NASPGHAN/NESTLÉ NUTRITION INSTITUTE

FIRST YEAR PEDIATRIC GASTROENTEROLOGY FELLOWS CONFERENCE

JANUARY 13 – 16, 2011

Course Director: Vicky Ng, MD and Co – Director: Daniel Kamin, MD
Dear Pediatric GI Fellows:

On behalf of NASPGHAN and the Nestle Nutrition Institute, a warm welcome to The Hilton Fort Lauderdale Beach Resort in sunny Ft. Lauderdale, Florida!

We remain thrilled that NASPGHAN and the Nestle Nutrition Institute have continued to partner over the last 9 years to bring together all the 1st Year Fellows of our North American Pediatric GI community. This year, we have a record number of 109 first year fellows, and 15 faculty members! We are most pleased that with each year, the membership of our 1st Year Fellows continues to grow – truly reflecting a positive effect you are having on your profession and future.

The goals of this conference are:

1) To help you all develop strategies to get the most out of your fellowship training, with a particular focus on the choice of scholarly activities to pursue during the 2nd and 3rd fellowship training years;
2) To introduce you to the various career paths available in our Profession, and start you thinking about what makes the most sense for you;
3) To encourage a healthful approach to work and life balance, particularly the personal and professional issues that can contribute to burnout during fellowship; and
4) To introduce you all to the larger pediatric GI community.

This is also a great opportunity to meet your peers and a rich variety of NASPGHAN faculty. We encourage you to take full advantage of this unique opportunity. Indeed, many of those whom you meet in these three days will become not only future colleagues, but future mentors, collaborators, and life-long friends.

A full agenda has been carefully planned, and we hope the next 3 days will not only be educational and instructive, but will also transmit the enthusiasm of the great faculty who have come together. We hope you take back home with you new ideas, new tools with which to examine them, and the exciting beginnings of a professional network of creative, budding gastroenterologists.

So........get ready for some candid conversations, frolicking fun, and fantastic food!

Sincerely,

Vicky Ng, MD
José Saavedra, MD
**2011 First Year Pediatric Gastroenterology Fellows Conference**

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Thursday, January 13

16:00  Faculty Briefing  
       Vicky Ng/Daniel Kamin/Alan Leichtner  

18:00  Reception  

18:30  Dinner - Seating in Groups –Welcome/Opening Remarks  
       Pepe Saavedra/Vicky Ng  

19:30  Introductions  
       Faculty Leaders  

20:00  GI Quiz Show – “Getting to Know You Exercise”  
       Greg Kobak/Elaine Moustafellos/Alan Leichtner  

21:00  Goodnight!

Friday, January 14

07:30  Breakfast  

08:00- 12:00  Session 1: Designing and Implementing Research Projects  
              Moderator – Vicky Ng  

08:10  “Choosing a Research Topic”  
       Manu Sood  

08:30  “Designing a Research Project”  
       Joshua Friedman  

08:50  “Introduction to Research Ethics”  
       Daniel Kamin  

09:10  “Writing and Presenting an Abstract for a National Meeting”  
       Valeria Cohran  

09:30  Nutrition Break  

09:45  Introduction to Clinical Research Exercise  
       Daniel Kamin/Vicky Ng  

10:00  Clinical Research Exercise
12:00  **Lunch with Presentations: “So You Think You Can Present?”**  
Hosts: Vicky Ng/Daniel Kamin  
Judges: Manu Sood/Valeria Cohran/Joshua Friedman

14:00  Group Picture

14:30  Group Activity: “Sand Castle Building”

18:00  Reception

18:30  **Dinner – Self-Seating/Fellows Choose Tables:**
1) Private Practice  
2) Scientist Track  
3) Educator Track  
4) Clinical Investigator/Translational Researcher Track  
5) Administrator Track  
6) Medicine in Industry

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**Saturday, January 15**

09:00  Breakfast with NASPGHAN & CDHNF  
Maria Perez and Kathleen Schwarz

**10:00-12:00**  **Session 2: How to Approach Challenges and Seize Opportunities During Your Fellowship**  
**Moderator – Daniel Kamin**

10:05  “Getting the Most Out of Your Fellowship”  
Vicky Ng

10:25  “Choosing a Mentor”  
Peter Lee

10:45  “How to Critically Appraise the Literature You Read”  
Wallace Crandall

11:05  **Nutrition Break**

11:20  “Giving a Great Teaching Talk”  
Michael Narkewicz
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<td>“Recognizing Burn Out During Fellowship”</td>
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<td>12:15</td>
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<td><strong>Dinner and Awards</strong></td>
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**Sunday, January 16**

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How to Choose a Research Project

Manu R. Sood
Director of Motility & Functional Bowel Disorders Program
Medical College of Wisconsin, Milwaukee

Goals and Objectives

Goal: Enhance your understanding of what constitutes a good research project and how to go about finding one

Objectives: You should be able to...
1. Identify the three critical components of a good research project.
2. Know the appropriate steps to take in order to find a good and successful project.

Why Do Research?

Opportunity to answer questions
Expectation of the training program
Develop skills in critical thinking which are always useful
Keys Points to Choosing a Research Project

- People to help guide you
- The research project is of personal interest
- Find a defined “do able” project
- The project should be worth doing
- Balance your ideas and independence with those of others

Decide what area or field you want to focus on

Previous experience
Career goals
Mentor & support

Watch out for the aggressive salesperson

Past performance is a good predictor of future success
Never let anyone pressure you into a research project

What makes a good research project?

- First and foremost, it must be interesting
- You should learn something of value
  - A technique, methodology, a way of approaching problems, something you can take with you
- It should be productive
  - There should be a reasonable chance of answering your question and publishing it
- Fits your career goal

Pathways

- Clinical Research
  - Clinical trials
  - Observational studies
- Basic science
- Population science
- Translational science
Choosing a mentor

1. Meet with possible mentors, ask questions of others who have worked with them
2. Choose a mentor based on:
   a. Past record, first and foremost
   b. Potential projects, second

Remember: One size does not fit all

What to do in the first six months of your fellowship

1. Speak to potential research mentors
2. Identify possible projects (2-3 max)
3. Read about the topics and identify what you would enjoy and fits your career goal
4. Clearly define your goals

By the end of first year

- After you have chosen a mentor, then...
- Develop a research question
  - Do a thorough search of medical literature
  - Identify the edge of knowledge related to that question and gaps in knowledge
  - Be certain that your question has not already been answered AND that filling the gaps is important
  - In other words, if you already knew the answer to your question, would anyone care?
- Develop a testable hypothesis
Study design

Relevant to Your Career Goals

Stay Focused

How will you be judged

- Level of involvement
  - Were you involved in developing the concept, analyzing data, writing manuscript?
  - Were you just a data collector?
- How productive was it?
  - Did you produce an abstract, manuscript, present at meetings, etc.
- Extent of commitment to research
**Do’s and Don’ts**

**Do:**
- Focus on the mentor
- Articulate research question
- Literature search
- Stay focused, don't stray
- Make sure project is achievable

**Don’t:**
- Choose a mentor just because you like them
- Make assumptions
- Study something in which your mentor does not have expertise
- Take on a project that is not well developed

**Summary**
- Good research projects are interesting, educational, and productive
- The fit with your career goals
- Identify a mentor first, then the project—good mentors are invaluable
- Focus on developing a research question and then identifying gaps in the knowledge
- Be certain that someone will care if you are able to fill that knowledge gap
The art and science of asking questions is the source of all knowledge

Thomas Berger
Designing a Research Project

Joshua R. Friedman, M.D., Ph.D.
Assistant Professor of Pediatrics
The Children’s Hospital of Philadelphia
The University of Pennsylvania School of Medicine

Overview

• General Research Question
• Hypothesis
• Specific Research Questions
• Study Strategy

Research types

Basic Research  Translational Research  Clinical Research
What Makes a Successful Research Project?

FINER

- Feasible
- Interesting
- Novel
- Ethical
- Relevant

Feasible

- Is the question answerable?
- Do you have access to all the materials needed for the study?
- Will you have enough time and money?
- Do you or your mentor have the expertise to complete the study?

http://www.fmdrl.org/group/index.cfm?event=c.showWikiPage&pageId=473
Interesting
- Are you interested in the study?
- Will others be interested in your results?

Novel
- Has the study been done before?
- Will the study add new information?

Ethical
- Can the study be done in a way that does not subject subjects to excess risks?
**Relevant**

- Will it further medical science?
- Will the results change clinical practice, health policy, or direct new avenues of research?

**Overview**

- General Research Question
- Hypothesis
- Specific Research Questions
- Study Strategy

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**Diagram**

```
Research Topic
  ↓
General Research Question
  ↓
Hypothesis
  ↓
Specific Research Questions
  ↓
Study Strategy
```
General Research Question

• Derives from the research topic
• Broadly encompassing question
• Allows you to generate a hypothesis

General Research Question Development

• Literature Review
  – Identify related research
  – Define gaps in current knowledge base
  – Avoid redundancy
  – Set your research within the proper context

Tip

At the start of your research project, identify “model” articles...use these as guides in the design of your research project.
### General Research Question Development

- Discuss with Mentor and Other Experts
  - Unpublished work
  - Recent discussion at meetings
  - “Common” knowledge
  - General & specialty interest in the field

### General Research Question

- Be prepared to justify with published evidence to support
  - Why is it a good idea?
  - Why is the research worth doing?
- Consider the consequences if the research is positive, negative, or inconclusive
- Will others be interested in this work?

### General Research Question

- Expresses curiosity about the relationship between two (or more) phenomena
- Describes a population under study
**General Research Question**

Does drinking coffee improve the procedural skills of pediatric gastroenterology fellows?

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**Formulating a Hypothesis**

- Formulation of the hypothesis comes after you have had the idea for the research, performed a careful and thorough literature review, and generated a general research question.
  - Puts the research into focus
  - Leads directly to study design
What is a Hypothesis?

• A statement derived from the general research question that is used as a basis for argument

• A statement that can be tested

• Essential part of statistical inference

Formulating a Hypothesis

• Use prior evidence
  – Clinical observation
  – Published literature
  – Basic biomedical (mechanistic) understanding
  – Preliminary research data

Formulating a Hypothesis

• Good hypotheses
  – Make a prediction
  – Specify independent and dependent variables
  – Specify effects of independent variables on dependent variables
Formulating a Hypothesis

- Consists of two competing claims:
  - Null hypothesis (H₀) - negation of the research question of interest
  - Alternative hypothesis (H₁) - acceptance of the research question of interest

Null Hypothesis

- Important in statistical testing – receives special consideration
- Must be disproved statistically
- Cannot be rejected unless the evidence against it is sufficiently strong
- Reject H₀ in favor of H₁ or Do not reject H₀
- Never Reject H₁ or Accept H₁

Hypotheses

Good hypotheses
- Specific
- In advance
- Simple
- Null is stated

Bad hypotheses
- Vague
- After the fact
- Complex
- No clear null
Tip

Look down the road; don’t formulate a hypothesis that will lead to a type of research you cannot or do not want to perform.

Hypothesis

Does drinking coffee improve the procedural skills of pediatric gastroenterology fellows?

The amount of coffee consumed prior to performing endoscopy by pediatric GI fellows increases the rate of success of the procedure.

Null Hypothesis

The amount of coffee consumed prior to performing endoscopy by pediatric GI fellows does not increase the rate of success of the procedure.
Example

Does drinking coffee improve pediatric GI fellows' ability to perform endoscopic procedures?

Can beer be considered a clear liquid during a colon preparation?

Specific Research Questions

- What are the specific research questions that need to be answered in order to support or reject the null hypothesis
- Can be answered with: Yes, No, or by a Figure
- Sufficient detail to make the study strategy and analysis obvious
- No more than 3 questions
Specific Research Questions

The amount of coffee consumed prior to performing endoscopy by pediatric GI fellows does not correlate with the rate of success of the procedure.

1. Does the volume of coffee consumed affect the success rate of EGD or colonoscopy?
2. Does the length of time the coffee was consumed prior to the procedure have an effect on the rate of success?

Study Strategy

- Specific Research Questions should lead to the study strategy
  - observational study vs. interventional Study
- How can the questions be answered?
**Study Strategy**

- Define: Subjects, Interventions, Controls, Outcomes of Relevance
- How can the questions be answered?

**Measurement**

- Moves the hypothesis from concepts to concrete data
- Define or assign numbers to the concepts under study
- Organizes data collection

**Measurement**

- Coffee consumption -- ounces of coffee
- Success rate -- time of procedure in minutes, intubation of the terminal ileum
Study Strategy – Statistics

• Consult with a statistician
  - at the outset of the study design process
• Discuss study design
• Types of statistical tests
• Power of study
• Sample size

Study Strategy

• Is the strategy feasible?
  – Time
  – Money
  – People
  – Equipment
  – Patient population
  – Animal resources

• Consider alternative strategies
  – List advantages and disadvantages

Study Strategy - Ethics

• Don’t leave ethical considerations as a last step item
• Protection of Participants
• Informed Consent
Study Strategy – Formalized Protocol

• Written study plan, detailed
• Without a protocol research can become an unguided exercise in data collection
• Necessary for a study to be replicable

Formalized Protocol

• Background and Rationale
• Hypothesis
• Objectives – Specific Research Questions
• Research Design
• Study Flowsheet/Timeline
• Methods
  – Patient Population
  – Enrollment criteria
  – Recruitment Plan
  – Sample Size
  – Intervention
  – Outcome measurements
  – Data Analysis & Statistics
• Human Subjects Protections
  Consent Procedures

Tip

Have your statistician review the final protocol!
Research Study Design

- Iterative process
- Re-examination at each step of the process
- May need to back track and rework
- May need to abandon project
Objectives

- Key Historical Documents
- Underlying Ethical Principles
- Difference between clinical care and research
- Difference between children and adults
- Heuristic for determining ethical adequacy of a research study

The Pediatric Dilemma

‘We want children to benefit from the dramatic and accelerating rate of progress in medical care that is fueled by scientific research. At the same time, we do not want to place any children at risk of being harmed by participating in such research, even though their very involvement may be essential to improving the overall medical care of children’

Richard Behrman, IOM 2004
Key Documents in Research Ethics

- Nuremberg Code (1949) – informed consent in research
- WHO Declaration of Helsinki (1964) – pediatric research and direct benefit
- Belmont Report (1978) – US gov’t effort to codify the ethical conduct of research
- IOM review of Subpart D (2004) – clarify meaning of key concepts and optimal procedures for recruitment in pediatric research

Adequate Balance in Pediatrics--Given Limited Autonomy

Special attention to beneficence and justice is necessary because:
- autonomy is compromised (at least legally, often ethically)
- parents give permission but this is not the same as consent

Belmont Report: Autonomy

- Greek autos (‘self’) nomos (‘rule’)
- Respect for Autonomy promotes self-rule that is free from controlling interference by others and from certain limitations such as inadequate understanding that limits meaningful choice
- Fundamental tenet: extensive informed consent procedures, independent research subject advocates
Consent
• The ethical and legal requirements of consent have two aspects:
  • Provision of information:
    • Purpose
    • Methods
    • Demands
    • Risks, inconveniences, discomforts
    • Possible outcomes of the research, and implications
  • Exercise of a voluntary choice to participate.

