



Molecular Imaging, A Gateway to Molecular Medicine

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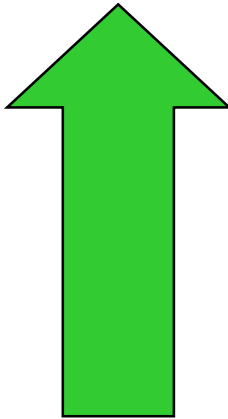
Solutions, Systems and Devices Innovations in Caring



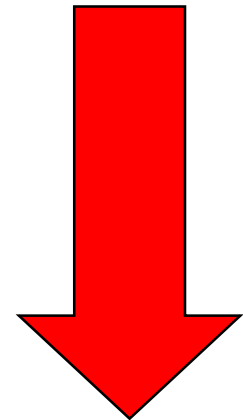


Trends in healthcare

Quality

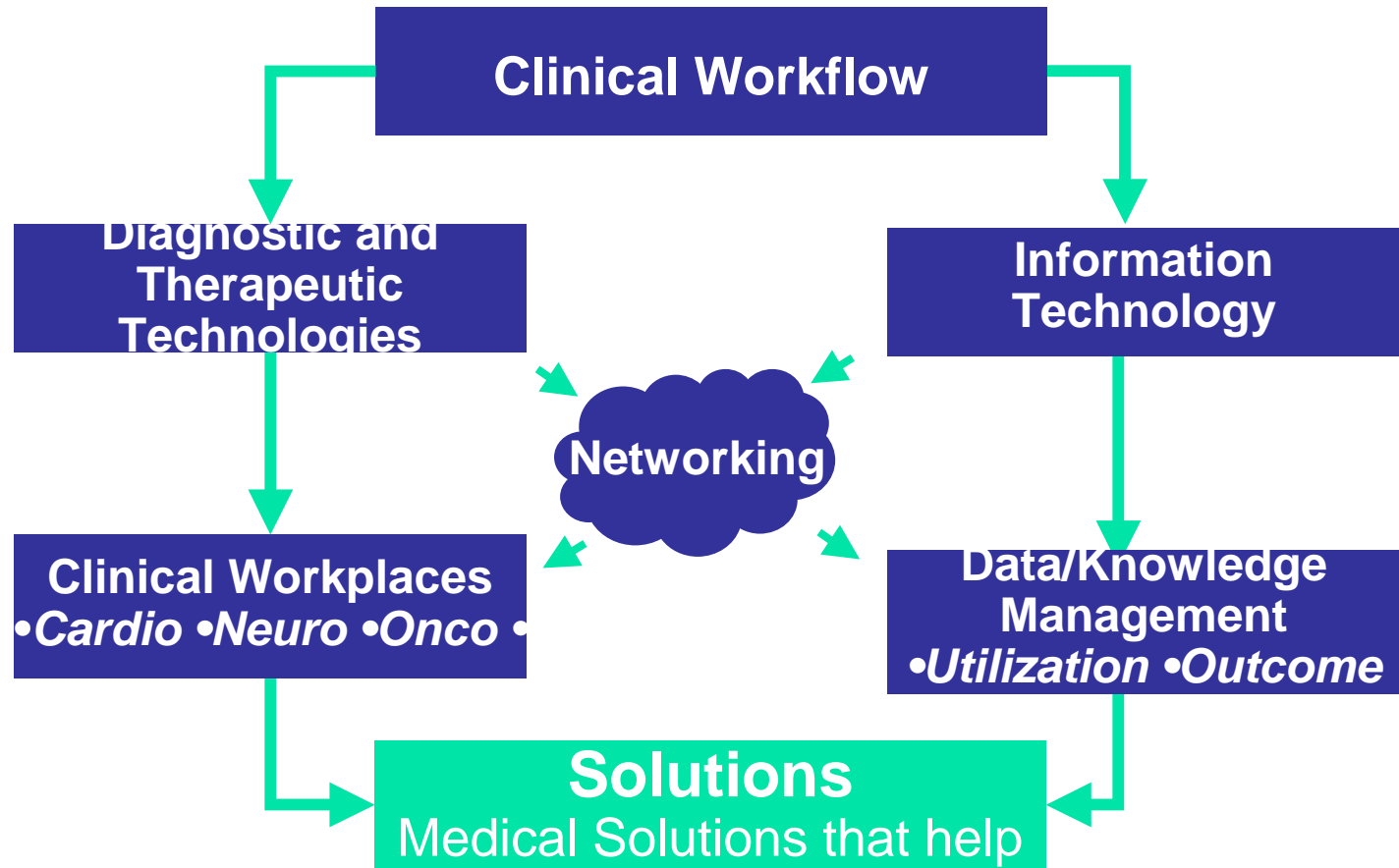


Cost



by Innovation and Process optimization

