

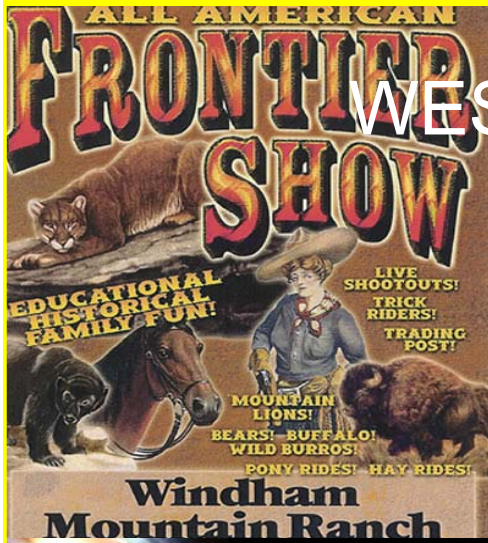
MEDICINE BEYOND FRONTIERS

Charas Suwanwela

4th Congress of the Asian Medical Education Association

Chulalongkorn University, Bangkok

23 October 2007



WESTERN FRONTIERS

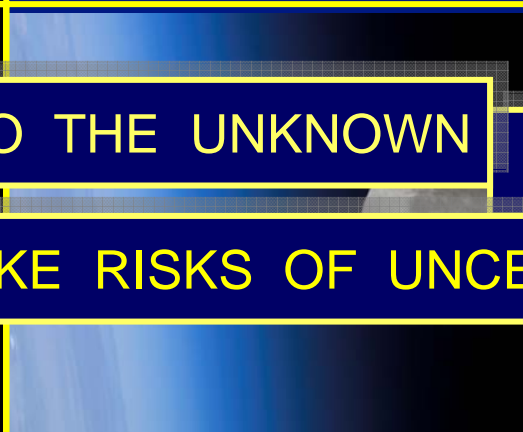


OUTER SPACE

EXPLORE INTO THE UNKNOWN

LOOK FOR OPPORTUNITIES

TAKE RISKS OF UNCERTAINTY





**SCIENCE & TECHNOLOGY
FRONTIERS**

EQUITY FRONTIER
Underserved, rural, marginalized

BUSINESS FRONTIER
CAPITALISM / PRIVATE

**CROSS-COUNTRY
MEDICINE
FRONTIER**

MEDICAL FRONTIERS

**ALTERNATIVE
MEDICINE
FRONTIER**

TELEMEDICINE FRONTIER

**AGEING CARE
FRONTIER**

PEDAGOGIC FRONTIER

QUALITY FRONTIER

May 16, 1998

GENENTEC announced the result of clinical trials proving the efficacy of "Herceptin" in the treatment of advanced breast cancer for patients with Her2/neu receptor gene over-expression.

1992 --- : Phase I, II & III multi-center clinical trials.
Many controversies: scientific, business, philanthropic, humanitarian.

1989: GENENTECH invested in R & D to find antibody to the gene.

1987: Dennis Slamon found over-exprsssion of Her-2/neu to be connected with cancerous growth in breast and ovarian cells; developed tool as diagnostic test.

1984: Axel Ullrich isolated DNA functioning as hEGF receptor = Her-2 gene.
1979: Robert Weinberg isolated neu oncogene from cancerous mouse cells.

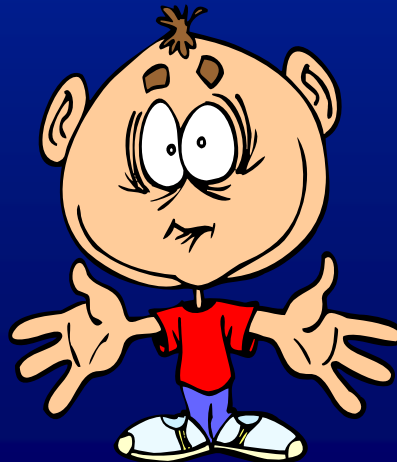
6% of breast cancers respond to Herceptin.
Cost of Herceptin therapy: US\$ 3,000 per month

Personalized Medicine

SUB-CATEGORIES OF DISEASES

Test for individual's chances of success to certain drug therapy.

Benefits: Positive case – chance of successful treatment
Negative case – avoid risks of drug toxicity, cost



May 19, 2005: Newcastle NHS Fertility Clinic announced the success in cloning human embryo (using similar technique that created Dolly the sheep).