Belmont Report: Beneficence
• Hierarchy of obligation:
  1. prevent harm
  2. remove harm
  3. promote our patient’s or patients’ welfare
• Pediatricians are familiar with the duty to promote the welfare of our patients, sometimes in spite of parents’ wishes
• Children are ‘vulnerable’: necessity for special protections as research subjects

Belmont Report: Justice
• Most complex and philosophically rich concept
• Justice ≜ Fairness
• Fairness achieved when equals are treated equally, and unequals are treated unequally
• Problem: how do we gauge equality, and who does the gauging?
  • A nice gloss: Research methods should not favor or disfavor people on the basis of gender, race, class, socioeconomics, religion, sexual orientation, unless that characteristic is a fundamental variable in an otherwise scientifically and ethically valid investigation
Autonomy vs Beneficence in Research

Parental consent in paediatric clinical research

H Chapin, F Dee, S Bienahe, J-C Genet, G Pen, J-M Tullinger

 Aim: To assess parental understanding and maximization of the ethical issues when obtaining the consent of a child’s participation in clinical research, and to identify the factors that influence parental decision-making.

Methods: Forty-eight parents were approached for obtaining their child’s participation in a clinical trial. Their understanding was measured by a series of questions related to the ethical issues involved in clinical research.

Results: The ethical issues included the risks/benefits, the child’s autonomy, the informed consent process, and the benefits to the child. The majority of parents (63%) understood the risks/benefits, but only 18% understood the child’s autonomy. The informed consent process was also poorly understood by the parents. The benefits to the child were understood by 75% of the parents.

Conclusions: Many parents not understand the basic elements of the consent. Based on these principles, there are ‘rules’ that guide researchers to construct ethically permissible scientific investigations.

Many parents not understand basic elements of the consent

28/68 (41%) parents let physician decide if child should participate

1. Challenge to achieve pure autonomy
2. Trust in physicians important to parents
3. Even greater burden on physicians/scientists/IRBs to protect a child/children/community from unexpected but unreasonably predictable harm

Based on these principles, there are ‘rules’ that guide researchers to construct ethically permissible scientific investigations.
Clinical care or research?

- Sometimes activity is easily classifiable, sometimes it is not
- Belmont Report
  - **Research**: 'an activity designed to test a hypothesis, permit conclusions to be drawn, and thereby develop or contribute to generalizable knowledge'
  - **Practice**: 'interventions that are designed solely to enhance the well-being of an individual patient that have a reasonable expectation of success'

Clinical care or research?

- **Why Does it Matter?**
  - When we do research, we have a conflict of interest
    - Do what is good for the study
    - Do what is good for the patient
  - Rules and oversight (IRBs) to help prevent the conflict from causing harm, and eroding trust in the system

Children versus Adults

- **Adults**: risks in proportion to benefits and to the value of the generalizable knowledge; no absolutes and not necessarily about subjects’ own conditions
- **Children**: protection from more than minimal risk—absolute risk categories
  - (i) expectation of direct benefit to subjects; or
  - (ii) advancing the general knowledge about subjects’ condition
More than minimal risk

• Children participate after (i) adequate assent/permission, but, if (ii) risk more than 'minimal'
  – harms must be balanced by prospect for direct benefit to subjects; or,
  – harms must represent only minor increase over minimal risk AND the research ought to yield vital knowledge about subjects' condition

Pediatric Risk Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Prospect of Direct Benefit</th>
<th>No Prospect of Direct Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal Risk</td>
<td>Risk is justified by the benefits</td>
<td>Risk is justified by the benefits</td>
</tr>
<tr>
<td>Minor Increase over Minimal Risk</td>
<td>Risk/benefit is as favorable as alternatives</td>
<td>Risk/benefit is as favorable as alternatives</td>
</tr>
<tr>
<td>Greater than Minor Increase over Minimal Risk</td>
<td>Vital knowledge re: subjects' disorder</td>
<td>Vital knowledge re: subjects' disorder</td>
</tr>
</tbody>
</table>

Categories refer to sections in Subpart D of 45 CFR 46

Ethical Adequacy in Pediatric Research: A Method

• Each of the Belmont Principles maps (more or less) to particular rules and regulations
• Consider each principle a ‘prism’ through which a protocol must pass
• Beneficence–harms and benefits
• Autonomy– considerations for adequate assent/permissions, avoidance of coercion
• Justice–fair access or avoidance of overrepresentation (intended or unintended)
The Model

Beneficence
- Harms - Minimal risk - More than minor increase
- Benefits - Direct Benefits - Knowledge about subject condition

Respect for Autonomy
- Assent - Developmental sensitivity - Attest to respect for developing autonomy
- Permission - Parents know what is best for own children - Legal and moral responsibility

Benefits and burdens of research ought to be shared fairly

Justice

Prism One - Beneficence

- Minimal Risk Level
  - Harms/discomforts in proposed research equivalent to harms/discomforts encountered by healthy children in their daily lives or experienced in routine physical or psychological examinations
  - Relate to maturity level of research subjects
  - Consider duration, magnitude and probabilities when determining level of risk
- Minor Increase over Minimal Risk Level
  - Slightly above minimal risk
  - Standard child is still a healthy child

Examples of Risk Categories

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Risk Category</th>
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<tbody>
<tr>
<td></td>
<td>Minimal Risk</td>
</tr>
<tr>
<td>Single Venipuncture</td>
<td>X</td>
</tr>
<tr>
<td>Chest XR</td>
<td></td>
</tr>
<tr>
<td>DEXA</td>
<td></td>
</tr>
<tr>
<td>LP</td>
<td></td>
</tr>
<tr>
<td>Liver biopsy</td>
<td></td>
</tr>
<tr>
<td>OGTT</td>
<td></td>
</tr>
<tr>
<td>Skin biopsy</td>
<td></td>
</tr>
<tr>
<td>Urine catheterization</td>
<td></td>
</tr>
</tbody>
</table>

Source: NHRPAC, 2002
Prism One- risk evaluation

- Additional Considerations
  - Observational versus interventional studies
  - RDBPCT versus comparison to standard of care
  - Relatively healthy, chronically, or catastrophically ill subjects
  - DSMBs

Prism Two- Respect for Autonomy

- Assent/permission is a process, not a form
- Clarify for children degree of control they will have over participation decision
- Whenever possible, obtaining assent with
  - No prospect for direct benefit- more important to have assent and willingness to participate
  - Prospect for direct benefit- still important to discuss, even when children do not want to participate
- Need for repeated assent when children reach new developmental milestones over time

Prism Two- Payments

- Agreement to participate in research should not be coerced: unduly influenced by psychological, financial, or other pressures
- Compensation ought to be discussed openly, but not emphasized during the permission/assent process in manner that unduly influences decision-making
- Compensation is good when
  - Communicates appreciation
  - Encourages participation for people that would want to participate but for (financial) hardships assuaged by the compensation
Prism Three- Justice

• Consider whether a study encourages under- or overrepresentation on the basis of social categories that are not the subject of the study
• If one is selecting patients based on a vulnerable social category, is this for a medically and scientifically important reason?
• Are there study recruitment methods or compensation strategies that can assuage unwanted under- or overrepresentation?
• International Research- beneficence and justice in action

Summary

• Twenty minute overview of research ethics is not easy
• As a vulnerable group, children garner special protections from harm and assurances of benefit
• Unique to pediatric research is the determinative nature of risk level and subject-focused benefit
  – nothing more than minimal risk unless particular pediatric subjects will benefit directly or indirectly

References

  http://www.fda.gov/ohrms/dockets/fg02/sld/1971/12711c1_04_Wilfond
  http://www.hhs.gov/ohrp/children
• Ramsey B. Appropriate Compensation of Pediatric Research Participants: Thoughts From an Institute for Medicine Committee. J Peds 2006 148:515-59
Writing and Presenting Abstract for a National meeting

“Begin with the End in Mind”

Valeria Cohran M.D., M.S.,
Medical Director of Intestinal Rehabilitation/Transplant
Children’s Memorial Hospital

OUTLINE:
• Writing an abstract
  • (tips and tricks)
  • Presenting an abstract

Let’s start writing an Abstract!

- Know the rules
  - Can not be previously presented at another meeting
  - Can not be published at time of presentation
- Know the deadlines
  - Often 5 – 6 months in advance of the meeting
  - Example: DDW (May) deadline: early December
  - NASPGHN (Oct) deadline: May
  - AASLD (Oct) deadline: May
- Know the style
  - Read the abstracts from the previous meetings
  - Pay attention to font size, formatting, and length
Style: clear and strong!

- You want your abstract to be hard-hitting!  
  - 1st person, active voice:
    - “We studied…” “We observed…”  
    - not “…It was observed that…”
- Avoid abbreviations (no more than 2)
- One idea --- one abstract
- Remember: Good science requires good writing!

Abstract: Format
(always 7 parts)

- Title
- Authors / Institution
- Introduction / Background
- Hypothesis / Aim
- Methods
- Results
- Conclusion

1. Title

- “An accurate promise of the abstract’s contents” D. J. Pierson
Most effective when it refers to its overall “take home message”
- Ideally: 10 – 12 words
  - Easy to understand
  - No abbreviations
- Avoid “cute” jokes and plays on words.
2. Authors & Institution

- Limited to the people who actually designed, did, and analyzed the study.
- Rank order of the relative contributions
  1st author (presenter, you!) → last author (mentor)
- Conflict of Interest

3. Introduction/Background

- Answers the question: “Why did you start?”
- Provides context for why you performed the study
- Assume readers/reviewers have some familiarity with subject
- Ideally: 1 – 2 sentences

4. Hypothesis/Purpose

- Answers the question: “What was your goal?”
- One definitive sentence!
- Acceptable formats:
  “We hypothesized...”
  “The aim of this study was ...”
  “The goal of this study...”
- Surprisingly, often omitted!
5. Methods

- Answers the question: “What did you do?”
- Can be written before study started
- This section most often cited by reviewers as reason for a rejection!
- Concise – details may be omitted

**Basic research:** models, techniques
**Clinical research:** subject pop. (N=) retro- or prospective, randomization, controlled
**Statistical analysis of data**

6. Results

- Answers the question: “What did you find?”
- The phrase "The findings will be presented" is unacceptable!
- Need to include real data
  - ° N= and p= values a good idea.
- Something is either significant or it is not!
  - Do not use phrases "trending towards", "almost significant", "different, but not statistically significant"
- A table or figure is ok – make sure it:
  - is not too small
  - does not duplicate text

7. Conclusion

- Concise statement of why the study's findings are important
- Reasonable and supported by the results
- Can include interpretation

- Do not:
  - make more of the data than is deserved
  - restate results

- Optional: If space allows…can include implication statement and/or future direction
References:

- Pierson, DJ. How to write an abstract that will be accepted for presentation at a national meeting. Resp Care 49:1206-1212; 2004.

Art of Oral Presentation

4 W's in Presenting

- Who?
- What?
- Where?
- When?
4 W’s in Presenting

- **Who?**
  - Know your audience
    - Scientists, medical or graduate students, nurses, physicians
  - **Adult Learning Behaviors**
    - Motivated to learn
    - Aims must be clear
    - Audience participation

4 W’s in Presenting

- **What?**
  - Research
    - Hypothesis
    - Significance/Aims
    - Methods
    - Results
    - Conclusions

4 W’s in Presenting

- **Where?**
  - National scientific meeting
  - Departmental meeting
  - Fellows’ conference
4 W’s in Presenting

- When?
  - In the morning
  - After lunch
  - During a dinner/lunch session
    - Entertaining slide/cartoon
    - Carefully worded joke

Research Presentations

- Research
  - Hypothesis
  - Significance/Aims
  - Methods
  - Results
  - Conclusions

TABLE 1. “Slide rules”

1. KISS and KILL!
2. Visual aids should be visible and should aid
3. Don’t let the medium upstage your message
4. Never show a slide for which you have to apologize
5. “Use it or lose it”—delete deadspace and irrelevant material

Principles of Presenting

• Keep it Large and Legible (KILL)
• Back of the room should be able to read your slides
  – 6-8 lines of information
• Audience reads 500 words/ minute
• Spoken word  125 words/minute
• Slides
  – Consistent
  – Not Distracting
Presentations

- Font (TNR)
- Font (TNR bold)
- Font (Arial)
- Font (Arial bold)
- Font (Arial Black bold)

Is the Font size the same?
Can it be read in the back of the room?

Text

- Concise
- Clear
- Proofread and Spell-check
- Audience reads faster than you speak!

Principles of Presenting

- Slides
  - Title each slide
  - Carefully chosen animation
  - Pointer use
  - Explain your graphs/figures
  - Transition between slides
Number of UNOS listing for ITx Oct 1987-Jan 2005

- Intestine + Liver: 1159
- Intestine only: 400

74.3% vs 25.7%

Differences in Liver Listing Status between Pediatric and Adult Intestinal Transplant

- <17 yrs, n=1106
- >18 yrs, n=453

% of LIL

- <17 yrs: 33.1%
- >18 yrs: 46.4%

Waiting List Mortality

- Light blue = Intestine only
- Dark blue = Combined liver/intestine

Presentation

- Bold Text
- Figures
- Animation
- Transitions between slides
- Practice

Conclusions

- 4 W's of Presenting
  - Who, What, When, Why
- KILL
  - Keep it Large and Legible
- Slides
  - Must be consistent,
  - Proof-read,
  - Transitions
- Practice

Acknowledgments

- Drew Feranchak, M.D.
- Nestle
- NASPGHAN
Breakfast with NASPGHAN and CDHNF

Kathleen Schwarz, MD
&
Maria E. Perez, DO

North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition

• Only society in North America and the largest in the world serving the Pediatric Gastroenterology and Nutrition communities
• More than 1400 pediatric gastroenterologists in North America

NASPGHAN Mission

• Advance understanding of normal development, physiology, and pathophysiology of diseases of the GI tract and liver in children
• Improve quality of care by fostering the dissemination of this knowledge through scientific meetings
• Professional and public education
• Policy development
• Serve as effective voices for members and the profession
Benefits of Membership

- Free participation at yearly Fellows Conferences
- Reduced registration fees for the NASPGHAN Annual Meeting, Postgraduate course, and other educational offerings
- Reduced subscription rates for JGPN
- Free NASPGHAN Quarterly Newsletter
- Free subscription to the PedsGI and PedsGI Fellows Bulletin Board
- Access to the Members-Only section of the NASPGHAN website
- Eligibility for research awards and to apply for research grants from CDHNF
- Opportunity to become a member of and participate in NASPGHAN Committees

NASPGHAN Committees

- Public Affairs & Advocacy
- Awards
- Clinical Care & Quality
- Endoscopy & Procedures
- Ethics
- Fellows
- Finance
- Hepatology
- IBD
- International
- MOC Task Force
- Neurogastroenterology & Motility
- Nominations *
- Nutrition
- Obesity Task Force
- Practitioners Task Force
- Professional Development
- Professional Education
- Public Education
- Publications
- Research
- Technology *
- Training

Committee Selection Process

- Sign-up sheets at 1st Year Fellows Conference
- Sign up for 2 committees
- Random selection process – two 1st year fellows per committee
- Those not chosen for a committee, will be given the opportunity to join the Fellows Committee
- Committee meetings held at DDW and NASPGHAN annual meetings
NASPGHAN Fellows Committee

• Open to all Fellows
• Educate new fellows about NASPGHAN
• Annual reminder regarding the ITE
• Fellows receptions at both DDW and NASPGHAN
• Responsible for committee selection process
• Education about the individual Fellows Conferences
• Maintenance of the Fellows section on the NASPGHAN website

NASPGHAN Fellows Committee

• BOARD REVIEW
  - Main focus of Fellows Committee over the past two years
  - Monthly board review questions via ListServ
  - Board Review Book
    • Approx 90 fellows (past and current)
    • Senior Editor - Judith Sondheimer (Georgetown)
    • 13 section editors
    • Will be published book, available to all NASPGHAN members
    • Funding by Nestle
  - Publisher - Castle Connolly Graduate Medical Publishing
Getting the Most Out of Your Fellowship

Vicky Lee Ng, MD, FRCPC
Division of Pediatric GI/Hepatology and Nutrition
SickKids Transplant Centre
The Hospital for Sick Children
University of Toronto
January 2011

How can you get the most out of your fellowship?

