging?***
 - Early Stage – Locally Advanced – Metastatic Disease
 - Stage I – Stage II – Stage III – Stage IV
 - Low risk – Standard risk – High risk

How do we stage cancer?

- **Physical Exam**
- **Labs**
 - NFS (CBC), liver function tests, alkaline phosphatase, creatinine
- **Imaging**
 - Chest x-ray, liver ultrasound +/- CT
 - Imaging of other parts of the body if symptoms are suggestive (e.g. spine)
- **Other**
 - Sometimes lumbar puncture (for cancers that readily spread to CNS)

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Cancer in Children vs Adults I

	PEDIATRIC CANCERS	OVERLAPPING	ADULT CANCERS
Types	<ul style="list-style-type: none">•ALL•Burkitt's•Wilm's tumor•Rhabdomyosarcoma•Osteosarcoma•Neuroblastoma	<ul style="list-style-type: none">•Lymphomas•CML	<ul style="list-style-type: none">•Lung•Breast•Cervical•Liver•Stomach•AML

Cancer in Children vs Adults II

	PEDIATRIC CANCERS		ADULT CANCERS
Characteristics	<ul style="list-style-type: none">•Rarely caused by environmental or lifestyle factors (like smoking, HPV, Hepatitis B)•Generally more curable		<ul style="list-style-type: none">•Often caused by environmental or lifestyle factors, therefore amenable to risk factor reduction•Less curable particularly when in an advanced stage

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Hematologic (**LIQUID**) Cancers

Definition

- Cancers of the blood and lymphatic system

Features

- Less complex genomically
- Treated mostly with systemic therapy
- Advanced stage disease often curable with systemic therapy

Examples

- Lymphomas (Burkitt's, non-Hodgkin's, Hodgkin's)
- Leukemias (ALL, AML, CML, CLL)
- Plasma cell disorders (Multiple myeloma)

Epithelial (**SOLID**) Cancers

Definition

- ‘All other cancers’ or ‘cancers that cause tumors’

Features

- Complex genomically
- Only curable when detected early and with treatment that includes surgery
- Advanced stage disease mostly NOT curable

Examples

- Breast
- Cervical
- Lung
- Ovarian
- Head and neck
- Gastric
- Colo-rectal
- Pancreatic
- Esophageal

Summary

- Cancer represents a significant burden of disease all around the world, including in Haiti
- Cancer prognosis is influenced by many factors, including cancer type and stage and patient's performance status
- Accurate diagnosis, most often requiring pathology, is crucial to determining appropriate treatment
- There are notable differences in childhood vs adult cancers, and liquid vs solid cancers