South Korea announced the success in creating patient-specific stem cells by using the cloning process on skin cells from patients. (Claim later retracted)

2000: Reports of application in treatment of myocardial infarction, stroke, Alzheimer's, Parkinson's and other diseases.
Controversial results & concern re dangers & ethical issues.

"Spare" embryo, embryonic stem cell lines, Embryonic germ cells, cloning, nuclear transfer

Reproductive vs therapeutic

Prohibition, guidelines, funding limitations
Changing stands.

STEM CELL FRONTIER

Regenerative Medicine

Interferon alpha, erythropoietin
BLyS, Trail 1 death receptor
Gene therapy

Human
Substances

In-vitro organ building
Cell-based therapy
T-cell therapy

Cloning
Nuclear transplantation
Cord blood bank

Cell & Tissue
Engineering

STEM CELLS
Genetic Engineering
Human Genome

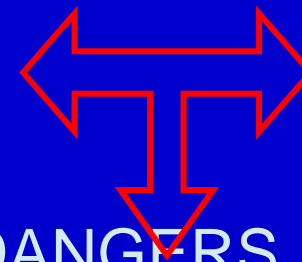
Embryonic
Stem Cells

Atomic-scale engine
Nanotechnology

OPPORTUNITIES

COST

DANGERS



Emerging viral diseases

GENOMICS
PROTEOMICS

Molecular biology

NANOTECHNOLOGY

Endoscopic & Minimally invasive surgery

Nanorobots

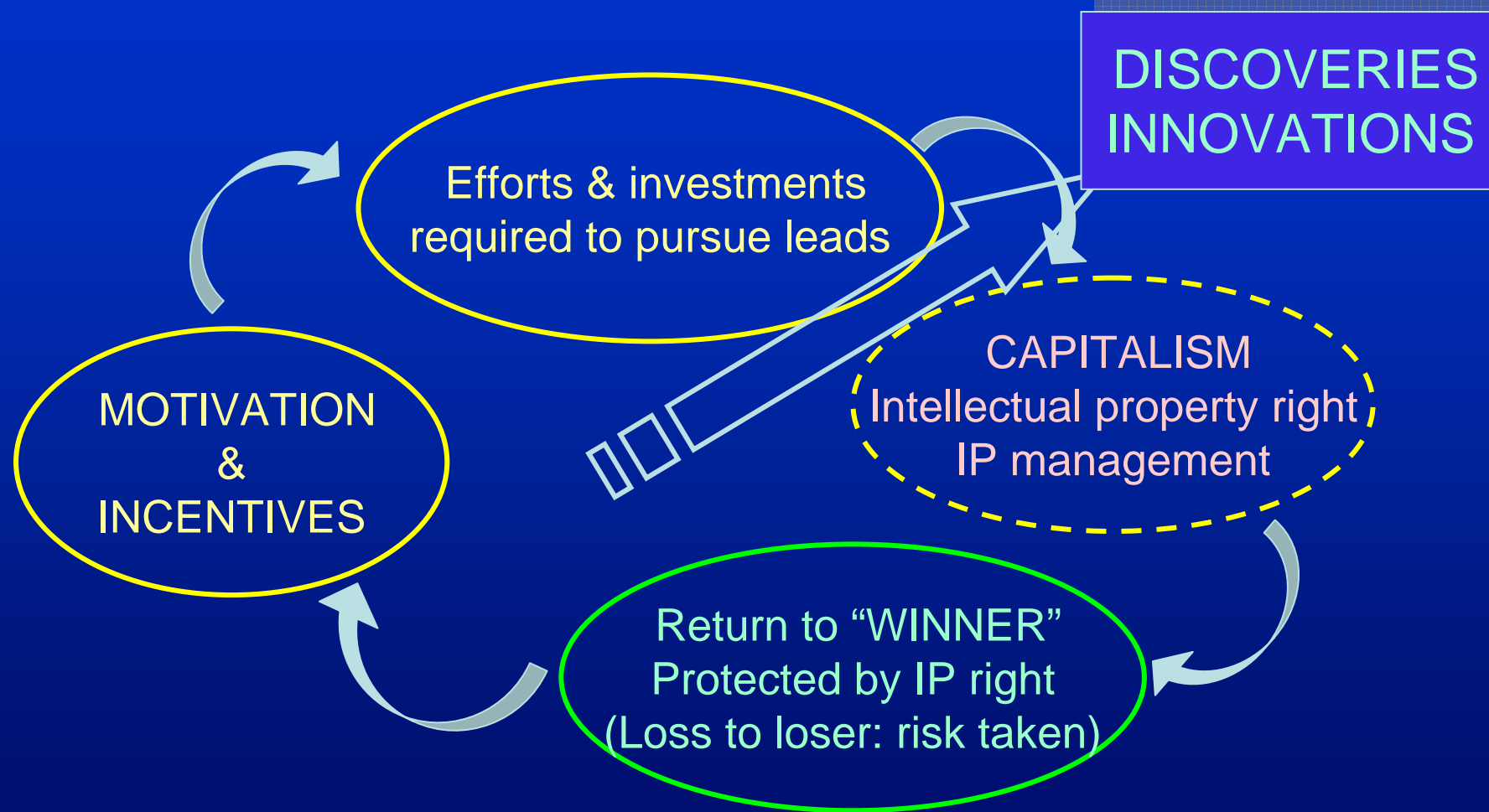
Imaging Technologies

PERSONALIZED MEDICINE

REPARATIVE MEDICINE

X X X X X

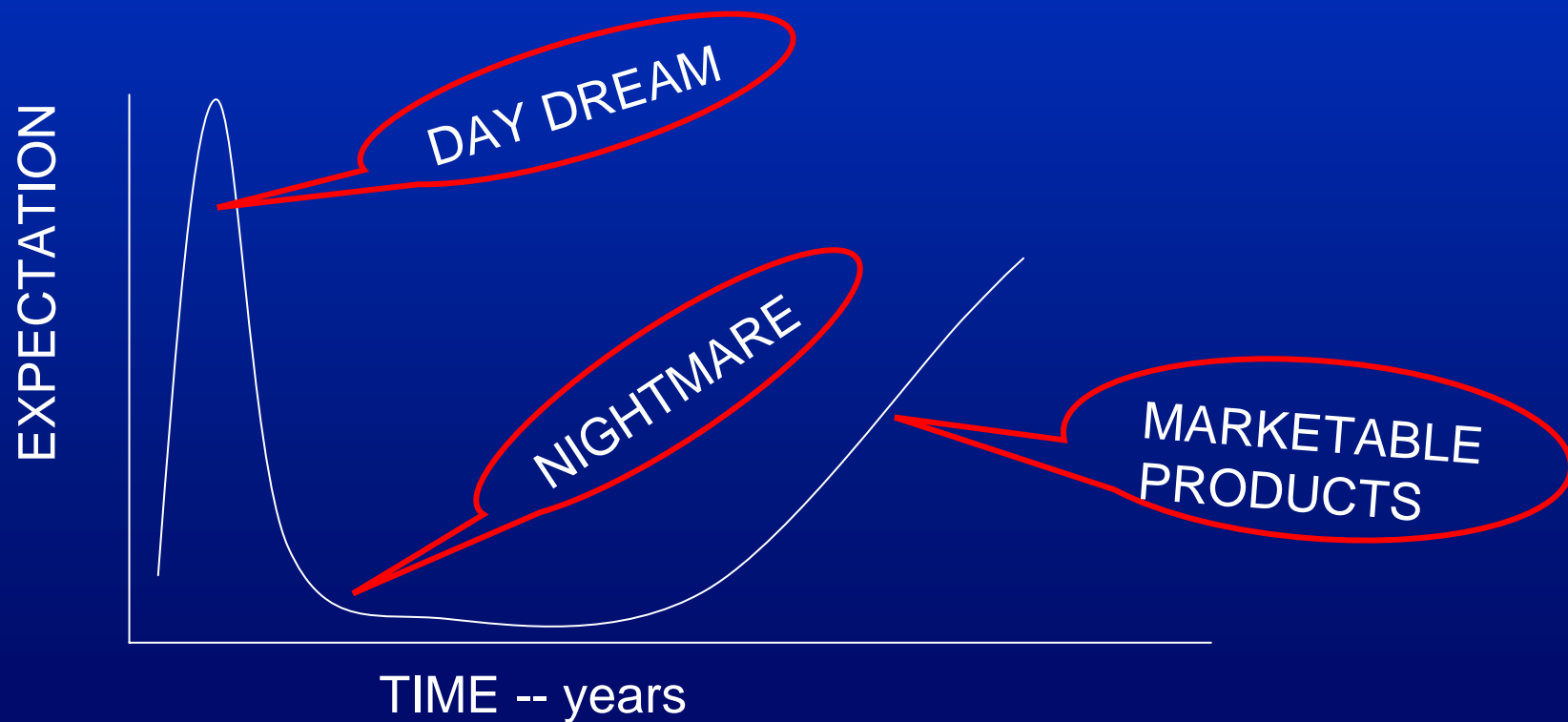
SCIENCE & TECHNOLOGY FRONTIERS



HIGH COST OF NEW TECHNOLOGIES

Special and untiring efforts and huge investments are required for overcoming the nightmare period before marketable products are uncovered. Private entrepreneuring management is mandatory.

Benefits (esp. financial) dictate the direction and choices of R & D.

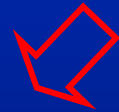


Adopted from Prof. Hiroyuki Yoshikawa