Goals of Fellowship Training

- Clinically competent in all aspects of general pediatric GI (identify 1-2 areas of clinical expertise)

- Learn about research

- Find a job

- Define and start building a career
Goals of Fellowship Training

• Begin to build skill sets and contacts necessary to:
  – Become a physician-scientist
  – Become a clinician educator
  – Become a clinical expert
  – Run your own practice
  – Become a division director/department chair/fellowship director
  – Work in industry

Requirements for Board Certification

• Clinical competence
• Comprehensive core curriculum of scholarly activities
• Areas of scholarly activity:
  – Basic, Clinical, Translational research
  – Health services research
  – Quality improvement
  – Bioethics
  – Education
  – Public policy

Clinical Competence

• Throw yourself into your clinical experiences

• See as many patients as you can during your clinical time

• Take every opportunity to do ANY procedure, especially those you’re least comfortable with
Clinical Competence

- Pay attention to how different people handle similar problems (fussy baby, adolescent with abdominal pain, asymptomatic elevated LFTs)

- Take advantage of “external knowledge” – nurses, nurse practitioners, coordinators, nutritionists, etc.

- Ask lots of questions

Clinical Competence

- Observe procedures (ERCP, Kasai, IBD surgery, manometry)

- Get as much Pathology and Radiology experience as you can

- Listen to the senior staff talk about the cases that puzzle/interest them

- Read about your patients occasionally
  - Peer-reviewed research articles
  - Review articles
  - Textbooks
  - Google (Scholar)

Choosing an Area of Scholarly Activity
Choosing a Research Project

• Take note/Awareness of basic reactions:
  – What kind of questions grab your attention?
  – At a conference – what kinds of talks excite you/put you to sleep?
  – What kind of papers do you enjoy reading?

Choosing a Research Project

• What do you like to do?
  – Imagine what you’ll be doing day-to-day to get your data

How To Choose a Good Project

• Be informed!! (or hang around people who are)
• Look for gaps in the current knowledge:
  – Data are too difficult for more senior people to bother getting
  – Lack of the right technique
  – Nobody’s gotten around to it yet
How To Choose a Good Project

- Follow “hot” journals – e-mail Table of Contents
- Talk to smart people – senior staff in your division, people you meet at conferences
- Pay attention to cool weird stuff that happens – Why??

Choosing a Mentor

Coming Up!

It’s time to get a REAL job
### NASPGHAN
Peds GI Workforce Survey 2003-04

<table>
<thead>
<tr>
<th>Employment Status</th>
<th>USA</th>
<th>Canada</th>
<th>Total</th>
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<tbody>
<tr>
<td>University/Academic</td>
<td>56%</td>
<td>87%</td>
<td>58%</td>
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<tr>
<td>Private Practice</td>
<td>23%</td>
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<td>22%</td>
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<tr>
<td>Hospital or Clinic</td>
<td>16%</td>
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<td>16%</td>
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<tr>
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<tr>
<td>HMO</td>
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<td>17%</td>
<td>3%</td>
<td>16%</td>
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</table>

| Percent who receive a portion of salary from grants | 24% | 11% |

### NASPGHAN
Peds GI Workforce Survey 2003-04

<table>
<thead>
<tr>
<th>Academic Track</th>
<th>USA</th>
<th>Canada</th>
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<tbody>
<tr>
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<td>7%</td>
<td>10%</td>
<td>7%</td>
<td></td>
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### Career Development
Finding a job

- Use national meetings as a chance to meet people
- Ask your mentor(s) to introduce you to more senior people
- Use contacts (former fellows, other 1st year fellows) to learn about opportunities
- Become involved in NASPGHAN (bulletin board, website, JPGN, committees)
Career Development

- Take time to think about your life/career
- Write down what you want
- Try to find someone to pattern yourself after
- Identify at least one senior person who will talk to you about your career, not just your research
- Share what you’re thinking - people WANT to help you!

Career Development

Basic Skills

- Learn to manage your time
  - Handle paper only once
  - Do dictations immediately
- Read, Read, Read
  - Organize and file articles
  - “Chance favors the prepared mind”
- Write as you go
- Sharpen the saw

In the end.....

- Don’t panic about the future
- Take advantage of the expertise that surrounds you
- Be indulgent – choose things that REALLY interest you
- Push yourself
- Enjoy the journey
Resources

- [http://sciencecareers.sciencemag.org/career_development](http://sciencecareers.sciencemag.org/career_development)
- [http://www.acphysci.com/aps/app](http://www.acphysci.com/aps/app)
Choosing a Mentor

NASPGHAN Fellows Conference
January 15, 2011
Peter Lee, MD
INOVA Pediatric Digestive Disease Center

What is a Mentor?

- A wise and trusted counselor or teacher

- Today, mentorship refers to a developmental relationship in which a more experienced person helps a less experienced individual to develop... in a spectrum of capacities.
Why do I need a Mentor?

- January is National Mentoring Month

I think mentors are important and I don't think anybody makes it in the world without some form of mentorship. Nobody makes it alone. Nobody has made it alone. And we are all mentors to people even when we don’t know it.

Oprah Winfrey

WhoMentoredYou.org

Qualities of a Mentor

- Knowledgeable, respected, supportive, honest, enthusiastic, encouraging
- “Academic Parent”

A good Mentor teaches, promotes, supports and advocates for their Mentee

A good Mentor is invested in their Mentee

Qualities of a Mentor

A good Mentor teaches:

- Writing skills – abstract submission, grant writing
- Oral presentation skills
- Critical Thinking
- Time management
Qualities of a Mentor

A good Mentor **promotes:**

- Is honest with you – Strengths and Weaknesses
- Guides you and provides constructive criticism
- Encourages you to strive for excellence

Qualities of a Mentor

A good Mentor **supports:**

- Makes time for you
- Listens well
- Inspires you (role model)
- Dealing with disappointment

Qualities of a Mentor

A good Mentor **advocates:**

- Career Planning and Development
- Provides opportunities
- Networking
How do I find one?

Mentor Tree

It may take more than one apple to fill all those needs.

How do I Start?

This above all: To thine own self be true
Polonius to Laertes: Hamlet Act 1, scene 3

Self Reflection: What are my needs?

Short term: Research goals, clinical training

Long Term: Professional and personal development

Where to look?

Academic/Research Path:

- Mentoring Programs
- Lead Investigator (research project), Faculty member, Post-doc fellows
- Ask your fellowship director, senior fellows, other faculty members
Where to look?

Clinical Educator/Private Practice Path:

- Recent faculty on clinical educator pathway
- Local/Private practice GI in community
- Fellowship Director, Medical School Faculty, Senior Fellows

How Do I Ask?

- Be Prepared! - Be able to outline your short and long term goals, what will it take to reach these goals and how can your mentor help you to reach these goals. 
  - Personal Mission Statement
- Set up a formal meeting/interview to discuss the possibility of mentorship
- Be enthusiastic, honest, humble

How Do I Make it Work?

- Recognizing the “Chemistry” – Does their style of teaching, communication match or clash with yours?
- Be active not passive – Don’t expect your mentor to set-up everything
- Be prepared – have an agenda, send any key information in advance
Multiple Mentors?

For Multiple Needs

“the assumption behind mentoring – ‘I’ll tether myself to one person who will take care of me’ – is bankrupt. A better way is to build...a personal mosaic of influences, experts and guides.”

“A” Good Mentor is Hard to Find

- **Research Needs** – Build and develop your critical thinking, research skills, interpretation of the medical literature
- **Personal Needs** – Balancing work and family
- **Career Planning Needs** – Teaches you how to “play the game”, politics of academic medicine, business side of medicine

Take-Home Messages

- A mentor is essential to a successful career
- Mentees need to be diligent in seeking out these relationships
- You may find/need several mentors along the way
- Maximizing the satisfaction and productivity of a successful mentor-mentee relationship requires self-awareness, focus, mutual respect, and explicit communication about the relationship.
References


How to Read & Critically Appraise Medical Literature

Wallace Crandall, MD
Nationwide Children’s Hospital

How to Read & Critically Appraise Medical Literature (without a biostatistics degree)

Wallace Crandall, MD
Nationwide Children’s Hospital
Goals

- Discuss one approach to becoming comfortable evaluating medical literature
- Identify resources to help with this process

Resources

- Users Guides to the Medical Literature
  - I. How to Get Started
    - Getting Started
      - Asking questions that are pertinent and answerable
      - Tracking down articles
    - Three Questions
      - Are the results of the study valid?
      - What are the results?
      - Will the results help me in caring for my patients?

Getting started

- Asking questions that are pertinent and answerable
  - More than just “reading”
  - Relevant to your patient
  - Tracking down articles
Getting started

- Asking questions that are pertinent and answerable
  - "What should I do for my 15 yo IBD patient with low bone mineral density?"
  - "Should I give him a bisphosphonate?"
  - "Are bisphosphonates effective for low BMD?"
  - "Are bisphosphonates safe and effective in improving low BMD in adolescents with IBD?"

Oxman AD, Sackett DL, Guyatt GH, JAMA 270(17), Nov 1993

Getting started

- Tracking down articles
  - Systematic reviews (eg Cochrane review)
  - Practice Guidelines
  - "High Impact" journals
    - NEJM     51.2
    - JAMA     31.7
    - Gastroenterology 12.5
    - Am J Gastro  6.1
    - Pediatrics  4.7
    - J Pedcs  4.1
    - JPGN  2.1

Oxman AD, Sackett DL, Guyatt GH, JAMA 270(17), Nov 1993

Three Questions
(last year it was 10)

- Are the results of the study valid?
- What are the results?
- Will the results help me in caring for my patients?
  - You still have to make a decision for your patient, regardless of the evidence
- These are often not "yes/no" answers
- Specific approach will vary by study type

Oxman AD, Sackett DL, Guyatt GH, JAMA 270(17), Nov 1993
Therapy or Prevention: Are the Results of the Study Valid?

- Do results provide an unbiased estimate of treatment effect?
  - Was the question appropriately framed?
  - Were patients randomized?
  - Were patients, study personnel ‘blinded’?
  - Were groups similar at start of trial?
  - Were groups treated equally?
  - Was the evidence appropriately collected and summarized?
  - Were all patients accounted for?
  - Was follow up complete?
  - Were patients analyzed in groups to which they were randomized?
What are the results?

- How large was the treatment effect?
  - Point estimate: The best estimate of treatment effect (not the actual treatment effect, just "in the neighborhood").
  - Absolute risk reduction, relative risk, relative risk reduction, etc
- How precise was the estimate of effect?
  - Confidence intervals: "The neighborhood" in which lies the actual treatment effect.
  - If crosses "0" or "1", can't be assured of effectiveness.
  - If positive study, examine the low end of CI to consider clinical significance.
  - If negative study, examine upper end of CI to assess for possible clinical significance. If yes, study failed to exclude an important effect.


Will the results help me in caring for my patients?

- Can the results be applied to my patient?
  - Would your patient have been eligible?
  - Is there a compelling reason why results should not be applied to my patient?
  - Beware of sub-group analysis ("dredging")
- Were all clinically important outcomes considered?
  - Be cautious of "substitute end points"
  - Balance measures
  - Are likely benefits worth the potential harm and cost?
  - NNT
  - NNH


Statistics

“He uses statistics as a drunken man uses lamp posts - for support rather than for illumination.”

Andrew Lang
Understanding What We Read

- Healthy 45 yo male undergoes a screening test for a specific cancer
  - Occurs in 1 in 1000 people of his age
  - 99% sensitive (ie only 1% false negative)
  - 98% specific (ie only 2% false positive)
- His test comes back positive
- What is the probability that he has cancer?
  - PPV 4.7%

Interpreting a Positive Clinical Trial

- You are reviewing a manuscript of a perfectly designed, well conducted, carefully evaluated study
- Results
  - Treatment A is significantly better than Treatment B, p=0.03
- What does this mean?

Assumptions:
- 10% of experimental treatments are better than standard treatment (fair estimate)
- Power of 80%
- PPV 64%
  - 1/3 of “perfect” studies with positive results are misleading

Beck-Bornholdt HP, Dubben HH. p<0.05! So what?—What we can learn from the statistician?
<table>
<thead>
<tr>
<th>Power of study (% of times</th>
<th>Percentage of &quot;significant&quot; results that are false positives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P=0.05</td>
</tr>
<tr>
<td>20</td>
<td>0.5</td>
</tr>
<tr>
<td>50</td>
<td>2.4</td>
</tr>
<tr>
<td>80</td>
<td>4.5</td>
</tr>
</tbody>
</table>

*Corresponds to observations in Table 2.
SONIC- Clinical Remission Without Corticosteroids at Week 26

Primary Endpoint

![Graph showing remission rates for different treatments.](image)


Recommendations

- Become very good at the fundamentals
  - Regular “exercise”
- Then use the excellent available resources to start filling in any “holes”
- Be thoughtful, critical, ... and realistic
Teaching Talk: Dos and Don’ts

Michael Narkewicz MD
Professor of Pediatrics
Hewit Andrews Chair in Pediatric Liver Disease
Fellowship Program Director

Goals
• Outline of Adult Learning
• Tips for a Teaching Talk
• Examples

Understand Adult Learning
• Adults:
  – have a specific purpose in mind;
  – are voluntary participants in learning;
  – require meaning and relevance;
  – require active involvement in learning;
  – need clear goals and objectives;
  – need feedback;
  – need to be reflective.
Get the Details of Your Talk

- Who is the audience:
  - Make your talk pertinent to the audience
  - Parents vs Nursing vs Medical Students vs Residents vs PCPs
- How much time do you have
  - Major complaint: Talked too long and too fast
  - 1 slide per minute of your talk
- What are the goals of asking you to talk?
  - Develop talk goals
  - Adults need clear goals

Often Helps to Have a Case
Adults Require Meaning and Relevance

- Tips
  - Collect images from interesting cases: never know when you may use them
    - I have a folder with images from cases (XRays, Endoscopy images, Path images)
  - Cases act as a hook to keep interest and shows relevance

Cover Story
Hepatitis C

PUB MED:
24,641 articles, 1645 in children
Define the Goals

- State the Goals up front:
- Maximum Three
- Pancreatitis
  - Review definitions
  - Understand the evaluation
  - Know the management options

Know your subject

- Review the literature for guidelines, reviews
- By definition, most times you will know more than the others.
Make the talk interactive

• Set up the talk to allow participation
  – What would you do next?
  – What are the top items on the differential diagnosis?
  – How many people would get X?

