The UCLA Doctoring Program

Jerome R. Hoffman, MA MD
Professor of Medicine/Emergency Medicine
UCLA School Medicine
Visiting Professor
IRCME, the University of Tokyo

Need for Curricular Change

- Facts are not enough
  - They are wrong
  - They change
  - There is no one “truth”

Need for Curricular Change

- **Primacy of *skills***
  - **Critical thinking**
  - **Life-long learning**
  - **New concepts**
    - **ethics, humanism, patient-centered care**
  - **Personal and professional development**

Student Opinion

What we teach well	What we teach poorly
Treat disease	Prevent disease
Major disease mechanisms	Individual patient variation
Individual diseases	Nutrition / Aging / Human Development / DV / Law
Schizophrenia / BPD	Anxiety/ Depression / Pain
“Ethical concepts”	Approach to ethical problems

Typical US Medical School Structure

- **Year 1 and 2 : Basic sciences**
  - **By separate individual courses**
  - **Some “Introduction to clinical medicine”**
- **Year 3: Required clerkships**
  - **Internal Medicine, Surgery, Pediatrics, Ob-Gyn, Neurology, Psychiatry**
- **Year 4: Elective Clerkships**
  - **Radiology/EM/Anesthesia/Sub-specialties**
  - **Sub-internships**

Modifications at Some US Schools

- **Year 1 and 2**
  - **Some coordination of the basic sciences**
  - **Earlier introduction of FCM**
  - **Some clinical correlation**
  - **Coordinated “theme” courses**
- **Year 4**
  - **The UCLA colleges**

History of UCLA Doctoring Program

- Introduction in 1992 (with faculty buy-in)
- Introduced 1 year at a time
- Constantly changing
  - Student and faculty feedback
  - Changes in the world of medicine
  - Internal maturation
  - Changes in the “culture” of UCLA

Doctoring – Desired Content

- **Key skills for a learner / for a humanistic physician**
  - **"Everything you need that they don't teach you in traditional individual classes"**
    - **Ethics**
    - **Law**
    - **Societal issues**
    - **Doctor-patient relationship / communication**
    - **Critical analysis of information**
    - **Health-care economics**

Doctoring - Desired Process

- Active learning
- Critical thinking
- Integration into the curriculum
- Planned redundancy
- Progressive reinforcement

Doctoring - Innovations

- **Year 1 – 2**
  - Early and consistent introduction to clinical topics
  - Progressive experience with Doctoring themes and with clinical medicine
- **Year 3 ****
  - Continued SP and group experiences
  - Continued reinforcement of key Doctoring themes
  - Integration into ward experience
- **Year 4**
  - Introduction to teaching responsibilities

Doctoring 1 – Key Subjects

- Human development
- Doctor-patient relationship
- Doctor-patient communication
- Ethical concepts

Doctoring 1 – Key Subjects

- Societal context of health/ sickness/ health care
  - » Health-care economics
    - Insurance
    - Practice organization
    - Apportionment of resources (rationing)
    - "Cost-effectiveness"
  - » Legal issues
  - » Impact of drugs and alcohol
  - » Impact of poverty

Doctoring 1 – Key Skills

- **Information *gathering***
  - » **Journals, Web, Experts, Patient Groups**
- **Introduction to clinical skills**
  - » **History of present illness**
  - » **Vital signs**
  - » **Rudimentary physical examination**

Doctoring 2 – Key Themes

- More advanced approach to D1 themes
- More complex doctor-patient interactions
  - Patient requests / shared decision-making
  - "Compliance"
  - Ethical issues related to individual patients
- More advanced H&P skills
- Information *analysis* skills

Doctoring 2 – Key Themes

- Introduction to medical decision-making
  - » SPs with simple clinical problems
  - » Issues of screening
  - » Bayesian analysis of test ordering
- Basic medical issues
  - » Pain
  - » Anxiety / depression

Doctoring 2 – Key Themes

- Culture and medicine (on a societal level)
- The culture *of* medicine (mostly on a conceptual level)
  - » Role of the physician
  - » Medical error
  - » Group relationships
  - » "Professionalism"

Doctoring 3 – Key Themes

- More advanced approach to D1 and D2 themes
- More complex doctor-patient interactions
  - » Shared decision-making
  - » Angry / demanding / difficult patients
- More advanced H&P skills
  - » Areas of uncertainty
  - » Questioning dogma