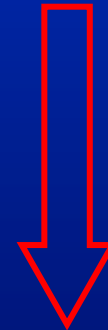
HIGH COST OF MEDICAL CARE



INEQUITY



10 : 90 DISEQUILIBRIUM
"Orphan drugs"



Catastrophic illnesses
Deterioration of health status



KNOWLEDGE SOCIETY

GLOBAL
KNOWLEDGE
POOL

KNOWLEDGE ACCESS
KNOWLEDGE VALIDATION
KNOWLEDGE VALUATION
KNOWLEDGE OPTIMIZATION
KNOWLEDGE DISSEMINATION

KNOWLEDGE BROKERING

EDUCATION
DEVELOPMENT
SERVICES

DESIRABLE QUALITY OF MEDICAL GRADUATES

Knowledge access – internet, language competencies

Knowledge validation -- critical appraisal, research methods

Knowledge optimization – holistic, economic, humanistic

Knowledge dissemination -- communication skills

TEAMWORK – trust, respect for others, leadership

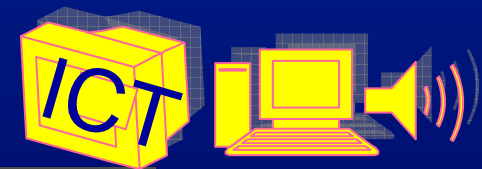
*PROFESSIONAL COMPETENCIES – Knowledge, skills
Reflective thinking, wisdom, morality*



'MDCU 12 learning outcomes'