Some key items not to do

• I know that you can’t see this table but
• Use red and green (color blind issues)
• Put key items in a corner of a slide

Sequence data
Sequence Data

- There are 25 key mutations in ferroportin
- The amino acids involved in the mutations are similar between humans and other species including mice and xenopus
- Mutations occur at key parts of the protein in this autosomal dominant

Examples of common mutations

- 36 Mutations in Ferroportin
- 10 predicted to cause disease
  - 5 non classical
- Carrier rate is <1:150 for each
- Many mutations with unknown effect
Use arrows and highlights in the talk

Keep the focus of the slide in the center

Don’t put the key element on the side or in the corner

Use the right font for the job
Leave time for Questions

Questions?
Twelve tips on teaching the consultant teachers to teach

DAVID WALL
University of Birmingham and West Midlands Deanery, Birmingham, UK

Introduction

There has been concern at the standard of clinical teaching in hospitals in the United Kingdom for some time (Hore, 1976; Parry, 1987; Lowry, 1992). Teaching by humiliation and ritual sarcasm, and the demotivating effect this may be having on junior doctors and medical students have been described (Metcalfe & Matharu, 1995). Similar problems exist in North America, where a literature review (Irby, 1995) showed that undergraduate and postgraduate medical teaching was variable, unpredictable, lacked continuity and gave virtually no feedback. In Australia, similar problems of little feedback, poor supervision and haphazard assessment of junior doctors have also been described (Rotem et al., 1995), which were worse in large teaching hospitals.

To try to address these issues and improve teaching and the educational climate in hospitals, the Standing Committee on Postgraduate Medical and Dental Education (SCOPME) issued a report on Teaching Hospital Doctors and Dentists to Teach: Its Role in Creating a Better Learning Environment (SCOPME, 1992). Following this publication, there was an upsurge in the level of professional debate about the need to improve clinical teaching (Lowry, 1992, 1993). In a review of current medical education, Coles (1993) concluded that a change in educational and teaching methods, rather than a rearrangement of course content, was needed. He drew attention to the teaching culture, and advocated methods that reflected the aims and objectives of the curriculum, and the principles of adult learning, more small-group work, and problem-based learning. He maintained that it was imperative that teachers understand the principles of adult learning, curriculum development, evaluation and assessment.

Several initiatives for 'Training the Trainers' or perhaps the better named 'Teaching the Teachers' are already in place (Batstone, 1996). The Universities of Dundee and of Wales (in Cardiff) have had courses leading to qualifications in medical education for many years, even before the SCOPME report was published in 1992. Several Deaneries and Royal Colleges are now beginning to run courses to help consultants improve their teaching skills (Biggs et al., 1994; Peyton, 1996, 1998; and Dennick, 1998). There is an increasing interest in the need for training in teaching skills.

Some of these courses are short, one- or two-day courses for the busy consultant. The consultant is now called upon to be a good educational supervisor for the house officer (General Medical Council, 1997), to supervise and appraise the senior house officer (General Medical Council, 1998), and to assess the learning needs, appraise and assess the specialist registrar (Department of Health, 1996). Most consultants have no training in these new skills, so how may we set up, run and evaluate such courses for the average busy consultant in our hospitals?

This article contains some advice, based on educational principles, on research carried out (Wall and McAleer, 1999), and on experiences in running Teaching the Teachers courses for consultants in all specialities in the West Midlands over the last 3 years. This article offers 12 tips for those setting up and running such courses.

What shall we teach? Establishing the curriculum for your course

Educational planning based on sound principles and increasingly on research evidence will ultimately lead to more effective and efficient medical education in the future (Bligh, 1999). When planning a curriculum for a course, Harden (1986) described 10 questions to ask while carrying out this task. These were related to needs, aims and objectives, content, organization of content, educational strategies, teaching methods, assessment, communication of curriculum details, the educational climate, and progress—how to manage it. Going back to the beginning, Dunn et al. (1985) described several methods for deriving a curriculum. The best methods included the Delphi technique (with opinions from experts), critical incident studies, and behavioural event analyses with star performers in the area. However, there may be no need to derive the curriculum from scratch. Recent research has identified several key themes which both consultants and junior doctors think are very important to be taught on such courses (Wall & McAleer, 1999).

These are:

- giving feedback constructively;
- keeping up to date as a teacher;
- building a good educational climate;
- assessing the trainee;
- assessing the trainee's learning needs;
- practical teaching skills.

These will give a start. However, you may need to focus the curriculum more towards the particular speciality concerned, using perhaps a Delphi technique, or interviews with star performers in that speciality (Dunn, Hamilton and Harden, 1985). For example, urologists may place more emphasis on teaching practical skills effectively than do psychiatrists. Remember that effective needs assessment involves teachers.
learners and experienced programme planners in a constructive dialogue (Laxdal, 1974).

**Tip 1**

Establish your curriculum based on sound educational principles, and tailor this to the specific group of consultants on your course.

**Setting the learning objectives**

Stenhouse (1975), in a major work on curriculum development, stressed the importance of curriculum development resting on the translation of general statements of aims into much more specific and precise behavioural objectives. The objectives model has considerable power. Objectives have been described as the “light and heat in educational technology” (Rowntree, 1982). Outcomes of the course should be stated precisely, and the teaching planned and the educational experiences offered on the course should fit in with these outcomes (Harden et al., 1999).

Therefore the course timetable will state the aims and the objectives of the course. For example, a practical teaching-skills course may have a broad aim, and much more precise behavioural objectives for what the candidate will be able to do at the end of the course. This could be:

- **Aim**: To give candidates the opportunity to explore the knowledge and skills of a variety of teaching methods.
- **Objectives**: At the end of the course the participants will be able to:
  1. demonstrate the principles of teaching practical skills effectively;
  2. demonstrate how to give feedback constructively and effectively.
  3. and so on.

**Tip 2**

Set the learning objectives based on the curriculum in terms of what the candidates will be able to do at the end of the course. Plan the teaching on your course around these stated objectives.

**The use of active learning methods**

Coles (1993) suggested changes to the educational methods used in medical teaching and learning. He emphasized that teaching methods must reflect the aims and the objectives of the curriculum, and that they embody the principles of adult learning (Brookfield, 1986). Such methods include doctors taking more responsibility for their own learning, with more small-group work, discussions, problem-based learning, and fewer lectures and formal teaching sessions.

Teachers do need to understand the new relationship between teacher and learner, with the learners gradually assuming more control over their education themselves. Teachers are facilitators of learning, and may be helped by using small-group workshops on a course to stimulate their thoughts on effective teaching and learning (Price & Miflin, 1994; Walton, 1997).

In our own courses, we use a mixture of short, 15-minute keynote talks, small-group work with tasks, plenary sessions, role plays, and practical teaching exercises. We emphasize the principles of adult learning (Brookfield, 1986) very early on in the course as:

- voluntary participation;
- mutual respect between teacher and learner and among learners;
- collaboration between teacher and learner and among learners;
- action and reflection;
- critical reflection;
- nurturing of self-directed adults.

So, candidates on such courses are working to tasks set, to solving problems, and are actively involved in the course as a deliberate educational strategy.

**Tip 3**

Use active learning methods such as small-group work, role plays, practical exercises and problem solving, based on the aims and objectives of the course curriculum, and on the principles of adult learning.

**The educational climate**

Many studies have described a poor educational climate in our hospitals. Such problems have included poor or no feedback, poor supervision, variable and unpredictable teaching, lack of continuity, and teaching by humiliation, shouting and ritual sarcasm (SCOPME, 1992; Metcalfe & Matharu, 1995; Rotem et al., 1995; Guthrie et al., 1995). When feedback was given, it often concentrated only on what was done wrong (Dillner, 1993).

So, we aim to explain in simple terms what the educational climate is. Many consultants do recognize this, but will often use other words to describe the concept, such as ‘ambience’, ‘environment’ or ‘atmosphere’. We talk of the climate in terms of physical, emotional and intellectual attributes. Many are surprised that the educational climate can indeed be measured, using a valid and reliable tool, the Dundee Ready Educational Environment Measure or DREEM (Roff et al., 1997).

We aim to provide a good educational climate on our courses. It is important to practise what you preach, and set up the course in a pleasant setting, with good facilities (especially enough small rooms for breaking up into small groups), adequate parking and directions, good communications, good handout packs, and a friendly relaxed atmosphere. Some humour is important (Ziegler, 1998), and can make a valuable contribution to the educational process. It has been shown to reduce stress and anxiety, build confidence and reduce boredom. Remember that some consultants coming on such courses may be very apprehensive, and have not for a long time been in the learner role, or been in a small-group setting. They should, it is hoped, go home at the end having enjoyed the day and had some fun, as well as learned something!

**Tip 4**

Pay attention to the educational climate of your course. Practise what you preach, and aim for a friendly, supportive and non-threatening environment for teaching and learning. It should be fun.

**Giving feedback constructively**

This theme was top of the list of 15 educational themes rated by 441 consultants and junior doctors in the West...
Midlands, when asked what should be taught to consultants on a teaching the teachers course (Wall & McAleer, 1999). Trainees do complain of lack of feedback, of no feedback at all, or feedback given negatively, sometimes by humiliation, sarcasm, sexism and shouting (Metcalfe & Matharu, 1995; Guthrie et al., 1995; Paice et al., 1997). Feedback given constructively does improve learning (Rolfe & McPherson, 1995), and this is true in very many teaching and learning situations (Black & Wiliam, 1998). There are methods of giving feedback constructively. The well-known ‘Pendleton’s rules’ (Pendleton et al., 1984), and the ‘One Minute Teacher’ (Gordon et al., 1996) are two of these, which we use on our courses and have found to be valuable. Both depend on giving positive support and reinforcement for things that were right, and then making constructive suggestions for correcting mistakes. Very simply, the One Minute Teacher consists of five micro-skills for clinical teaching. These are:

- **Get a commitment:** What is going on?
- **Probe for supporting evidence.**
- **Teach general rules and principles.**
- **Reinforce what was right.**
- **Correct mistakes in a constructive way.** “Next time this happens why not try this instead . . . .”

We teach these early on in our courses, because we use them in the small-group work and microteaching exercises when we ask candidates to give constructive feedback to their peers on their efforts. Sometimes, individuals go straight for the criticisms, and are then asked to stop and are gently reminded to go back through the steps of Pendleton’s rules, and start again. So, as well as teaching about constructive feedback, we get candidates to give constructive feedback during the course, and have it given to them by their peers as well.

**Tip 5**

Emphasize the crucial importance of giving feedback constructively. Use models of giving feedback to help the candidates do this on the course, when giving and receiving feedback to and from each other on activities they all do on the course.

**Teaching of practical skills**

Junior doctors value this skill in their teachers very highly, much more so than do their consultant teachers themselves (Wall & McAleer, 1999). A simple model of teaching practical skills is the one used by the Royal College of Surgeons of England on their ‘Training the Trainers’ courses (Peyton, 1996, 1998). The basic elements are the preparation (set), the procedure itself (dialogue), and the summary (closure). In teaching the skill in the dialogue, a four-step model is used:

- The teacher does the procedure at normal speed.
- The teacher does the procedure again, and talks through it, performing and explaining each step.
- The teacher does it again, with the learner talking through it and explaining the steps.
- The learner now does the procedure, and talks it through as well, explaining the steps.

It is very important to give feedback constructively, using the ideas described in Tip 5 above. Leave time for ques-

- **Corrections:**
- **Teach general rules and principles.**
- **Reinforce what was right.**
- **Correct mistakes in a constructive way.**

**Role play and appraisal practice**

An ancient Chinese proverb gives the following educational advice:

- **I hear and I forget**
- **I see and I remember**
- **I do and I understand**

When teaching and learning about appraisal and how to carry out an appraisal with a trainee, we have found that a combination of a keynote talk, a video demonstrating the techniques, and some role-play appraisal practice works well. It is necessary to explain the definition and the principles of good appraisal practice (SCOPME, 1996), its purposes, and how to use appraisal to deal with problems. The Video Arts videotape entitled ‘The Dreaded Appraisal’ is an excellent illustration of both how not to do it, and then how to do it correctly. It lasts 30 minutes, makes only a few key points, does this very well, and is entertaining to watch. Finally we ask candidates to play either an appraiser or an appraisee, in a small-group setting. Case scenarios have been prepared beforehand by the organizers to illustrate particular points (Skelton & Hammond, 1998) and problems that may be encountered with trainees. They are based on real-life situations that we have experienced in the past, suitably anonymized. Some scenarios are applicable to any speciality, such as the trainee who is very polite to the consultant, but rude, aggressive and awful to everyone else. Others do need to be speciality specific, so it pays to enlist the help of colleagues in that speciality in writing and adapting case scenarios when planning the course.

How are the role play sessions structured? Case scenarios...
are given out, and candidates divided into groups of three (trios). In turn, each is asked to be an appraiser, an appraisee and an observer. Feedback is given using Pendleton's rules again (Pendleton et al., 1984). Facilitators watch these sessions, to help candidates understand the tasks and roles to be played. It does become very realistic. In a one-hour session, each of the three candidates will have a turn at being a consultant appraiser, a trainee being appraised and an observer, and have done three of the case scenarios. This is real active learning, and is usually a lot of fun.

Tip 7
Prepare case scenarios carefully, making sure they are relevant to the candidates' own experiences. Explain the purposes of the session carefully including the giving of feedback to each other using a method of giving feedback constructively (such as Pendleton's rules).

Evidence-based education
Sometimes candidates ask for evidence from the educational literature to support a concept or statement made on the course. It is useful therefore to provide a reading list of key articles and books that interested candidates may look at afterwards, and some key references to support what you are going to say on the course. Such key references are included in the handout pack given out at the beginning of the course.

We welcome the movement towards evidence-based medical education, including the new series in Medical Teacher in 1999 entitled 'Best Evidence Medical Education' (Harden, 1998) Much evidence is currently spread widely over medical education journals, specialist and general medical journals, and specialist and general education journals. This makes it very difficult to pull together good evidence to inform best practice. It will be of great benefit to have such evidence available to us.

However, there is good evidence already for some of what is being done. For example, Rolfe & McPherson (1995) discussed giving feedback constructively, with the benefits of improved learning outcomes, a deeper approach to learning, active pursuit of knowledge and improved competence at least in the short term. Further evidence in the same area came from a large review of the educational literature (Black & Wiliam, 1998), with 250 references looking at many controlled studies. This review did confirm that giving feedback constructively did work, and gave substantive learning gains.

Also, there is evidence that the 'student centred' curriculum does have benefits compared with the 'traditional' curriculum. Studies show no differences in marks for students on the new curriculum, despite widespread differences in curriculum design (Ripkey et al., 1998). However, the 'traditional' students do suffer disadvantages, with such students showing poorer moral reasoning skills, less desirable modes of learning, and increased stress (Bligh, 1999).

So we do need to be familiar with the educational literature, base our ideas on best educational evidence, and be able to suggest further reading to candidates in such areas.

Tip 8
Base your course curriculum on best evidence medical education. Have your evidence ready for the topics that will be taught on the course. Ideally put these references in the handout packs, and then they are there ready for you to refer to during the course.