Doctoring 3 – Key Themes

- **Advanced decision-making**
  - **Patient-oriented outcomes**
  - **Shared decision-making**
  - **Presentation of information**
- **Advanced critique of information**
  - **Analysis of Journal articles**
- **Medical malpractice**
- **Prescribing, and the influence of big Pharma**
- **Culture and medicine (in individual patients)**

Doctoring 3 – Key Themes

- **The Culture of Medicine – in clinical training**
  - » **Authority / responsibility**
  - » **Doctor-doctor interactions**
    - **Hierarchical**
    - **Consultants**
  - » **Working with a team**
  - » **“Gifts” and the sense of entitlement**
  - » **Error, and the culture of blame**

Content by Year

	Year 1	Year 2	Year 3
AIDS	✍	✍	✍
Domestic violence	✍	✍	✍
Substance abuse	✍	✍	✍
Geriatrics	✍	✍	✍

Content by Year

	Year 1	Year 2	Year 3
Differential diagnosis	✍	?	?
Prevention	✍	?	?
Cultural Issues	✍	?	?
Physical diagnosis	✍	?	✍
Public health	✍	?	✍
Epidemiology	✍	?	✍

Content by Year

	Year 1	Year 2	Year 3
Ethics	?	?	?
Interviewing	?	?	✍
Doctor-Pt relationship	?	✍	✍
Behavioral aspects of medicine	?	✍	✍
Life-cycle issues	?	✍	✍
Human sexuality	?	✍	✍

Doctoring: Creating a consistent learning experience with *multiple* teachers

THE FACULTY IS THE KEY

- **Who they are**
- **What they need to know**
- **What they don't need to know**
- **What their role is**

Doctoring: Faculty Development

- **Faculty development *days***
  - **Group process**
  - **Feedback**
  - **Basics of Clinical Epidemiology / EBM**
  - **Culture and Medicine**
- **Faculty retreats**
  - **End-of-life**
  - **Medical error**
  - **Physician well-being**

Doctoring: Faculty Development

- **Faculty development *hours* at each session**
  - **Review the tutor guides**
  - **Discuss the theme issues**
- **Detailed tutor guides ****
  - **Medical appendices**
  - **Case material**
  - **Key questions … and suggested approaches**

Doctoring 1: Course Structure

- Half day small group case based teaching
- Half day at a community practice
  - close, year long relationship
  - intensive supervision with feedback
  - exposure to broad case mix with continuity
  - log of all patients

Doctoring 1 – Small Group Structure

- 7-9 students / 2 tutors
  - 1 medical clinician
  - 1 mental health clinician
- 4th year “Doctoring Fellow”

Doctoring 1 - Schedule

- **Week 1: Case Introduction**
- **Week 2: Site Visit**
- **Week 3: Case Follow-Up**
- **Week 4: Preceptor Visit**

Doctoring 1 - Teaching tools

- Case-based learning
  - Standardized patients, video cases, paper cases
- Problem-based learning
  - Independent reading, web searches
- Clinical exercise (videotapes of individual students)
- Preceptor visits
- Site visits

Doctoring 1 - Group Process

- Assurance of confidentiality (unless …)
- Respect for the opinion of others
- Encouragement of universal participation
- Creation of a safe, stimulating environment

Doctoring 1 - Site Visits

- AA meeting
- Evening home visit
- Community site visit
- Hospital rounds
- Grief workshop

Doctoring 1 – Preceptors

- Experience clinical settings / Observe patient care and the practice of medicine with a faculty mentor
- Be exposed to long-term primary care that is humanistic and patient-centered
- Have some opportunity to interview patients, and practice taking vital signs and performing portions of the physical examination

Doctoring 1 – Limited Physical Exam

- Formal training
- Yearlong practice, with direct observation by preceptor
- Ethical issues / informed consent
- Professionalism

Teaching tools – the Arts

- Culture of Medicine
  - The Doctor
  - Hospital
  - William Carlos Williams
- Aging: Awakenings
- Cancer/ EOL: Wit
- Parent-child: Kramer vs Kramer (Ran)

Doctoring 1 - Evaluation

- Tutor evaluation (on-going)
- Group evaluation (mostly implicit)
- Self-evaluation
- Preceptor evaluation
- Patient feedback
- Videotaped clinical exercise
- Examination (?)

Doctoring 1 - Student Feedback

- Each small group chooses a student representative to meet with the course Directors once or twice each semester
- On-line evaluations of all components of the course are gathered throughout the year
- Students are encouraged to let the course Directors know of any problems or concerns.