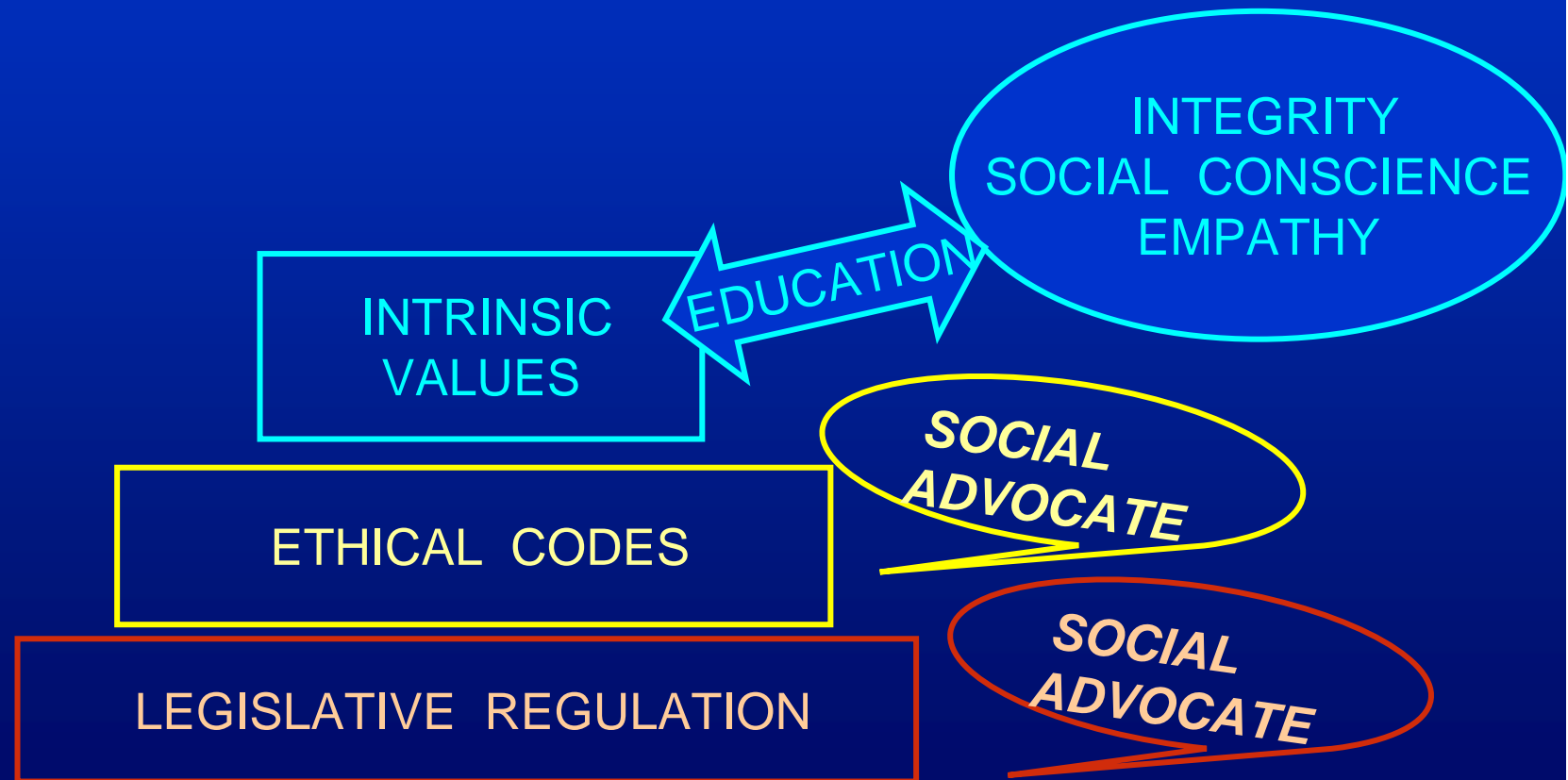
- (1) clinical diagnosis
- (2) patient investigation
- (3) patient management
- (4) procedures
- (5) communication
- (6) holistic approach
- (7) medical ethics and professional laws
- (8) critical thinking
- (9) basic and clinical sciences
- (10) roles of doctor and social responsibilities
- (11) professional and personal development
- (12) leadership and teamwork

SUCCESSFUL IMPLEMENTATION ?



RE-ENGINEERING CLINICAL EDUCATION

ABILITY TO COPE WITH THE UNAVOIDABLE.
ABILITY TO RESIST THE UNDESIRABLE.
ABILITY TO CORRECTLY DIFFERENTIATE THE TWO.



OPPORTUNITY



NEW POSSIBILITIES
& POTENTIALS

ALLEVIATE SUFFERING,
DISABILITIES & DEATH.
PROLONG LIFE.
SUSTAIN QUALITY OF LIFE.

NEW DANGERS

HARM

Inequity, injustice, conflict
Threat to human values
Threat to humanity



Technological possibility
Unnecessary cost
Commercially induced desire



Do you want to see your baby's face before birth?

CATCHING CANCER BEFORE IT KILLS

Early detection and accurate diagnosis are essential for successful cancer treatments - and now they have a powerful new ally

body but the sensitivity is not so high," explains Dr. Samart.

Nevertheless, in the past year or so the latest PET/CT (Positron Emission Tomography/Computed Tomography)

scan and a high Now insta

hospitals under Bangkok Hospital Medical



Bangkok Post, 14 July 2007
(Advertorial)

Saving lives

Over 600 patients have scans so far at Wattanosoth Hospital, the hospitals under Bangkok Hospital Medical Center.

The case of a lung cancer patient is typical. A conventional diagnostic PET scanner showed no abnormal area in which the PET scan caught the cancer. The cancer might have gone hand if the PET scan had not.

"There are so many cases where this equipment improves our diagnosis and enables us to treat a patient far more than otherwise," Dr. Samart.