Improvement by process optimization



Improvement by innovation

1877 1885 1900 1910 1950 1960 1970 1980 1990 2000

Vacuum Tube

Semiconductor

Digital network

Electromedicine

Radiological Diagnoses

Radiation Therapy

Audiology

Nuclear Medicine

Ultrasound

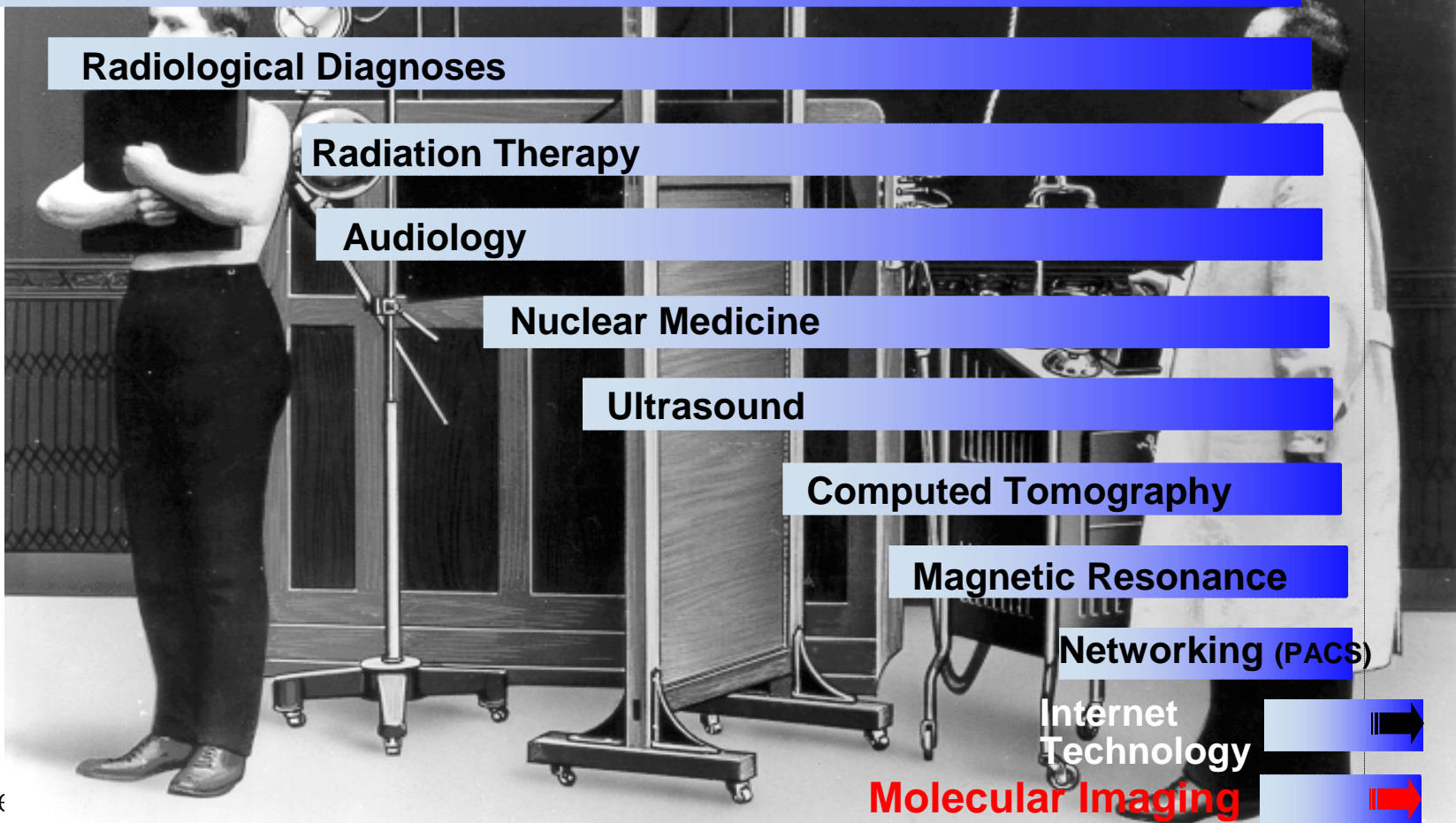
Computed Tomography