Doctoring 1 - Student Feedback

- **We can and do make changes in the course every year, including during the year, when necessary and feasible**
- **Students often disagree among themselves. We will address any aspects of the course that are of concern to any subset of the class, but will not always make the requested changes.**

Doctoring 1 - Course Objectives

Knowledge

“What every doctor needs to know”

- **Health Behavior**
- **Human Development**
- **Medical Ethics**

Doctoring 1 - Course Objectives

- **Skills**
  - **interviewing / taking a medical history**
  - **group process**
  - **problem-solving / life-long learning**

- **Familiarity** with clinical practice

Doctoring 1 - Topics

- Behavioral Medicine
- Medical Ethics
- Cultural, Ethnic and Gender Aspects of Medicine
- Legal Issues in Medicine
- Substance Abuse

Doctoring 1 - Topics

- Healthcare Economics
  - Access to Care
  - Health Insurance
  - Rationing
  - Legal aspects
- Prevention and Health Maintenance
- Human Development and Life Cycle

Doctoring 1 – A Different Point Of View

I never gave them a proper a burial. I don't know where they are. They were cremated. They decided, God knows why, that they would donate their bodies to science. We had no idea why.

But all of a sudden the orders were there – at some point they were picked and brought to this or that medical school, where they were used for God knows what…

Eggers, A Heartbreaking Work of Staggering Genius

Doctoring 1 – A Different Point Of View

No, I know I won't find their bodies – they were cremated – but I have long dreamed… of coming closer… I want to see the face of the doctor or whoever who used my parents as cadavers.

I have images in my mind: a great room, floors shiny, stainless steel tables, machines for picking and drilling and extracting, and there are medical students, five to a table, spread out …

God knows what they do with cancer-ridden bodies– if they're used as case studies or examined for their parts, like rusted cars on blocks, stripped …

Eggers, A Heartbreaking Work of Staggering Genius

Doctoring 1 – A Different Point Of View

So I plan to go to the medical school, and find the teacher who was in charge, and I will knock on his door… I only want to take a look at the man. Offer greetings. I want him to be shorter them me, frail, bald, with glasses. I want him to be dumbstruck by my introduction, afraid for his life …

I will close in on him, all casual confidence, and will ask something like:

"So tell me. What did it look like?"

"Excuse me?" he'll say.

Eggers, A Heartbreaking Work of Staggering Genius

Doctoring 1 – A Different Point Of View

"Was it like caviar? Or empty, like a dried gourd? See, I have a feeling it might have been like a dried gourd, empty and light, because when I carried her, she was so light, much lighter than I expected …So which was it? Was it the dried gourd, or the festering cabal of tiny gleaming pods?"

"Well…"

"I have been wondering for many years."

He will tell me. And I will know.

Eggers, A Heartbreaking Work of Staggering Genius

Doctoring 1 - Adolescence

What would you want to teach…and how

- **Normal development / behavior**
- **Confidentiality**
- **Sexuality**
- **Drug use / Risk-taking**
- **Depression**

Doctoring 1: Adolescent Case

Teenager who faints in class

- Pregnancy (EP) / sexuality / STDs
- Drug use
- Anorexia/Bulimia
- Depression
- Privacy (including legal issues)

Doctoring 1: Adolescent Case

Teenager who faints in class

- 2/3 of sexually active girls do not regularly use contraceptives
- 8% of all 15-19 year old females become pregnant each year
- 1 in 5 high school seniors smokes cigarettes daily
- 1 in 5 high school students used MJ in preceding month and 1 in 3 used alcohol > once a month

Doctoring 1: Using the Web

Questions one needs to be able to answer

- Where can I get a patient get an abortion? What does it involve? What does it cost? Who pays?
- How can a patient put a baby up for adoption? What is the difference between using an adoption agency or a private adoption?

Doctoring 1: Using the Web

- **Questions one needs to be able to answer**
  - **What help can an unwed teen get help if she keeps her baby? What about school? Healthcare? Child-care?**
  - **What are the most common STDs in teenagers and how are they prevented and treated?**

Doctoring 1: Child with Cancer

What would you want to teach … and how

- What a child already knows
- What a child understands
- Giving bad news (especially to a child)
- Explaining disease / treatment / prognosis

Doctoring 1: Child with Cancer

What would you want to teach…and how

- Dealing with pain
- Psychological impact of disease
- CAM
- Role of the family
- Role of the physician:

  what you can do, and what you cannot

Doctoring 1: Giving Bad News

- What do I say to Maritza? I don't want to upset her, but she is asking a lot of questions, and I don't know how to answer. How much does she really understand?
- Maritza sometimes says she doesn't want to take her medicine. I can talk her into it, but sometimes she says she just wants to die. She can't refuse treatment, can she?