Educational concepts, maps and models
A criticism of educationists, especially by clinical colleagues, is the supposed use of jargon (Harden, 1998). While this may be the case, clinical medicine is not without its own considerable amounts of jargon, which is unintelligible to others, even doctors in other specialities in medicine!

We aim to present concepts, maps and models which are as simple as possible, and try to relate these to everyday situations in medical practice. For example, the educational cycle may be simplified to four key steps and six key words as below:

- assess needs;
- set objectives;
- methods;
- assessments.

Much of what we have done is based on this simple model, as is this paper. Again, the principles of adult learning may be simplified to a few statements (see above), and the same may be done for models of giving feedback, and for teaching a practical skill, as has already been described.

As well as knowing what the model is, we design small-group activities where candidates do actually use the models in these activities on the course. This does reinforce the concepts we are trying to bring to their attention. Thus we do use structured feedback using Pendleton's rules, and we do use practical skills teaching using the model already described and so on.

We explain simply what assessment, appraisal and evaluation mean. For those who seem to use the terms interchangeably, sometimes within the same sentence, we point out that while bilirubin and alkaline phosphatase are both liver function tests, they are not the same. They cannot be interchanged, if we want others to understand what we are talking about. We explain what aims and objectives are, and illustrate this by looking at a simple First Aid Course. It is then very clear that the objectives are 'what the candidate may be expected to do at the end of the course'.

Tip 9
Keep concepts, maps and models as simple as possible. Illustrate your maps and models with examples that your course participants can follow easily, often from clinical situations.

Evaluations
Evaluation of these courses, by the course participants, the teachers themselves and by the providing organization which pays for the courses, is an important part of the curriculum (Harden, 1986).

We give a simple definition of evaluation as 'measuring the teaching' and stress that it is definitely not another word for 'assessment' of the learners. Evaluations may be by the
learners themselves, by the teachers on the course, by peers (including external bodies such as the Royal Colleges and the General Medical Council), and by oneself as self-evaluation and reflection.

We have used a simple one-page A4 size evaluation form with ideas and questions chosen from an evaluation design pack (Grant et al., 1993), and from a guide to good assessment practice (Jolly & Grant, 1997). This fits in with the ‘keep it simple’ philosophy on these courses. In addition, space is provided for free comments. This has given us much valuable information and feedback, and has enabled us to improve courses as a result of these ideas. For example, the videotape ‘The Dreaded Appraisal’ was one such idea that came from a free comment on one of the evaluation forms.

In addition, even though most people have enjoyed the course and found it useful, we still need to know if these ideas are taken back and put into practice. A longer term follow-up evaluation is very useful here. We have been able to demonstrate in the West Midlands that consultants did take these ideas on board, and after 6–12 months after the course, had put them into practice in their day-to-day teaching (Whitehouse, 1997).

All this does take time and effort. Nevertheless it is an important part of the educational strategy of improving consultants’ teaching knowledge and skills. There is a need for more research in this area to be certain that there is a change occurring as a result of the efforts put in.

**Tip 10**

Evaluation is an important part of your course.

Keep the evaluation simple, anonymous and easy to fill in. Have some space for free comments on the form. In addition, do some longer term follow up to see if ideas have been taken on board and changes to educational practice made.

**Where next? How to keep the momentum going**

Much to our delight, many consultants have become completely enthused by and very keen on learning more about medical education. For some, this seems to be similar to the ‘conversions’ described in the social anthropology literature (Coffey & Atkinson, 1996).

What can be done to maintain enthusiasm once it has been generated in the first place? Maybe the consultant trainers’ group is one way to do this. Whitehouse (1997) described that after an intensive educational course, a group of Warwickshire consultant trainers continued to meet regularly and discuss educational initiatives they have tried, and derive great benefit from peer support in such a group. Rayner et al. (1997) described a similar group of consultants at Birmingham Heartlands Hospital, who continue to meet after a series of educational courses run by the Staff Development Unit of the University of Birmingham.

General practitioners will recognize these initiatives as ‘trainers’ workshops’, where trainers meet to discuss ideas, share problems and successes, and derive peer support for their role as a teacher from the group.

In addition, many have enrolled for university qualifications in medical education. For many years the universities of Dundee and of Wales (in Cardiff) have run such courses (Batstone, 1996), and have trained many medical educators. Their knowledge and skills of medical education are now increasingly valued (Bligh, 1999). The postgraduate deans do need to support these initiatives if funds will allow, and nurture such individuals as extremely valuable educational resources.

These areas do need further research. What does enthuse such individuals? Why do they seem to come from some specialties and not others? Why do the ear, nose and throat (ENT) surgeons, the paediatricians and the obstetricians lead the field (in the West Midlands at least) in the numbers studying for educational qualifications in medical education?

**Tip 11**

Have a strategy to keep the momentum going.

Capture the enthusiasm of those who develop an interest in medical education, as they are one of our most valuable resources for the future.

**Research and development**

There remains much work to do in this area of medical education. Researchers are now shedding much welcome new light on many of the ‘traditional’ educational practices. New techniques and new ideas are being introduced to everyday medical teaching in our hospitals, with evidence to support such initiatives (Bligh, 1999).

As well as the curriculum content and objectives, the culture and values (the educational climate) of the institution are also very important. Research has shown that student choice of a career in general practice, for example, is influenced by the culture of the medical school concerned being supportive towards general practice (Lambert et al., 1996). These factors are important and do need researching.

There are still unanswered questions about the pre-registration year reforms (General Medical Council, 1997), the changes to specialist registrar training (Department of Health, 1996), and the very recently published recommendations for the senior house officer years, The Early Years (General Medical Council, 1998). Some evaluation work is already going on here, but such research does need to continue, to expand and to be funded adequately.

**Tip 12**

Research and development is an integral part of new developments and the new techniques in medical education. Research should be seen as an essential part of the overall education strategy of the teaching-the-consultant-teachers movement, and supported financially.

**Notes on contributor**

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**References**


AMEE GUIDE

AMEE Guide no. 34: Teaching in the clinical environment

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Abstract

Teaching in the clinical environment is a demanding, complex and often frustrating task, a task many clinicians assume without adequate preparation or orientation. Twelve roles have previously been described for medical teachers, grouped into six major tasks: (1) the information provider; (2) the role model; (3) the facilitator; (4) the assessor; (5) the curriculum and course planner; and (6) the resource material creator (Harden & Crosby 2000).

It is clear that many of these roles require a teacher to be more than a medical expert. In a pure educational setting, teachers may have limited roles, but the clinical teacher often plays many roles simultaneously, switching from one role to another during the same encounter. The large majority of clinical teachers around the world have received rigorous training in medical knowledge and skills but little to none in teaching. As physicians become ever busier in their own clinical practice, being effective teachers becomes more challenging in the context of expanding clinical responsibilities and shrinking time for teaching (Prideaux et al. 2000). Clinicians on the frontline are often unaware of educational mandates from licensing and accreditation bodies as well as medical schools and postgraduate training programmes and this has major implications for staff training. Institutions need to provide necessary orientation and training for their clinical teachers. This Guide looks at the many challenges for teachers in the clinical environment, application of relevant educational theories to the clinical context and practical teaching tips for clinical teachers. This guide will concentrate on the hospital setting as teaching within the community is the subject of another AMEE guide.

Introduction

Teaching in the clinical environment is defined as teaching and learning focused on, and usually directly involving, patients and their problems (Spencer 2003). The clinical environment consists of inpatient, hospital outpatient and community settings, each with their own distinct challenges. It is in this environment that students learn what it means to be a real doctor. Skills such as history taking, physical examination, patient communication and professionalism are best learned in the clinical setting, medical knowledge is directly applied to patient care, trainees begin to be motivated by relevance and self-directed learning takes on a new meaning (Spencer 2003). Teaching in the clinical setting often takes place in the course of routine clinical care where discussion and decision-making take place in real time. Often the teaching will centre on an analysis of actual patient care that the student has undertaken. This is the most common pattern for postgraduate trainees. Undergraduate students benefit from additional sessions specifically planned for teaching. These sessions may take place in the ordinary clinical environment and make use of the patients who are opportunistically available. They may on the other hand be highly structured with particular patients brought up especially for the session.

The word ‘doctor’ is derived from the Latin docere, which means ‘to teach’ (Shapiro 2001). Clinical teachers have a dual role in medicine, to provide patient care and to teach (Prideaux et al. 2000; Irby & Bowen 2004). Though all doctors are usually well prepared for their clinical roles, few are trained for their teaching roles (Steinert 2005). Clinical teachers take their role as teachers of future generations of doctors seriously and with enthusiasm. Yet, most lack knowledge of educational principles and teaching strategies thus may be inadequately prepared for this additional professional role (Wilkerson & Irby 1998). It has simply been assumed that professionals who have graduated from medical schools/colleges and undergone postgraduate training can automatically start teaching the day after they graduate. Due to advances in education such as new methods of teaching and learning, a more student-centred teaching, competency based assessment and emphasis on professionalism; educators today are required to have an expanded toolkit of teaching skills and clinical expertise (Harden & Crosby 2000; Searle et al. 2006).
Practice points

- Clinicians do not become teachers by virtue of their medical expertise, but a reflective approach to teaching and professional development can foster excellence in clinical teaching.
- By using an outcome based approach to teaching and learning, clinical faculty can progress along the spectrum of clinical teaching and if they choose to, they can become truly professional teachers.
- Soliciting feedback on teaching and reflective practice are key to advancing to the highest level of teaching and moving from being a technically sound teacher to a professional and scholarly teacher.
- Staff development can provide clinicians with new knowledge and skills about teaching and learning. It can also reinforce or alter attitudes or beliefs about education.
- Staff development can provide a conceptual framework for teaching and help clinical teachers adopt and adapt specific teaching behaviours to real clinical settings and introduce clinicians to a community of medical educators interested in furthering clinical teaching and learning.
- Several models of teaching have been described in this guide, they are behaviour based and can be easily adapted to a 5-minute teaching encounter or a one-hour encounter. These models could also help teachers set defined objectives for each clinical teaching encounter and also tailor objectives to individual learners.
- Clinical teachers should attempt to draw a road map of their career as educators, what their ultimate goals are (become technically proficient as teachers or researchers and scholars or develop into educational leaders) and how they intend to progress and accomplish their goals.

Clinical teaching overview

What makes a clinical teacher excellent?

Many investigators have examined the qualities that learners value in their clinical teachers. Irby & Papadakis (2001) summarized these and list the skills that make a clinical teacher stand out (see Box 1).

Problems with clinical teaching

John Spencer has listed common problems with clinical teaching in his article on learning and teaching in the clinical environment published in the British Medical Journal’s ABC of learning and teaching in medicine series (Spencer 2003). The following are examples of such challenges, though by no means a complete list:

- lack of clear objectives and expectations;
- teaching pitched at the wrong level;
- focus on recall of facts rather than problem solving;
- lack of active participation by learners;
- lack of congruence with the rest of the curriculum.

Box 1. Skills that make a clinical teacher excellent

Excellent clinical teachers:

- share a passion for teaching;
- are clear, organized, accessible, supportive and compassionate;
- are able to establish rapport; provide direction and feedback; exhibit integrity and respect for others;
- demonstrate clinical competence;
- utilise planning and orienting strategies;
- possess a broad repertoire of teaching methods and scripts;
- engage in self-evaluation and reflection;
- draw upon multiple forms of knowledge, they target their teaching to the learners’ level of knowledge.

Box 2. Challenges of clinical teaching

- inadequate direct observation of learners and feedback;
- insufficient time for reflection and discussion;
- lack of congruence with the rest of the curriculum.

Challenges for teachers in the clinical environment

Teaching in the clinical environment comes with its own set of unique challenges (Spencer 2003); some key ones are listed in Box 2.

Despite the numerous challenges noted, many clinicians find practical solutions to overcome them and excel in their dual role as clinician and teacher. The remainder of this guide focuses on practical educational strategies that clinicians can use while teaching in the clinical environment from technical skills to a scientific and professional approach to their teaching.

General teaching models for teaching in any clinical setting

Two models of clinical teaching have been successfully used in faculty development of clinical teachers. Both models are behaviour based and can be adapted by clinical teachers to all clinical settings. The first is the Stanford Faculty Development model for clinical teaching and the second is the Microskills of teaching model, also known as the one-minute preceptor.

S. Ramani & S. Leinster
Stanford faculty development model for clinical teaching

A popular model for teaching improvement has been the seven-category framework of analysis developed by the Stanford Faculty Development Centre. This comprehensive framework is outlined in the article by Skeff (1988). In addition, this seven-category framework has been validated by work at the University of Indiana which resulted in a 26 item questionnaire that can be used to evaluate teaching (Litzeleman et al. 1998). Although it provides a categorical framework for evaluation and analysis of teaching, the power of the model is most effectively demonstrated in hands-on seminars in which faculty are enabled to both understand and apply this method of analysis to their teaching. This model described all clinical teaching as fitting into seven key categories, lists key components under each category and further describes specific teaching behaviours under each key component.

The categories are as follows.

(1) Promoting a positive learning climate: The learning climate is defined as the tone or atmosphere of the teaching setting including whether it is stimulating, and whether learners can comfortably identify and address their limitations. It sets the stage for effective teaching and learning.

(2) Control of session: This refers to the manner in which the teaching interaction is focused and paced, as influenced by the teacher's leadership style. It reflects the group dynamics, which affect the efficiency and focus of each teaching interaction.

(3) Communication of goals: This includes establishment as well as explicit expression of teachers' and learners' expectations for the learners. Setting goals provides a structure for the teaching process, guides teachers in planning the teaching and provide a basis for assessment.

(4) Promoting understanding and retention: Understanding is the ability to correctly analyse, synthesise and apply whereas retention is the process of remembering facts or concepts. This category deals with approaches teachers can use to explain content being taught and have learner meaningfully interact with the content, enabling them to understand and retain it.

(5) Evaluation: It is the process by which the teacher assesses the learner’s knowledge, skills and attitudes, based on educational goals previously established. It allows the teacher to know where the learner is and helps them plan future teaching as well as assess effectiveness of teaching. Evaluation can be formative to assess ongoing learner’s progress towards educational goals or summative for final assessment to judge learner’s achievement of goals.

(6) Feedback: Feedback is the process by which the teacher provides learners with information about their performance for potential improvement. It provides an educational loop through which the teacher can guide learners to use the evaluation of their performance to reassess attainment of goals.

(7) Promoting self-directed learning: Teachers achieve this by facilitating learning initiated by learner’s needs, goals and interests. It stresses the importance of acquiring skills to equip the learner to continue learning beyond the time of formal education.

The one-minute preceptor

The ‘Microskills’ of teaching, also called the one minute preceptor because of the short time available for teaching in the clinical environment, provides a simple framework for daily teaching during patient care (Neher et al. 1992). It is most relevant to teaching postgraduate trainees but the steps also apply to the longer encounters that are specifically focused on teaching for undergraduates. These steps can be used to structure effective short clinical teaching encounters that last five minutes or less as well as to address problems that arise. The original microskills model uses a five-step approach.

Step 1. Getting a commitment: The teacher encourages learners to articulate their opinions on the differential diagnosis and management rather than giving their own conclusions and plans. The teacher must create a safe learning environment so that learners feel safe enough to risk a commitment – even if it is wrong.

