General Surgery in Portugal

Scientific and Research Activities

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Science is always born of a question and daily clinical practice is inexhaustible source of questions!
The scientific method is applicable to the General Surgery?

Without understanding the scientific method, it is not possible to establish a modern surgery and thus training in science becomes essential to surgeons training!
General Surgery Research

The scientific method is applicable to the General Surgery?

Surgical activity in the XXI century requires that all decisions are based and that its legitimacy based on the best knowledge available!
General Surgery Research

The scientific method is applicable to the General Surgery?

It is not acceptable justification:

"I believe that ..." “eu acredito que ...”

"My experience ....” “a minha experiência ....”

"I have faith...” “tenho fé...”!
General Surgery Research

What are the advantages?  

- The practice of experimental surgery! (Anatomical and functional homology)!
- Learning the scientific method (the search for a precise answer to a clearly formulated question)!
- Research makes more demanding / skeptical surgery!
- Interdisciplinary with other areas of knowledge!
- Experience on scientific publication, the selection of information, exhaustive search of the literature ...
Why is EBM important?

“Evidence-based medicine is the integration of best research evidence with clinical expertise and patient values”

- Dave Sackett

Slide courtesy Prof Paul Glasziou, CEBM
General Surgery Research

Difficulties?

- The exponential scientific breakthrough!
- Increasingly absorbent clinical tasks!
- Tenuous motivation to investigate during the clinical training!
- Discouraged effort and academic recognition!

Myths about scientific publications
General Surgery Research

Difficulties?

- Valuation of clinical performance and compliance with routine obligations vs character essentially plastic and individual of any training process...
- There is no motivation for the research that will stand the lack of funding!
Precision in Liver Surgery

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Fig. 1 The schematic evolution of surgery: From intuitive to empirical and moving now toward precision.
Precision in Liver Surgery

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Fig. 2 Pyramidal system of precision surgery. The pyramidal cornerstone of precision surgery consists of state-of-the-art science and technology (S&T), the bio-psycho-social medical model, and the legacy of conventional surgery. Based on all of these, the platform of precision is established with the integration of available knowledge, techniques, and experience related to surgery. The practice of precision surgery is rule-based with high certainty. The core strategy of precision is to seek and realize a precise balance of “3M”—maximal lesion removal, maximal organ sparing, and minimal surgical invasiveness by scientific decision making and accurately controllable surgical intervention. Surgical service as such would realize multiobjective optimization accommodating the “3O”—therapeutic effectiveness, surgical safety, and minimal invasiveness, and would eventually give rise to the optimal recovery of each patient.
General Surgery Research

Clinical Internalship General Surgery in Portugal
Evaluation during and at the end of “clinical internship”

Technical training

vs

Scientific training
Training Program of Medical Internship in General Surgery

Duration

- First Year (ano comum) (12 months)

- Specific training (72 months)
  - 5 mandatory stages of General Surgery (5 * 12 meses)
  - 4 optional stages (4 * 3 meses)

- 40 h / Week
General objectives of knowledge
(Decreto-Lei nº 18/2011, de 26 January)
General objectives of knowledge

1.2 — Objectivos de conhecimento:

a) Etiopatogenia, epidemiologia, fisiopatologia, anatomia patológica, semiologia clínica e laboratorial, diagnóstico, intervenção, terapêutica, prognóstico e plano de seguimento dos principais grupos nosológicos do âmbito da cirurgia geral.

1.3 — No que diz respeito aos cuidados urgentes em cirurgia geral, a formação tem os seguintes objectivos:

1.3.1 — Objectivos de desempenho:

a) Abordagem do doente cirúrgico;

b) Técnicas de assepsia;

c) Técnicas de pequena cirurgia;

d) Emergência cirúrgica;

e) Politraumatizados.

1.3.2 — Objectivos de conhecimento — noções básicas de urgência em cirurgia geral — diagnóstico, tratamento, e encaminhamento.
Technical Graduation

VS

Scientific Training
Others of Medical internship General Surgery?
American Model

**Evaluation**
- Written exam at the end

- Oral exam
  - **Clinical reasoning**
  - Safety / Reliability of clinical decision
  - clinical trial in controversial surgical situations
  - Solving common surgical complications

If approved!
First two years

- Basic surgical training Acquisition

- Basic courses with evaluation:
  - Basic Surgical Techniques
  - Laparoscopy Basic
  - Surgical Anatomy
  - Evidence Based Medicine
  - Intensive / Perioperative Care
  - Communication
  - ATLS
“Surgical Common Branch”