Doctoring 1 - Giving Bad News

- How can I help Maritza with her spinal taps and bone marrows? She gets so scared and it looks like it really hurts.
- What is this going to mean for her long-term, psychologically?
- What about her mother?

Doctoring 1 - Giving Bad News

- **Maritza's cousin is having problems in school. Why is he being so difficult now, when we need his help?**
- **The rest of the family wants to call in a curandero. Would it be OK? Could we give her some treatments?**

Doctoring 1: Health-Care Economics

- **What would you want to teach … and how**
  - **Ethical issues related to treating poor and uninsured patients.**
  - **Availability of services, including health care, for the homeless**
  - **Immunizations and preventive care for children**
  - **Effect of homelessness on health and health care**

Doctoring 1: Substance Abuse

- **What would you want to teach…and how**
  - **Definition. epidemiology and risk factors**
  - **How to recognize / CAGE questionnaire**
  - **Non-judgmental approach**
  - **Role of the Physician**
  - **Treatment programs available**
  - **Relation to suicide**
  - **Physician impairment**

Doctoring 1 – Aging

- **What do you want to teach…and how**
  - **The elements of normal physical and cognitive aging.**
  - **Options available for long term care of elderly patients, and how they are financed**
  - **The relation between normal cognitive aging and various causes of dementia, and how to differentiate between them**
  - **Ability to perform a mini-mental status exam and an assessment of activities of daily living**
  - **Effective ways to interact and communicate with older patients.**
  - **The impact on the family of caring for an elderly relative**
  - **Advance directives, and how to discuss them with a patient**

Doctoring 2 – Key Themes

- More advanced approach to D1 themes
- More complex doctor-patient interactions
  - Patient requests / shared decision-making
  - "Compliance"
  - Ethical issues related to individual patients
- More advanced H&P skills
- Information *analysis* skills

Doctoring 2 – Key Themes

- Introduction to medical decision-making
  - » SPs with simple clinical problems
  - » Issues of screening
  - » Bayesian analysis of test ordering
- Basic medical issues
  - » Pain
  - » Anxiety / depression

Doctoring 2 – Key Themes

- Culture and medicine (on a societal level)
- The culture *of* medicine (mostly on a conceptual level)
  - » Role of the physician
  - » Medical error
  - » Group relationships
  - » "Professionalism"

Doctoring - Standardized Patients

- Trained actors with basic script guidelines
  - Medical facts of the case
  - Social facts
  - POV/ attitudes
  - Questions / goals re the physician encounter
  - Responses to various archetypal interviews

Doctoring – Standardized Patients

- Uniform and consistent teaching tool
  - Can raise consistent topics / issues
  - Can elucidate particular communication/ ethical/
  - interpersonal issues
- Non-threatening
  - Safe for the learner
    - » "Time-Outs"
    - » "I don't know"
  - Safe for the "patient"

Doctoring 1 - SP Interviews

- **Multiple common problems, but all SPs have different personalities, and react differently to the interviews**
  - **Different desires for information**
  - **Different wish for shared decision-making**
  - **Different personality**
  - **Different cognitive / economic resources**

Doctoring 1 - SP Interviews

- One time (only!) demonstrate interview/ brief case presentation.
- Have students practice giving feedback, and discuss strengths and weaknesses of the interview. Have them practice giving real and constructive feedback.
- From this point on, tutors will not demonstrate, but call time-outs, moderate discussions, provide feedback.

DV1 Tutor Guide – Introduction

- **DV recently recognized as a major threat … crosses demographic and socioeconomic lines …**
- **It is estimated that 2-4 million women are severely physically abused each year …**
- **No single approach … the medical profession and clinicians must play a far larger role ...**
- **Unfortunately, substantial evidence that physicians are not fulfilling this essential role...**

DV1 Tutor Guide: Introduction

- In 1994, > 50% of graduating medical students rated instruction in DV inadequate
- This compares with 5% who rated their education in the basic sciences as inadequate.

This module is designed to begin to remedy this deficiency.

DV1 Tutor Guide: Context

As with any challenging psychosocial situation (homelessness, teen pregnancy, etc), students need to realize that, as physicians, they cannot be expected to *solve* all their patients' problems.

DV1 Tutor Guide: Context

But awareness … is essential …. without this, in the case of Rita Baron, physicians will simply continue to treat her injuries, until the day her "accidents" are beyond treatment.