Magnetic Resonance

Networking (PACS)

Internet
Technology

Molecular Imaging





Paradigme shift

Morphological Imaging

Spatially resolved
anatomical
characteristics
of changes,

which may be
caused by a disease

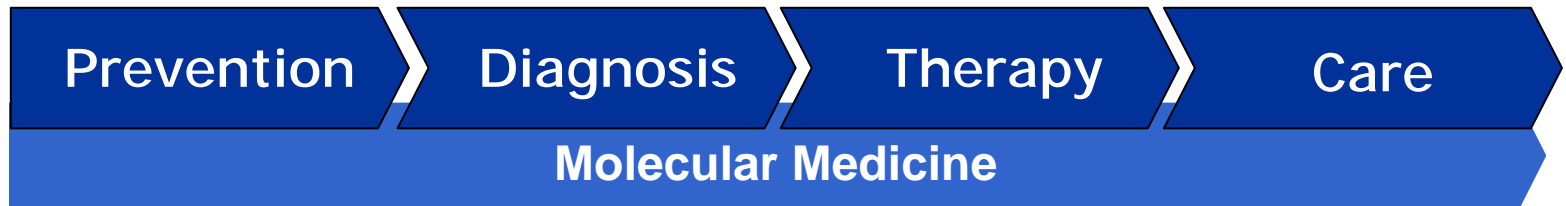
Molecular Imaging

In-vivo representation of
specific **molecular**
or **cellular**
characteristics,