1. Basic science relevant to surgical practice
2. Common Surgical Pathologies
3. Basic Surgical Techniques
4. The principles of evaluation and orientation of the surgical patient
5. Peri-operative care
6. Early assessment and treatment of polytrauma
7. Surgical care in the pediatric patient
8. Terminal patient care
9. Organ transplantation
10. Professional behavior and leadership skills
Technical Graduation

and

Scientific Training
Proposals for the Future?
- Optimization of time spent in the hospital

- Decreased “papework” or “Physician extenders”

- Time to think and build a structured reasoning

Hospital Qualified Practice
Scientific Training

Stages in a University Hospital / Laboratory (research):

- Academic / University Center
- Clinical education / Training Research
- Clinical and Experimental Research
- Scientific Methodology
Scientific Training

Residents / Surgeons (Academic Interest)

PhD Program
MINISTÉRIOS DA SAÚDE E DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR

Portaria n.º 172/2008

de 15 de Fevereiro
Esta possibilidade, que se traduz numa compatibilização entre o internato médico, por um lado, e os programas de doutoramento, por outro, visa preparar uma nova geração de médicos altamente qualificados cientificamente, que possam contribuir para uma prática clínica mais racional, para uma investigação mais competitiva e para um ensino mais exigente.
Statute of the University Hospital

When
LIVER REGENERATION AND ITS CLINICAL IMPACT

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3 – Nuclear Medicine Department, HUC, Coimbra, Portugal
Results (IV)
Results (III)

$miHR \ (n=60)$

- Pre-operative HEF (T0)  
  97.4 ± 11 %  
  (MED ± SD)

- Pos-operative 5th day HEF (T5)  
  98.8 ± 2.4 %  
  (MED ± SD)

- Pos-operative 30th day HEF  
  98.6 ± 4.7 %  
  (MED ± SD)  
  (ns)
“The failure rate of double-blind, often placebo-controlled randomized phase 3 trials is higher in oncology than in any other therapeutic area.”

NEW ANIMAL MODELS OF COLORECTAL CANCER

Terminal Colostomy descending and cutaneous-mucous fistula: n = 9

Cecostomy: n=9
Results – Molecular Imagiology with $^{99m}$Tc-MIBI

Images acquired 30 minutes after administration of $^{99m}$Tc-MIBI
(10 weeks after tumoral cells (C2BBe1) implantation).
Resultados

Colorectal carcinoma: Colostomy

Malignant tumor poorly differentiated

H/E ×40
Resultados

Colorectal Carcinoma: colostomy

Lung Metastasis

Liver Metastasis
Human Hepatocytes Transplantation

Liver biopsy

Human Hepatocytes isolation

Human hepatocytes Transplantation

New animal model with human hepatocytes

uPA-SCID
Immunohistochemical study - Clusters of Human Hepatocytes in liver of uPA-SCID mice transplanted
Metastasis - Evolution

(a) Breast carcinoma

(b) Lung adenocarcinoma

(c) Colorectal carcinoma

(Don X. Nguyen et al., 2009)
Major Hepatectomy vs Major Hepatectomy and ligation of the splenic artery

8 Weeks

n = 62 Wistar Rats

Group Hx (Major Hepatectomy - 85% ) – (n=35)

Group Hx + LAE (Major Hepatectomy and ligation of the splenic artery) – (n=27)
85% Hepatectomy (Wistar Rats)
Instituto Biomédico de Investigação em Luz e Imagem – Universidade de Coimbra

www.uc.pt/en/fmuc/ibili
THANKS YOU!
5.1.2 — Objectivos de conhecimento:

a) Objectivos gerais de conhecimento referidos nos n.os 1.1 a 1.3;

b) Anatomia cirúrgica, fisiopatologia e técnica cirúrgica, de modo especial a relacionada com o programa de desempenho do ano;

c) Cuidados pós-operatórios;

d) Interpretação de meios auxiliares de diagnóstico;

e) Ética e responsabilidade médico-legal.
Evaluation

- Evaluation during “Internato”

8.1 — Avaliação de desempenho — a avaliação será contínua e formalizada no final de cada estágio ou, no caso do estágio em cirurgia geral, em cada período de 12 meses. Todas as avaliações de desempenho incluem os seguintes parâmetros:

a) Capacidade de execução técnica — 3;
b) Interesse pela valorização profissional — 2;
c) Responsabilidade profissional — 3;
d) Relações humanas no trabalho — 2.