DV1 Tutor Guide:
Learning Objectives - Knowledge

- Understand societal & legal definitions of DV
- Recognize prevalence … how frequently women seek medical care … how frequently physicians miss this diagnosis
- Identify predisposing and predictive characteristics of both victims and abusers

DV1 Tutor Guide:
Learning Objectives - Knowledge

- Recognize common signs, symptoms, "stories," red-flag indicators of abuse
- Describe reasons why a victim may not recognize a relationship as abusive
- Describe reasons a victim may be reluctant to disclose DV or seek help

DV1 Tutor Guide:
Learning Objectives - Knowledge

- Identify reasons why a victim may remain in an abusive relationship
- Identify question for screening / diagnosis
- Describe reasons physicians avoid asking
- Identify legal reporting requirements, and their impact on doctor-patient confidentiality

DV1 Tutor Guide:
Learning Objectives - Knowledge

- Necessary elements in documentation
- Community resources and legal recourse available to victims
- Ways to increase the victim's safety

DV1 Tutor Guide:
Learning Objectives - Skills

- To be able to conduct a sensitive, empathetic, detailed history when domestic violence is suspected.
- To be able to conduct a sensitive screening history for domestic violence even when it is not suspected.
- To develop basic approach to intervention.

DV1 Tutor Guide:
Learning Objectives - Attitudes

- Appreciate the central role physicians may play in helping victims of DV.
- Feel a personal responsibility to identify … and intervene appropriately.
- Appreciate the need to screen for DV.

DV1 Tutor Guide

Video: “A Couple’s Visit”

Begin discussion with broad questions:

- **What were your impressions?**
- **Did the physician handle the situation appropriately?**
- **What could he, or should he, have done differently?**

DV1 Tutor Guide: Video

How is domestic violence defined?

- **Societal definition:** victimization; either physical, sexual or psychological abuse of a person with whom the abuser has or has had a romantic or an intimate relationship.
- **Legal definition:** varies by state -- The California Penal Code (Section 13700) defines …

DV1 Tutor Guide: Video

- **Why did the physician pursue the diagnosis of an eating disorder rather than...?**
- **Why might physicians not ask about DV?**
  - » inadequate training
  - » feeling uncomfortable asking “sensitive” questions
  - » fear of causing offense
  - » close identification with patients
  - » feelings of powerlessness, and lack of control
  - » time constraints of practice

DV1 Tutor Guide: Invent a DV Interview”

- Rather than tell students … encourage discussion of what *they think* should be included
- Keep in mind: not all abuse will be obvious, *and* not all injuries will be abuse -- how do physicians ask, without insulting, if it’s not abuse, but also get the patient to open up if it is?
- Encourage discussing of stereotypes inherent in considering abuse (all abusers are male, abuse does not occur in gay and lesbian couples, etc)

DV1 Tutor Guide: Interview Questions

(some for screening, others if DV is suspected)

- **Have you ever been physically hurt or threatened by your partner?**
- **Are you in a relationship in which you feel unsafe? In what ways?**
- **Has your partner ever destroyed things that you cared about?**

DV1 Tutor Guide: Interview Questions

(some for screening, others if DV is suspected)

- **Has your partner ever threatened or abused your children?**
- **Has your partner ever forced you to have sex when you didn't want to, or that makes you feel uncomfortable?**
- **What happens when you and your partner fight or disagree?**

DV1 Tutor Guide: Interview Questions

(some for screening, others if DV is suspected)

- **Do you ever feel afraid of your partner?**
- **Has your partner ever prevented you from leaving the house, seeing friends, getting a job, or continuing your education?**
- **How does your partner act when drinking or on drugs?**
- **Do you have guns in your home?**

Additional Reference on "SAFE," in Appendix

DV1 Tutor Guide: SP Interview

- CC: 28yo female with c/o painful R forearm after FOOSH. She is well-dressed, and presents in the company of her husband and 2 small children.
- HPI: “Tripped and felled last evening.”
- P Ex: Swelling/ tenderness/ ecchymosis to ulnar aspect of distal third of forearm.

DV1 Tutor Guide: SP Teaching Points

- “Red flag” presentations / injury patterns
- Screening vs diagnosis
- Confidentiality / privacy
- Safety issues
- Legal issues

DV1 Tutor Guide: SP Interview

Even though the students know the topic, they can't just launch into questions regarding DV -- they must through a general interview and establish rapport in order to develop trust.