Step 2. Probing for supporting evidence: The teacher should encourage learners to ‘think out loud’ and give their rationale for the commitment they have just made to diagnosis, treatment, or other aspects of the patient’s problem. Teachers should either validate learners’ commitments or reject them gently if flawed.

Step 3. Teaching general rules: Teachers can guide learners to understand how the learning from one patient can be applied to other situations. The learner is primed for new information they can apply to a given patient as well as future patients. If the learner has performed well and the teacher has nothing to add, this microskill can be skipped.

Step 4. Reinforcing what was done well: It is appropriate to use this microskill every time the trainee has handled a patient care situation well. Effective reinforcement should be specific and behaviour based and not vague. Positive feedback also builds the trainee’s self-esteem.

Step 5. Correcting mistakes: Negative or constructive feedback is often avoided by clinical teachers, but this is vital to ensure good patient care. Encouraging self-assessment is a good way to have the learners realise their mistakes themselves and if they have identified their errors, they can be given positive feedback on their self-reflective capabilities. If the teacher has to point out mistakes, this must be specific, timely and based entirely behaviour based.

Applying the Dundee outcomes model in clinical teaching

It has been stated that the medical profession needs to think more seriously about training their teachers and a framework for developing excellence as a clinical educator is needed (Hesketh et al. 2001). Harden et al. (1999) had previously...
proposed a 3-circle learning outcomes model to classify skills and abilities that doctors must possess. The Dundee outcomes model offers a user-friendly approach to communicate learning outcomes and was adapted to describe outcomes for medical teachers (Hesketh et al. 2001). We use this model in describing outcomes expected of a clinical teacher, moving from technical competencies to meta-competencies within each circle (Figure 1).

(1) The inner circle refers to the fundamental tasks that clinical teachers should be able to perform competently; doing the right thing.

(2) The middle circle represents the teacher’s approach to clinical teaching with understanding and application of relevant learning theories; doing the thing right.

(3) The outer circle represents the development of the individual through a professional approach to teaching in the clinical environment; the right person doing it.

In applying the three-circle outcomes model for teachers in the clinical environment we have attempted to keep these outcomes clear and unambiguous, specific, manageable and defined at an appropriate level of generality (Harden et al. 1999) (see Box 3).

**Circle one: what the clinical teacher should be able to do (doing the right thing)**

We list the following tasks as essential for teachers in the clinical environment: time efficient teaching, inpatient teaching, outpatient teaching, bedside teaching, assessment of learners in the work setting and giving feedback.

**Time efficient teaching**

Irby & Bowen (2004) described a 3-step approach for time efficient teaching in the clinical environment. All three steps described can be adapted equally well to a one-hour session as a 10-minute teaching session.

**Planning.** Advanced planning can achieve the following:
- sharpen expectations;
- clarify roles and responsibilities;
- allocate time for instruction and feedback;
- focus learners on important priorities and tasks.

The planning stage includes communicating expectations to learners, soliciting learners’ goals, creating a safe and respectful learning environment, selecting appropriate patients for the teaching and priming learners about the goals of the session.

**Teaching.** Distinguished clinical teachers draw upon a repertoire of teaching strategies to meet the needs of their learners and selectively use any or all of the following five common teaching methods.
- Teaching from clinical cases; combining simple discussions for novice learners with higher level discussions for more senior learners

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**Box 3. Applying the three-circle outcomes model for teachers in the clinical environment**

<table>
<thead>
<tr>
<th>Tasks of a clinical teacher (Doing the right thing)</th>
<th>Approach to teaching (Doing the thing right)</th>
<th>Teacher as a professional (The right person doing it)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time efficient teaching</td>
<td>Showing enthusiasm for teaching and towards learners</td>
<td>Soliciting feedback on teaching</td>
</tr>
<tr>
<td>Inpatient teaching</td>
<td>Understanding learning principles relevant to clinical teaching</td>
<td>Self-reflection on teaching strengths and weaknesses</td>
</tr>
<tr>
<td>Outpatient teaching</td>
<td>Using appropriate teaching strategies for different levels of learners</td>
<td>Seeking professional development in teaching</td>
</tr>
<tr>
<td>Teaching at the bedside</td>
<td>Knowing and applying principles of effective feedback</td>
<td>Mentoring and seeking mentoring</td>
</tr>
<tr>
<td>Work based assessment of learners in clinical settings</td>
<td>Modelling good, professional behaviour including evidence based patient care</td>
<td>Engaging in educational scholarship</td>
</tr>
<tr>
<td>Providing feedback</td>
<td>Grasping the unexpected teaching moment</td>
<td></td>
</tr>
</tbody>
</table>

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Figure 1. The Dundee 3-circle outcomes model.

Adapted from Harden et al. 1999

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Using questions to diagnose not only learners’ capacity for recall but also their analysis, synthesis and application capabilities

Using advanced learners to participate in the teaching

Using illness and teaching scripts. Examples of illness scripts include knowledge of typical symptoms and physical findings, predisposing factors that place the patient at risk and underlying pathophysiology. Teaching scripts commonly include: key points with illustrations, appreciation of common errors of learners and effective ways of creating frameworks for beginners to build their own ‘illness scripts’.

Acting as role-models at the bedside or in examination rooms

Evaluating and reflecting. Observing learners directly is an important prerequisite for effective feedback. Feedback should be based on observed behaviours, include positive and negative feedback and teachers need to promote self-assessment by learners. These techniques are discussed in greater depth later.

Inpatient teaching

Ende (1997) wrote that the role of the inpatient teacher is one of the most challenging in medical education, that of a master, mentor, supervisor, facilitator, or all of the above. Inpatient teaching can be chaotic and frustrating, as students of varying levels of sophistication and interest fight off (or surrender to) interruptions and urges to sleep, while the attending physician holds forth on unanticipated topics, and about patients who may not be available. Despite the various challenges (see Box 4), he states that inpatient teaching can be riveting if the teachers follow some basic principles. Teachers should try to facilitate knowledge acquisition by asking questions that make learners think and reason rather than recall facts. More importantly, knowledge should be applied to specific patients for clinical problem solving. Teachers should have some knowledge of different learning styles and adapt their teaching style to different learners. Teachers can set a comfortable and safe learning environment in which they and the learners freely ask questions and are prepared to admit their limitations.

Inpatient teams also need to behave as a teaching community where each member respects the other in order to maximize their learning. Teachers should learn to challenge their learners without humiliating them and provide support so that learning can be furthered. Ende suggests that in preparation for effective ward teaching, the teachers should ask themselves a set of questions before each teaching encounter.

1. What do you hope to accomplish?
2. What is your point of view?
3. How will your learners be engaged?
4. How will you meet the needs of each learner?
5. How will rounds be organized?
6. Are your rounds successful?
7. How will you make the time?

Although these questions can be applied to any clinical environment, they are particularly apt for the inpatient setting where a little mental preparation goes a long way. Time constraints, varying learner levels, unexpected teaching moments, presence or absence of the patient can all be factored in while the teacher attempts to answer these questions.

Outpatient teaching

Clinical teaching has recently been moving from the wards to clinics. In recent years, the outpatient clinics have become an integral venue to teach clinical medicine. With shorter hospital stays, it has become impossible for trainees to follow and learn the natural history of a disease from the inpatient environment. Outpatient settings provide one area where trainees can learn this, follow the patient over time and become involved in the psychosocial aspects of patient care (McGee & Irby 1997; Prideaux et al. 2000). Outpatient clinics are exceedingly busy and chaotic settings with very short teacher-trainee interactions (see Box 5). Often, clinical teachers are providing direct

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**Box 4. Challenges of inpatient teaching**

1. Difficult to set teaching goals. Unanticipated events occur frequently
2. Ward team usually composed of varying levels of learners
3. Patients too sick or unwilling to participate in the teaching encounter
4. Patient stays are too short to follow natural history of disease
5. Teachers could compromise trainee-patient relationship if they dominate the encounter
6. Trainees and teachers feel insecure about admitting errors in front of the patient and the rest of the medical team
7. Tendency by many clinical teachers to lecture rather than practice interactive teaching
8. Engaging all learners simultaneously can be difficult
9. Teachers need to pay close attention to learner fatigue, boredom and workload

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**Box 5. Challenges of outpatient teaching**

- Busy clinical setting
- Teaching time often short, no time for elaborate teaching
- No control over distribution and organization of time
- Attending to several patients at the same time with multiple learners
- Brief teacher-trainee interactions
- Patient care demands usually take priority and must be addressed
- Multiple patient problems must be addressed simultaneously, so teachers cannot focus on one problem to teach
- Learning and service take place concurrently
- Organic and psychosocial problems are intertwined
- Diagnostic questions often settled by follow up of empiric treatment
- Teacher should be a guide and facilitator rather than information provider
patient care while supervising and trying to teach students and residents (Neher et al. 1992; McGee & Irby 1997). In a busy clinic, patients too may not be interested in being participants of a trainee-teaching encounter. Overall, service requirements outweigh teaching requirements thus making this an uncontrolled teaching setting. Techniques originally described for effective inpatient teaching do not apply well to outpatient teaching. The outpatient clinic promises many unique educational opportunities including more complete observation of chronic diseases, closer relationships between teachers and learners, and a more appropriate forum for teaching preventive medicine, medical interviewing, and psychosocial aspects of disease (McGee & Irby 1997).

McGee and Irby describe practical tips for efficient teaching in the outpatient settings and they categorize these steps as follows.

(1) Prepare for the visit: Orientate learners of the number of patients to be seen, time to be spent with each patient and how to present patients succinctly.

(2) Teach during the visit: Ask questions to diagnose the learner’s knowledge and clinical reasoning, select a specific teaching point in each case, model good physician-patient interactions, observe at least in part learner-patient interactions and provide timely and specific feedback.

(3) Teach after the visit: Answer questions that arise from specific patient problems, clarify what learners did not understand, refer to literature and create reading assignments.

(4) Probe the preceptor by asking questions about uncertainties, difficulties, or alternative approaches.

(5) Plan management for the patient’s medical issues. The learner initiates a discussion of patient management with the preceptor and must attempt either a brief management plan or suggest specific interventions. This step asks for a commitment from the learner, but encourages him or her to access the preceptor readily as a rich resource of knowledge and experience.

(6) Select a case-related issue for self-directed learning. The learner may identify a learning issue at the end of the patient presentation or after seeing the patient with the preceptor. The learner should check with the preceptor to focus the reading and frame relevant questions.

Teaching at the bedside

It has been stated that since clinical practice involves the diagnosis and management of problems in patients, teaching of clinical medicine should be carried out on real patients with real problems (Nair et al. 1997). There are many skills that cannot be taught in a classroom, particularly the humanistic aspects of medicine (Nair et al. 1997; Ramani 2003) and require the presence of a patient, real or simulated. The patient’s bedside, however, appears to be one of the most challenging settings for clinical teachers. Although many clinical teachers find this an intimidating mode of teaching that bares their own deficiencies, they need to realize that all of them possess a wide range of clinical skills that they can teach their junior and far less experienced trainees (Ramani et al. 2003). Some common sense strategies combined with faculty development programmes at individual institutions can overcome some of this insecurity and promote bedside rounds, which can be educational and fun for teachers and learners alike. Teachers’ insecurities can be classified into 2 major domains (Kroenke 2001):

- Clinical domain: Teachers may feel insecure about their knowledge being up to date.
- Teaching domain: Teachers often feel intimidated by having to teach a heterogeneous group of learners who are busy and frequently sleep deprived.

Twelve practical tips have been described to help ease teacher discomfort at the bedside and promote effective bedside teaching (Ramani 2003).

(1) Preparation: Teachers need to familiarise themselves with the clinical curriculum, attempt to diagnose different learner levels and improve their own clinical skills.
Planning: Ende (1997) suggests that all clinical teachers should ask themselves the following questions prior to a teaching encounter and try to answer them:

a. What do you hope to accomplish?
b. What is your point of view?
c. How will your learners be engaged?
d. How will you meet the needs of each learner?
e. How will rounds be organized?
f. Are your rounds successful?
g. How will you make the time?

Orientation: Teachers should obtain objectives of learners, assign roles to each of the team members, try to engage everyone and establish team ground rules.

Introduction: The team of doctors need to be introduced to patients and patients should be oriented about the nature of the bedside encounter; e.g. Patients need to be told that the encounter is primarily intended for teaching and that certain theoretical discussions may not be applicable to their illness.

Interaction: The clinical teachers should serve as role-models during their physician-patient interactions and teach professionalism and a humanistic bedside manner. In addition, teachers should model team work and promote positive team interactions including professional interactions with nursing and other ancillary staff.

Observation: Teachers need not put on a show at the bedside and dominate the bedside encounter (Kroenke 2001). Observing the trainees’ interaction with the patient at the bedside can be very illuminating and these observations can be used to plan future teaching rounds.

Instruction: Clinical teachers should avoid asking the trainees impossible questions and ‘read my mind’ types of questions (LaCombe 1997; Kroenke 2001) and actively discourage one-upmanship among learners. Admitting one’s own lack of knowledge might allow trainees to admit their limitations and ask questions. Teachers can role model their willingness to learn by being prepared to learn from trainees.

Summarise: Learners would find it beneficial if teachers summarize what was taught during that encounter. Patients also need a summary of the discussion, what applies and what does not apply to their illness and management.

Debriefing: Time is needed for learners to ask questions and teachers to make clarifications and assign further readings.

Feedback: Teachers can find out from learners what went well and what did not and give positive and constructive feedback to learners.

Reflection: Reflections about the bedside encounter coupled with learner feedback can help teachers plan the next encounter.

Preparation for the next encounter should begin with insights from the reflection phase.

Work based assessment of learners in the clinical environment

Assessment plays a major role in the process of medical education, in the lives of medical students, and in society by certifying competent physicians who can take care of the public. Society has the right to know that physicians who graduate from medical school and subsequent residency-training programmes are competent and can practise their profession in a compassionate and skilful manner (Shumway & Harden 2003). Miller (1990) proposed his now famous pyramid for assessment of learners’ clinical competence (Figure 2). At the lowest level of the pyramid is knowledge

![Miller’s pyramid of assessment](image)

**Figure 2.** Miller’s pyramid of assessment.
(knows), followed by competence (knows how), performance (shows how), and action (does) The clinical environment is the only venue where the highest level of the pyramid can be regularly assessed.

Studies have indicated that performance in high stakes examinations do not accurately reflect what doctors do in actual patient care (Ram et al. 1999; Rethans et al. 2002). Patient outcomes are the best measures of quality to assess learners in the clinical settings (Norcini 2003), but these are often difficult to ascertain due to factors such as case mix, case complexity, nature of the clinical team and other intangible factors. Assessment in the workplace is quite challenging as patient care takes top priority and teachers have to observe firsthand what the learners do in their interaction with patients and yet be vigilant that patient care is of the highest quality.

Performance outcomes. Norcini (2003) states that the principal measures of performance in the clinical environment include patient outcomes, process of care and volume of services doctors provide.