which may be the
cause of a disease

Diagnosis of disease in very early stages

Several steps

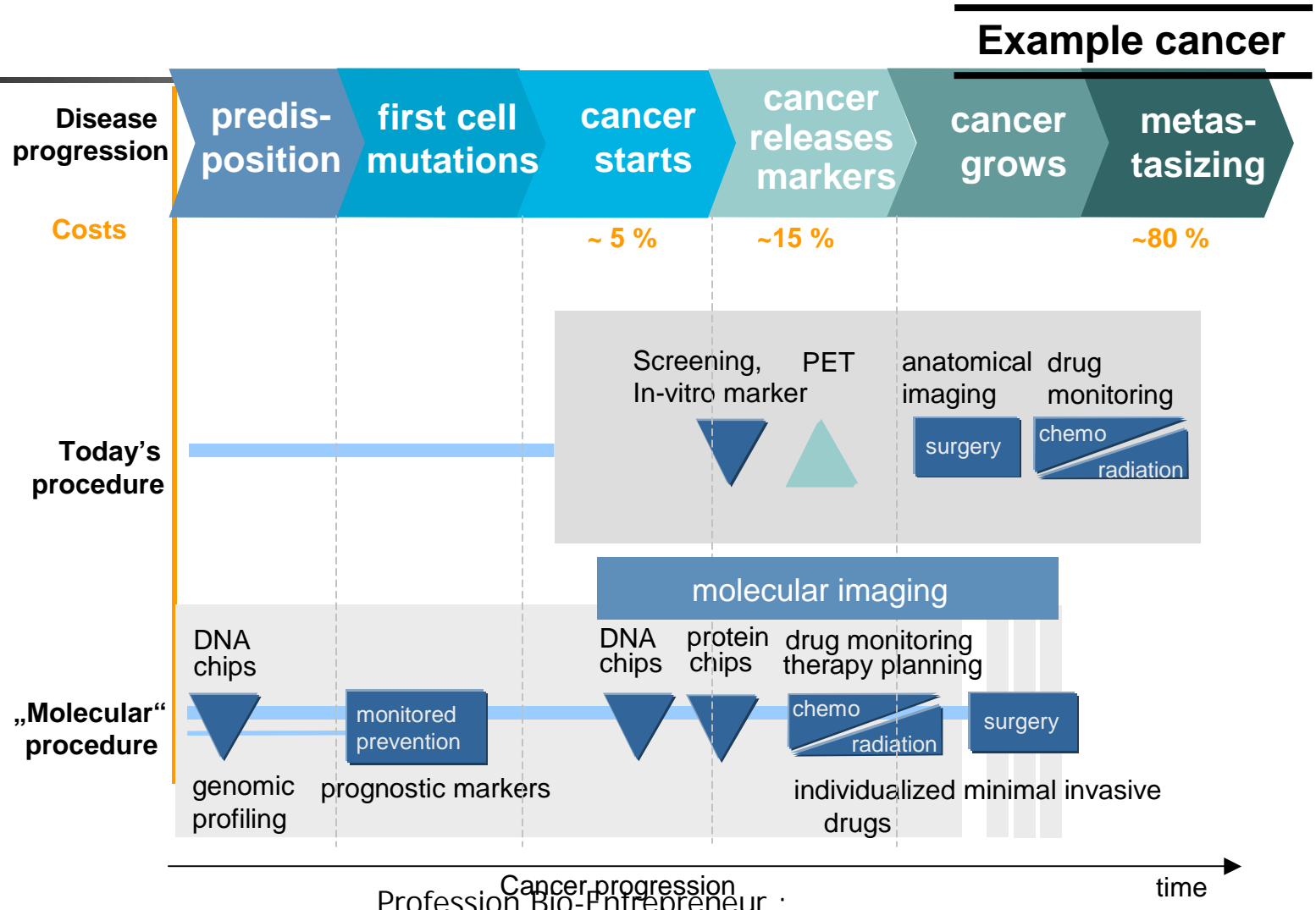


- **molecular markers for pre-disposition**
- **in vivo molecular imaging with**
 - new / combined modalities
 - new contrast agents
 - new applications
- **in vitro molecular diagnostics with**
 - new technologies
 - new disease-specific markers
- **molecular design of new drugs**
- **individualized therapy based on genetic and protein expression profiles**
- **molecular in vivo and in vitro control of therapy**
- **near patient-monitoring of health status**

Profession Bio-Entrepreneur **progress**

www.centrale-sante.net

The ultimate goal: early, efficient and individualized Diagnosis & Therapy



NM, Fluorescence-Optical and MRI: Most promising Molecular Imaging technologies

Morphology Physiology Metabolism **Molecules**

CT

e.g. Dynamic, Perfusion

US

e.g. Dynamic, Flow, Perfusion

MRI, MRS

e.g. Dynamic, Flow, Perfusion, Diffusion, Molecules

**10⁶ -10⁸
molecules/cell**

NM

e.g. Perfusion, Molecules

**Several
molecules/cell**

Fluorescence-

Optical

e.g. Molecules

**Several
molecules/cell**



Conclusion for molecular imaging

- help potential patients at risk by preventing disease outbreak
- diagnose diseases early at their onset
- support efficient therapies with measurable outcomes
- contribute reducing healthcare delivery costs
- Requires collaboration between new expertise at R&D level as well as between potential end users.



To know more about it

- **Siemens Medical Solutions** is one of the largest suppliers to the healthcare industry in the world. The company is known for bringing together innovative medical technologies, healthcare information systems, management consulting, and support services, to help customers achieve tangible, sustainable, clinical and financial outcomes. From imaging systems for diagnosis, to therapy equipment for treatment, to patient monitors to hearing instruments and beyond, Siemens innovations contribute to the health and well-being of people across the globe, while improving operational efficiencies and optimizing workflow in hospitals, clinics, home health agencies, and doctors' offices. Employing approximately 31,000 people worldwide and operating in more than 120 countries, Siemens Medical Solutions reported sales of 7.4 billion EUR, orders of 7.8 billion EUR and group profit of 1,1

billion EUR for fiscal 2003. Further information can be found under:

<http://www.siemens.com/medical>