DV1 Tutor Guide: SP Interview

Take "time-outs" to discuss both content and process of the interview:

- **"What have we learned?"**
- **"What is working well in the interview?" (clarity of questions, eye contact, body language, sense of support)**
- **"Should anything be done differently?"**
- **"What should be asked next?"**

DV1 Tutor Guide: Intervention

- Care for her physical injuries.
- Address safety issues
- Address reporting issues
- Provide resources
- Discuss safety plan

DV1 Tutor Guide: Approach

- Normalize questions
  - "We ask routinely…"
  - "I see many patients with …"
- "Compassionate inquiry"
  - Non-judgmental
  - "No one deserves …"

DV1 Tutor Guide: Approach

- Do not be discouraged
  - Most abused women require multiple contacts (as in many medical situations)
- Just because you can't do everything … do what you can
  - Treat injuries
  - Provide information
  - "If you change your mind …"

DV1 Tutor Guide: Reporting

What legal and ethical reporting responsibility - with known abuse? with suspected abuse?

- California state law:
  - **Reporting requirements**
  - **Issues of confidentiality**
- **Other state laws**
- **Ethical consequences**
- **Practical consequences**

DV1: Mandatory Reporting

Pros

- Increased societal awareness
- Increased MD awareness
- Increased societal commitment
- Holds perpetrator responsible
- *Could* increase safety (no evidence)

Cons

- Deterrent to seeking care
- Deterrent to acknowledging DV
- Threat to privacy/ confidentiality
- Threat to patient autonomy (contrast with child abuse)
- Makes promises that may not be possible to keep
- May decrease safety (evidence of increased retaliatory violence)

DV1 Tutor Guide: Next Class

- Distribute student guides
- ASSIGNED READINGS
  - **ALL STUDENTS:**
    - **"California's mandatory reporting of domestic violence injuries: does the law go too far or not far enough?," WJM, 171, 118-124.**
    - **"Mandatory reporting: the view from the community," WJM, 171, 125-126.**
  - **ONE STUDENT EACH** (to lead the related discussions at next class):
    - **Booklets from the American Medical Association:**
      - **"Diagnosis & Treatment Guidelines on Child Sexual Abuse"**
      - **"Diagnosis & Treatment Guidelines on Elder Abuse and Neglect"**
      - **"Diagnosis & Treatment Guidelines on Child Physical Abuse and Neglect"**

DV1 Tutor Guide - Appendix

- SAFE Questions
- **Important Considerations in DV Cases**
- **Reporting Procedure**
- **Mandatory Reporting Law – Summary**
- **Legal Options for Victims of DV in California**
- **Sample Safety Plan**
- **Women's Survival Guide**

Clinical Epidemiology

- **Clinical reasoning**
  - **Pattern recognition**
  - **Hypothesis testing**
  - **Test characteristics**
  - **Criterion standards**
  - **Bayesian thinking**
  - *Critical evaluation of the above*

Clinical Epidemiology

- **Basic statistical concepts**
  - **Rationale for clinical research**
  - **Rationale for statistical testing**
  - **p-values and role of chance**
  - **Confidence intervals**
  - **Types of error**
  - *Critical evaluation of the above*

Clinical Epidemiology

- **Clinical research**
  - **Types of studies**
  - **Internal / external validity**
  - **Types of analysis**
  - **Meta-analyses and systematic reviews**
  - *Critical evaluation of the above*

Clinical Epidemiology - Bias

- Selection bias
- Confounding
- Measurement bias
- Spectrum bias

Clinical Epidemiology

- **Presentation of data**
  - **Rates and Proportions**
  - **Presentation of Risk**
    - **Relative risk**
    - **Absolute risk**
    - **NNT-benefit / NNT-harm**

Clinical Epidemiology

- **Interpretation of data**
  - **Appropriate and inappropriate extrapolation**
  - **Misinterpretation of statistical findings**
  - **Influences on data analysis**

Clinical Epidemiology

- **Screening**
  - **Fundamental distinction from diagnosis**
  - **Potential impact: positive and negative**
  - **Conditions requisite for utility**
  - **Analysis of impact (and special biases)**

Clinical Epidemiology

- **Ethics/conflicts of interests in research**
  - **Informed consent**
  - **Placebo controls**
  - **Proprietary (pharmaceutical) sponsorship**

Clinical Epidemiology

- **Evidence Based Medicine**
  - **What it is**
  - **Why it's important**
  - **What innovations it brings**
  - **How we can use it**
  - **Why it is also not "the truth"**