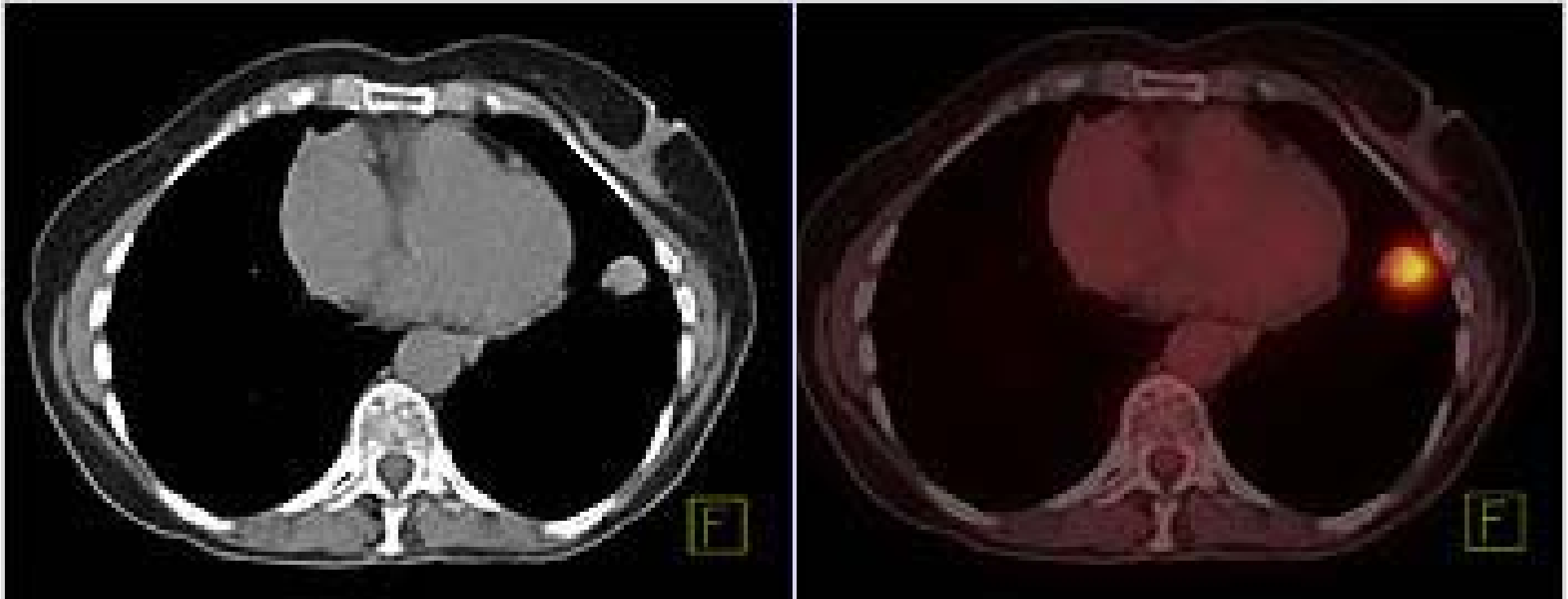
The doctor recommends that people who want to get checked for cancer should first have routine checks for the most common cancers, such as a chest x-ray, a colonoscopy for colon cancer, and a Pap smear for colon cancer. If you are worried, the PET/CT scan can detect anything that hitherto was hidden.

SIDEBAR

PET applications in cancer scanning

- Early detection of cancers in various organs, such as lung cancer, h

PET SCAN AND CYCLOTRON INVESTED



Do you want to know whether you have a hidden cancer ?

Commercially induced desire, working on fear.
Not recommended medically.
Costly and can be harmful.