- Patient care outcomes include morbidity and mortality, physiological outcomes such as blood pressure or diabetes control, clinical events such as stroke or heart attack and last but not least patient satisfaction and experience with care.
- Process of care includes such factors as patient screening, preventive services provided, disease specific measures such as HbA1C for diabetes, aspirin prescription after a heart attack etc.
- Patient volume refers to features such as number of hip replacements performed by orthopaedic surgeons or cardiac catheterizations performed by cardiologists. Volume, in general, correlates with skill and patient morbidity and mortality, but does not always equal high quality patient care.

Clinical teachers should gain familiarity with an outcomes based assessment method appropriate to their own environment (CANNED, AGCME, LCME etc.).

Rethans et al. (2002) emphasize that the distinction between competency-based and performance-based methods is important and propose a new model, designated the Cambridge Model, which extends and refines Miller’s pyramid. It inverts his pyramid, focuses exclusively on the top two tiers, and identifies performance as a product of competence, the influences of the individual (e.g. health, relationships), and the influences of the system (e.g. facilities, practice time). The model provides a basis for understanding and designing assessments of practice performance.

Assessment methods. In the clinical environment, faculty can readily assess any of the performance measures described above that relate directly to patient care. In these settings, trainees’ clinical skills can be assessed outside a simulated or test environment; skills such as patient communication, physical examination, clinical reasoning, case presentation and notes, teamwork, communication with clinical and non-clinical staff and professionalism. Methods of assessment include examining case records and notes for evidence of diagnostic thinking, listening to case presentations, but the most important method of assessment for clinical teachers would be direct observation. Without observing trainees at work and at the bedside, teachers cannot gather accurate data to provide appropriate feedback.

Giving feedback

In the clinical environment it is vital to provide feedback to trainees as without feedback their strengths cannot be reinforced nor can their errors be corrected (Ende 1983). It is a crucial step in the acquisition of clinical skills, but clinical teachers either omit to give feedback altogether or the quality of their feedback does not enlighten the trainees of their strengths and weaknesses. Omission of feedback can result in adverse consequences, some of which can be long term especially relating to patient care. For effective feedback, teachers need to observe their trainees during their patient interactions and not base their words on hearsay. Feedback can be formal or informal, brief and immediate or long and scheduled, formative during the course of the rotation or summative at the end of a rotation (Branch & Paranjape 2002).

**Why is feedback needed?** Feedback is essential for a student or intern to gain an insight into what they did well or poorly and the consequences of those actions. If educational goals had been established ahead of the teaching encounter or period, feedback is essential to examine accomplishment or lack thereof of stated goals, re-establish new goals and make action plans to address them (Ende 1983). It tells the learners where they are in comparison to where they ought to be and where they should go. Feedback, when well done, also promotes self-reflection and self-assessment, which are valuable traits for lifelong learning.

**Barriers to feedback.** One of the biggest hurdles to giving feedback is lack of direct observation of trainees by teachers (Ende 1983). Clinical competence cannot be assessed by written exams, self-report or third party observation, rather this needs to be observed directly by clinical teachers. Teachers are also very hesitant to provide negative feedback and frequently avoid it altogether although this can have adverse consequences on patient care. Trainees, on the other hand, may view negative feedback as a personal attack. Teachers need to establish a positive learning environment in which errors are acknowledged and feedback is expected and accepted. Frequently, feedback is non-specific and unhelpful to learners, e.g. ‘good job’, ‘bad patient communication’, etc.

**Circle 2: how the clinical teacher approaches their teaching (doing the thing right)**

**Showing enthusiasm for teaching and towards learners**

The starting point for any good teacher must be enthusiasm for the subject being taught. This has to be complemented by an eagerness to transmit this enthusiasm to others, which will necessarily result in a positive attitude to learners.
Enthusiasm for the subject is usually accompanied by a sound knowledge of the subject and a desire to learn more about it, both of which are pre-requisite for successful teaching in higher education. However, while enthusiasm, knowledge and a desire to learn more are necessary for successful teaching they are not sufficient. Teaching is a professional discipline with its own theoretical background and its own recognised techniques. A good teacher must have and apply a working knowledge of both techniques.

Understanding learning principles relevant to clinical teaching

Pedagogy versus androgy. Much of our approach to teaching and learning is based on studies in children at school and is therefore termed pedagogy. The content of learning is defined by a syllabus and the method of learning is laid down by a curriculum. Both of these may be developed by the individual teacher but are likely to have been laid down by a central authority. The pace of learning is dictated by the teacher. Knowles (1990) studied adults enrolled at evening classes in New York and realised that their approach to learning was different. He coined the term androgy to cover this approach. The content of the student’s studies is dictated by perceived need; the method of learning is selected by the learner and the pace of learning is dictated by the learner. From his observations Knowles derived a set of Principles of Adult Learning which are now widely regarded as crucial to the design of any course for adults (Box 6).

Learning theories. Theories of learning may be neurobiological or behavioural. From a pragmatic educational viewpoint the most useful at present are the behavioural theories. These can be broadly classified as individualistic (based on psychological approaches) and social constructivist (based on sociological approaches). While some of the proponents of each theory will claim that their insights are the only valid approach, the practical educator can draw lessons from all of them. It is important to recognise that the theories are attempting to describe what actually occurs in learning rather than what ought to occur.

Psychological theories. Learning and memory. There is an extensive literature on learning and memory. There appears to be a consensus that different models apply for the learning of knowledge and the acquisition of skills. Clinical teaching must deliver both modalities.

The first stage of acquiring knowledge is the activation of prior knowledge. This is followed by the acquisition of new knowledge. The new knowledge is incorporated into the memory through rehearsal which is more effective if it is done to a third party. The final stage of the learning process is elaboration. This may take the form of transforming the information into a different format e.g. summarizing words as a chart or diagram; comparing and contrasting new information with old; or drawing inferences and conclusions from the total information (Bransford et al. 1999). A slightly different articulation of this process is Schmidt’s Information Processing Theory which emphasises the link between the remembering of the new material and the prior knowledge that has been activated which he describes as encoding specificity (Schmidt 1983).

The commonest model used to describe the acquisition of skills is the conscious-competence model. This model is widely used in management training but no-one is entirely clear where it originated. Four stages of ability are described, as described in Box 7.

A fifth stage has been suggested which can be thought of as reflective competence. It is often the case that the person who is operating at the level of unconscious competence is unable to teach others the skill. The person who has reflective competence is able to perform the task without conscious thought but can if necessary analyse what they are doing in order to teach the skill to someone else (Chapman 2007).

Self-determination theory. It is self-evident that students’ learning is affected by their motivation. Williams et al. (1999) suggest that the nature of the motivation is important. According to self-determination theory there are two primary kinds of motivation – controlled and autonomous. Controlled motivation is brought about by external pressures (other people’s expectations; rewards and punishments) or by internalized beliefs about what is expected. In contrast, autonomous motivation occurs when individuals see the material to be learnt as intrinsically interesting or important. Controlled motivation leads to rote-learning with little

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<tr>
<th>Box 6. Principles of adult learning</th>
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<tr>
<td>Adults:</td>
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<tr>
<td>• have a specific purpose in mind;</td>
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<tr>
<td>• are voluntary participants in learning;</td>
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<td>• require meaning and relevance;</td>
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<td>• require active involvement in learning;</td>
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<td>• need clear goals and objectives;</td>
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<td>• need feedback;</td>
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<td>• need to be reflective.</td>
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<td>Knowles (1990)</td>
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<tr>
<th>Box 7. The conscious-competence model</th>
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<tr>
<td><strong>Unconscious incompetence</strong></td>
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<tr>
<td>The subject is not aware of the skill in question</td>
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<tr>
<td><strong>Conscious incompetence</strong></td>
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<tr>
<td>The subject is aware of the skill and recognizes the need to acquire it</td>
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<tr>
<td><strong>Conscious competence</strong></td>
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<tr>
<td>The subject has acquired the skill but needs to focus their attention on its performance</td>
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<tr>
<td><strong>Unconscious competence</strong></td>
</tr>
<tr>
<td>The subject has achieved mastery of the skill and can perform it without conscious thought; other tasks can be performed at the same time.</td>
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integration of the material into the student’s long term values. Autonomous motivation, among other benefits, leads to greater understanding, better performance, and greater feelings of competence. In addition, students who are encouraged to develop an autonomous approach to learning are more likely to act in ways that promote the autonomy of their patients.

**Experiential learning.** Most informal learning is based on experience. Kolb (1984) described the process by which this occurs in his learning cycle. Learning occurs when an individual reflects on an experience. On the basis of this reflection, the individual will develop a working theory (although they may not fully articulate it), which will lead them to take a certain course of action. That action will result in a further experience and so the cycle continues with a steady accumulation of useful knowledge. The cycle can be entered at any point. For example, an individual may be told about a theory and take action without having had previous experience of the particular situation. Different individuals will have different preferences for the starting point depending on their learning style (see below).

**Sociological theories.** Situated learning. Vygotsky, the Russian educational psychologist, postulated on the basis of his study of school children that learning was socially determined and resulted from the interaction of the child with those around her. He observed that if a child has adult or peer support she can solve problems that she is incapable of solving unaided. This difference between aided and unaided performance he called the zone of proximal development and determined and resulted from the interaction of the child with those around her. He observed that if a child has adult or peer support she can solve problems that she is incapable of solving unaided. This difference between aided and unaided performance he called the zone of proximal development and suggested that it is here that learning takes place. In other words, interaction with others is essential to learning (Vygotsky 1978).

**Communities of Practice.** Clinical activity usually takes place in teams. Such teams are important not only for the delivery of care but for the continuing professional development of the team members. Functional teams form communities of practice in which the individual members support one another. It is a feature of such groups that knowledge and skills are rapidly disseminated throughout the group. This may be through formal structures such as seminars but is more likely to be through the informal day-to-day contact between members. Lave & Wegner (1991) suggest that learners or apprentices are legitimate peripheral participants in such groups. Although they have yet to achieve full membership of the group they are allowed to take part in the activities of the group and in that way they also acquire the knowledge that is inherent in the group. Eventually, they will be absorbed into the group and accepted as a full member of the group. This transition is often marked by ceremony such as passing the final examination.

**Reflective practice.** At first sight, reflective practice might seem to be an individualistic learning method rather than a social one. However, Schon (1995) identified that reflection is much more effective when conducted with a mentor making it a social activity. He describes two forms of reflection: reflection in action which takes place during an activity, and reflection on action which takes place once that action has been completed. Both are important adjuncts to learning.

**Learning styles.** It is apparent that different individuals have different approaches to learning. There have been a variety of attempts to describe these different approaches or learning style. Some classifications focus on the cognitive aspects of learning; some focus on the modalities of learning preferred by the learners; a third group focus on the outcomes of the learning.

**Cognitive approach – Honey and Mumford Learning Style Inventory.** The Honey and Mumford Learning Style Inventory is widely used in management training. It is based on Kolb’s learning cycle and identifies four main learning styles (Honey & Mumford 1992).

- Pragmatists prefer to learn directly from experience
- Reflectors prefer to learn by reflecting on their experiences
- Theorists prefer to learn by developing explanations and working theories
- Activists prefer to learn by involvement in activity

No individual has a single preferred style of learning but each individual will display the learning styles to differing degrees.

**Modalities of learning – visual-auditory-kinaesthetic learning style.** A potentially more useful learning style questionnaire is the visual-auditory-kinaesthetic (VAK) questionnaire which is widely used in schools. The emphasis is on the subject’s preferred modality for acquiring material to be learnt.

- Visual learners prefer material that is delivered through visual media. This includes written and graphic material but also electronic visual media.
- Auditory learners prefer the spoken word to visual material.
- Kinaesthetic learners learn best when the learning involves them in physical activity.

Learners will usually display a mixture of the three learning styles although one may predominate.

**Outcomes of learning – deep/superficial learning.** The desired goal for learning is that the learners should achieve understanding of the subject. This is called deep learning. When the amount of material to be learnt is too great, or where the assessment of the learning is based purely on recall, learners will display superficial learning. Experienced students will identify those aspects of the material presented which need to be understood for future use and those which will merely need to be recalled for the purposes of assessment. They will adopt a deep learning approach for the former and a superficial learning approach for the latter. This combined approach is described as strategic learning (Newble & Entwistle 1986).

The teacher’s goal must be to develop deep learning. Because students have differing patterns of learning styles, the material to be learnt must be presented in a variety of ways. Patient-centred teaching involves all modalities of the VAK approach as the student will observe the patient, hold conversations with the patient and the instructor and will
Knowing and applying principles of giving feedback

Feedback should provide the student with the opportunity to reflect on their performance and its possible consequences. It can guide the student's future learning by identifying their strengths and weaknesses (Sender Liberman et al. 2005). The principles of giving feedback have been well-rehearsed by a number of authors. These principles include the use of mutually agreed upon goals as a guide to the feedback; addressing specific behaviours not general performance; reporting on decisions and actions not on one's interpretation of the student's motives; and using language that is non-evaluative and non-judgemental (Ende 1983). These attributes have been found empirically to be valued by trainees (Hewson & Little 1998). Feedback may be corrective (when the student's performance has been inadequate) or reinforcing (well the student has done well) (Branch & Paranjape 2002). Feedback may be formal or informal. In the clinical teaching setting timely, informal feedback is highly valued by the students.

The first requirement of feedback is that the student has a clear concept of the objective they are trying to attain. Feedback can then inform how close they have come to achieving that target and ideally what they need to do differently in order to achieve the target. Direct observation of the performance is necessary if feedback is to be effective. The objective may be a behaviour such as a clinical skill or a cognitive process such as interpreting a history.

At the simplest level feedback informs the student that they have either succeeded or failed at the task. This is common in licensing examinations where the candidate knows either that they have passed or failed but is not told why. In the clinical setting it would be more usual for the student to be told that their performance was inadequate and then a demonstration given of how it should have been done. Once again the student is not offered an analysis of what they did wrong. This approach does not provide the best opportunity for the student to learn and is more akin to evaluation than feedback.

Learning is assisted when both the strengths and the weaknesses of the student's performance are identified and discussed. Feedback is not evaluation and therefore should not use judgemental language or make personal remarks. The emphasis should be on reporting the observed behaviours and thinking and should be detailed and specific rather than general. It is a good technique to start with self-assessment as many astute learners usually identify their errors and the teacher can help make plans to correct those errors and reinforce their strengths. It is often the case that the student's judgement of their performance is harsher than the teacher's and it is important to reassure the student that they have done well.

Clinical learning often takes place in a group environment. In this setting it is helpful to involve the other members of the group in the informal feedback process. They often have valuable insights into why their colleague behaved as she did and, in addition, they will learn the process of constructive feedback. More formal summative feedback should be given in private at a mutually agreed time.
Above all feedback should be constructive. This does not mean that the student’s performance cannot be criticized but when there are deficiencies the feedback should include suggestions for making improvements.

Role modelling

An important part of clinical teaching is the development of the professional role in the students. Both trainees (Brownell & Cote 2001) and faculty (Wright & Carrese 2002) agree that the observation of role models is the most important component in this process. This fits well with the theories of situated learning and communities of practice discussed previously. If positive messages are to be transmitted consistently it is essential that teachers reflect on their own attitudes and behaviours (Kenny & Mann 2003). Modelling life long learning requires that the teacher is willing to admit ignorance and prepared to learn from the students. Good doctor-patient relationships and evidence based clinical practice are other areas where the teacher’s behaviour will reinforce (or undesirably contradict) their formal teaching.