DESIRABLE QUALITY
OF MEDICAL GRADUATES

EQUITY FRONTIER
Underserved, rural, marginalized

DESIRABLE MEDICAL EDUCATION

KNOWLEDGE SOCIETY 1

SCIENCES &
TECHNOLOGIES

CAPITALISM
COMMERCIALIZATION
COMPETITION

EXPLICIT KNOWLEDGE
EVIDENCE-BASED MEDICINE

INEQUITY
INJUSTICE
DOMINATION
EXPLOITATION
CONFLICT

KNOWLEDGE SOCIETY 2

HUMANITY
HUMAN RIGHT

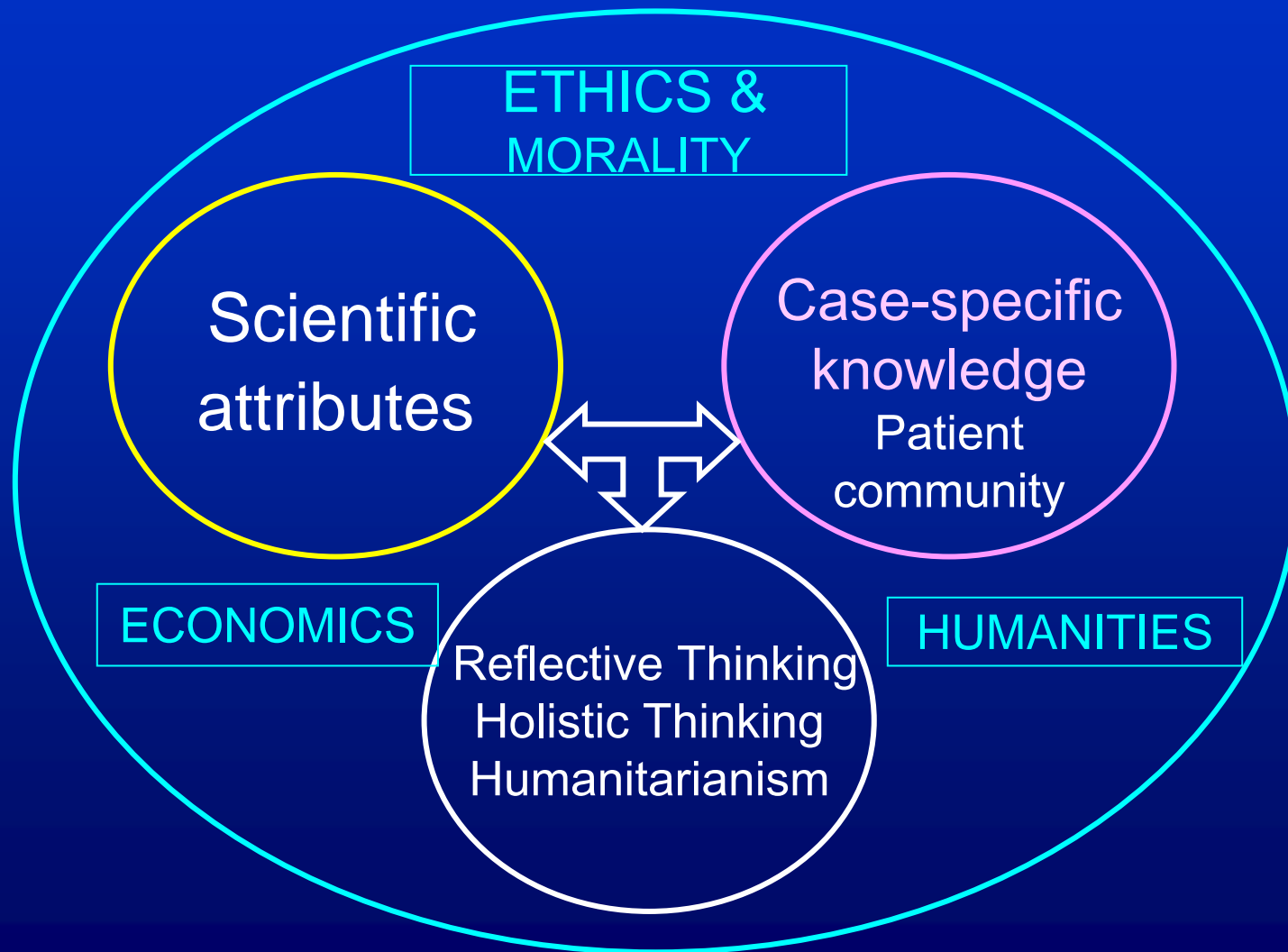
“Sufficiency Economy”
Moderation, middle-path
EMPATHY

TACIT KNOWLEDGE
HOLISTIC & HUMANISTIC

Equity, Access
Social Justice
Sharing
Peace & Harmony



Desirable attributes of medical doctors for medical decision-making.



SCIENCE & TECHNOLOGY FRONTIERS

EQUITY FRONTIER
Underserved, rural, marginalized

VALUES MORALITY ETHICS
REGULATION PEDAGOGY EDUCATION SKILLS
COMPETENCIES QUALITY ACCREDITATION

BEYOND FRONTIERS

MEDICAL FRONTIERS

PEDAGOGIC FRONTIER

QUALITY FRONTIER

CROSS-COUNTRY MEDICINE FRONTIER