‘Grasping the unexpected teaching moment’

Unpredictability is one of the attractions of clinical practice. There are occasions when it is better to abandon the carefully constructed teaching plan and seize the opportunity which suddenly presents itself. After all, the unexpected will be what excites you and you are likely to transmit that excitement to the students. A sound grasp of the theoretical approaches to teaching are no substitute for enthusiasm for the process of teaching and for the subject that is being taught.

A key prerequisite for using the unexpected teaching moment most efficiently is a teacher’s willingness to admit their errors or limitations, thus allowing learners to admit their own without an a climate of humiliation.

Circle 3: the clinician as a professional teacher (the right person doing it)

Even if a teacher can master all the technical competencies listed in the inner circle, emotional and attitudinal competencies such as self-awareness, self-regulation, motivation, empathy and social skills are required to achieve excellence (Harden et al. 1999).

We list the following as essential circle 3 tasks for clinical teachers by which they may become the ‘right persons doing it’.

- Soliciting feedback on teaching
- Self-reflection
- Professional development in teaching
- Mentoring.

Soliciting feedback on teaching

Most clinical teachers go about their business of teaching with very little feedback on their strengths and weaknesses as a teacher. Frequently, the only evaluations on their teaching are from learners and these too may be few and far between. Some institutions have adopted a coaching or consulting service for teachers, but these pertain more to classroom teaching or small group teaching rather than teaching in the clinical environment. More institutions should adopt a 360-degree method for evaluating their clinical teachers rather than depend on incomplete and ineffective evaluations from learners alone. These may include measures such as learners’ performance and progress as a proxy for teaching impact, video recording of teaching sessions with reflection and feedback, teacher self reports, peer observations etc.

In the face of overwhelming expectations at work, clinical faculty rarely ask for feedback on their teaching from learners or peers. The clinical environment adds an additional twist by the all-important focus on patient care and safety. Thus, frequently the emphasis is on the patient and their management and the teaching strategies are all but forgotten. In the event that a teacher asks their learners for feedback, learners hesitate to offer it as there may be some anxiety about their own evaluations by their teachers. Those learners that offer feedback give non-specific, vague feedback that teachers cannot readily assimilate or apply in their future teaching encounters.

Teachers should be encouraged to seek feedback on their teaching from peers and learners, staff development should train teachers in efficiently obtaining feedback and last but not least a teaching consulting or coaching service developed by institutions for clinical teachers would help improve teaching skills of individual teachers as well as the institution as a whole. Trainees too can benefit from coaching and encouragement on providing useful feedback to their teachers.

Self-reflection

Reflection in medicine has been defined as consideration of the larger context, the meaning, and the implications of an experience or action (Branch & Paranjape 2002) and when used properly allows for the growth of the individual. It has also been stated that professionals must distinguish themselves from technicians by awareness of the larger context of their work using this knowledge for lifelong learning and not limiting themselves to performing specific tasks (Schon 1987; 1983). One might therefore assume that reflection, so essential to educating physicians, is even more crucial for clinical teachers to adopt a professional approach to their teaching, namely be the right person doing it.

Both phases of reflective practice (Kaufman 2003), reflection in action which occurs immediately and reflection on action which occurs later, are readily applicable to clinical teachers.

Fryer-Edwards et al. (2006) have suggested three key teaching skills that illustrate learner-centred, reflective teaching practices and provide a framework for teachers with both cognitive and affective components. Although these teaching practices were developed for communication skills training, they are readily applicable to any clinical environment.
Identifying a learning edge: Teachers work with learners to identify their learning edge, which is the place where they find learning challenging, but not overwhelming.

Proposing and testing hypotheses: Teachers formulate hypotheses on issues such as barriers or facilitators to learning for individual learners, learning needs, emotional responses to patients or the rest of the team and apply teaching strategies to test these hypotheses.

Calibrating learners’ self-assessments: This involved learners thinking out aloud their self-assessment, values and beliefs and using these insights to stimulate further reflection.

Medical education has traditionally had little input from trained educators. In the past, a high level of clinical competence and experience was considered sufficient to be a good clinician educator, now it is increasingly recognized that teaching itself is a skilled profession. The British General Medical Council in its publication: Tomorrow’s Doctors, includes the following attributes of a practitioner (General Medical Council 2002).

- Recognition of the obligation to teach others, particularly doctors in training.
- Recognition that teaching skills are not necessarily innate but can be learned.
- Recognition that the example of the teacher is the most powerful influence upon the standards of conduct and practice of trainees.

Most clinical faculty receive little or no explicit training in how to teach, or in theories and processes of teaching. Yet, they are expected to help their trainees master medical knowledge, clinical skills and acquire a habit of lifelong learning. In the changing world of medicine, clinical teachers need to perform time-efficient ambulatory and inpatient teaching, while their own clinical workload keeps increasing. For teachers to succeed at their teaching tasks, faculty development is essential (Wilkerson & Irby 1998). Faculty development also helps teachers build important professional relationships with peers and mentors within and outside their institutions and contribute positively to academic advancement overall (Morzinski & Fisher 2002).

Summary of professional development programmes. Common faculty development formats include train the trainer workshops or seminars, short courses developed by individual institutions, sabbaticals, part time or full time fellowships, scholars programmes and educational workshops at conferences (McLeod et al. 1997; Steinert 1993; 2005; Steinert et al. 2006).

Workshops. The prototypical faculty development programme is a short, focused series of workshops, most of which focus on practical teaching skills development and the educational strategies directly applicable to those teaching skills. Studies demonstrate that such programmes serve a variety of purposes including improving attitudes, self-efficacy, augmenting self-assessed and actual use of specified teaching concepts; facilitating faculty’s ability to recognize teaching deficiencies; and increasing knowledge of teaching principles and teaching ability.

Fellowships. In part-time fellowships, faculty spend limited time training at another institution and then work on educational projects at their home institution. Combining the training with the practical application of knowledge and skills at home institutions, such fellowships teach the theory and practice of critical faculty teaching skills. Full-time fellowships are designed to prepare the fellows to be full-time medical educators. Although they include teaching skills, they also emphasize other important educator roles such as educational research and educational leadership.

Teaching scholars programmes. Innovative formats have been developed to link workshops into a more comprehensive programme to target a broader range of outcomes (Gruppen et al. 2003). As a result, some institutions have designed teaching-scholars programmes for their faculty. These programmes are usually a year long and serve as an immersion experience for clinical educators and most require their ‘fellow’ to complete some educational project. The Teaching Scholars Programme for Educators in the Health Sciences at McGill University (Steinert et al. 2003) and the Medical Education Scholars Programme (MESP) at the University of Michigan Medical School (Gruppen et al. 2003) were designed to create leaders in medical education. These programmes train faculty to provide curriculum design, improved teaching, educational research, and institutional leadership.

Courses at conferences. Many conferences hosted by primary care societies as well as conferences organized by medical education organizations provide a number of courses which focus on teaching and education. These courses range from 90 minute courses to all day courses. Examples of such conferences include the annual conferences of the AAMC, AMEE, Society of General Internal Medicine, Association of Teachers of Family Medicine and the Ottawa conferences.

Co-teaching or peer coaching. In this model, paired physicians focus on developing their teaching skills while sharing the clinical supervision of trainees (Orlander et al. 2000). Through teaching, debriefing and planning, co-teachers gain experience in analysing teaching encounters and develop skills in self-evaluation. Typically, a junior faculty or fellow is paired with a senior faculty educator who helps the ‘trainee’ teacher reflect on his/her teaching session.

Educational content. The content of staff educational development programmes can be classified under the following key categories.

- Teaching skills: Teaching skills sessions are designed to help participants identify their own needs with respect to teaching skills, and then to practice these skills and receive feedback from colleagues and the faculty (Pololi et al. 2001). Typical topics included in staff educational development include: interactive lecturing, small group discussion, case based teaching, giving effective feedback, promoting a
positive learning climate, communication of goals, evaluation of learners, ambulatory and inpatient teaching and physician patient communication, learner-centred learning, teaching evidence based medicine, stimulating self-directed learning, bedside teaching, etc.

- Educational leadership: This is a higher level of educational development of staff. Having acquired the basic teaching skills, some educators go on to become educational leaders. Examples of topics on the leadership track include: mentoring skills, curriculum development and reform, leadership and management of work teams, running effective meetings, small group leadership, time management, instituting change, cost-effectiveness etc.

- Miscellaneous: Additional skills include learning about instructional technology, using computers in clinical teaching and diversity for the learning environment.

Steinert (2005) has described in depth the reasons and goals of staff development for clinical teachers and also summarized types of professional development resources available.

Mentoring

Several literature reports indicate that mentoring is a useful tool in the academic progression of professionals with many successful academicians attributing their growth and success at least partially to their mentoring relationships. It has also been said that good mentors help their protégés achieve their professional goals more expeditiously. The medical world has well-established research mentoring programmes, but formal mentoring programmes for clinical teachers are scant to nonexistent. Mentors can provide guidance, support or expertise to clinicians in a variety of settings and can also help teachers to understand the organisational culture in which they work and introduce them to invaluable professional networks (Walker et al. 2002).

Most successful clinical educators have achieved their success by a trial-and-error approach, seeking multiple senior educators’ advice and mentoring on their growth as educators or just talking to their peers. If educating is to be a skilled and scholarly task, educators need mentoring. The ultimate evidence of a clinical teacher being a professional would be if they themselves start mentoring their junior or peer colleagues who wish to achieve professional success in teaching.

Engaging in educational scholarship

For clinical teachers to attain the highest level of professionalism in education and advance academically as educational innovators and leaders, scholarship is essential. Education becomes scholarship when it demonstrates current knowledge of the field, invites peer review, and involves exploration of students’ learning. Furthermore, educational work should be made public, available for peer review and reproduced and built on by others (Glassick 2000). Glassick also described six essential criteria of scholarship.

1. Clear goals
   - The purpose of the work is clearly stated

2. Adequate preparation
   - Mastery and understanding of current knowledge in the field and acquisition of skills to carry out the work
   - Identifying and obtaining the resources needed to complete the work

3. Appropriate methods
   - Using and applying appropriate methods to achieve the stated goals
   - Modification of methods to deal with changing circumstances

4. Significant results
   - Achievement of the stated goals and objectives
   - The work should add to the field and open up additional areas for further exploration

5. Effective presentation
   - Using suitable style and organization to present the work at appropriate venues
   - Presentation of results with clarity and integrity

6. Reflective critique
   - The scholar critically evaluates his or her own work
   - The scholar uses evaluations to improve the quality of future work

Points for reflection

1. How can change be sustained – Change in teaching skills as well as change in attitudes towards teaching?

Other educators have shown that a one-shot approach to educational development does not sustain change and staff development should be longitudinal. Moreover, the educational environment and institutional attitudes towards teaching need to change in order that teaching skills are considered as valuable as research skills in academia.

2. Can improving clinical teaching skills and excellence in clinical care co-exist? How can teaching initiatives be reconciled with the demands of service?

Clinicians face increasing pressures in their clinical practice and the volume of patients they care for keeps increasing. Time to see patients keeps shrinking and has often been stated as one of the foremost barriers to clinical teaching. Departments and institutions must see high quality teaching as one of their core values; maybe create a core group of faculty who would be responsible for much of the teaching.

3. Does improvement in clinical teaching matter to patient care? If teaching skills improve, what is the impact on patient management, safety and satisfaction?

This is an area that has not been investigated extensively and is a difficult area to research. Regardless, unless medical educators
demonstrate that improved teaching leads to improved patient outcomes, the public and other stakeholders may not see the value of allocating dedicated time to teaching.

(4) How should teachers be evaluated – What outcomes should be measured and who should evaluate them?

Most clinical teachers are evaluated by their trainees, often irregularly and inconsistently. Frequently trainee evaluations are subjective and cursory, thereby of little help to teachers who wish to improve their teaching skills. Trained peers, acting as coaches, may be one of the more useful ways to evaluate teaching, but time needs to be set aside for this coaching model. Microteaching or videotaping of teaching encounters can be invaluable in allowing self-assessment of teaching, but can this be carried out in the clinical environment?

(5) How can institutions and departments elevate the value of clinical teaching – The hidden curriculum, reward its teachers and nurture educational leaders?

In the clinical world, research accomplishments are often held in higher esteem than educational achievements. Expanding academic tracks, staff development, rewarding teachers and establishing clear criteria by which educators can be promoted are possible ways to elevate the value of teaching within institutions and departments.

(6) Teaching clinical skills, bedside teaching – do they really matter? Can technology answer all diagnostic questions?

For better or for worse, technology is here to stay in medicine. Clinical teachers can model appropriate use of technology in making the best clinical decisions and teach trainees the respective value of clinical data and laboratory data in patient care. Educators can further use technology to demonstrate the precision of clinical signs, discarding those that of little value.

(7) How can a clinical teacher set educational objectives when much of the learning is opportunistic? How can teachers respond to the unexpected teaching moments?

Teaching in the clinical environment is beset by frequent unexpected teaching challenges. Questions arise from patients or trainees that teachers are unprepared to answer; patient mood or severity of illness can displace preset teaching objectives. Setting a positive educational environment where teachers are willing to admit their limitations, show willingness to learn from trainees and are prepared to set aside their teaching objectives while grabbing the unexpected moment and doing opportunistic teaching are some strategies to overcome these challenges.

(8) How should teachers inform and orient patients about the teaching nature of the session – Are patients benefiting from the teaching?

If physicians are to learn from direct patient care, patients should be fully engaged in the teaching encounter. Several reports state that most patients enjoy participating in clinical teaching. A few common sense strategies can maximise their impact; introductions, orientation of patients, professionalism, patient education etc, to name a few.

(9) How can a clinical teacher target their teaching to multiple levels of learners and keep them all engaged?

A typical clinical team often consists of multiple levels of trainees from early students to senior house officers and beyond. Clinicians are often intimidated by having to engage all levels during their teaching encounters. Some ways to achieve this successfully include: giving assignments for
trainees to prepare ahead of time, allocating specific tasks at the bedside and using senior trainees to participate in the teaching.

Quotes for Teaching in the Clinical Environment

Summary: Teaching in the clinical environment is a demanding, complex and often frustrating task, a task many clinicians assume without adequate preparation or orientation.

Introduction: Due to advances in education such as new methods of teaching and learning, a more student-centred teaching, competency based assessment and emphasis on professionalism; educators today are required to have an expanded toolkit of teaching skills and clinical expertise.

General Teaching models: Two models of clinical teaching have been successfully used in faculty development of medical teachers. Both models are behaviour based and can be adapted by clinical teachers to all clinical settings.

Stanford Model: Although it (the Stanford model) provides a categorical framework for evaluation and analysis of teaching, the power of the model is most effectively demonstrated in hands-on seminars in which faculty are enabled to both understand and apply this method of analysis to their teaching.

One minute preceptor: The ‘Microskills’ of teaching, also called the one minute preceptor because of the short time available for teaching in the clinical environment provides a simple framework for daily teaching during patient care.

Applying the Dundee model: It has been stated that the medical profession needs to think more seriously about training their teachers and a framework for developing excellence as a clinical educator is needed.

Time efficient teaching: Irby & Bowen (2004) described a 3-step approach for time efficient teaching in the clinical environment. All three steps described can be adapted equally well to a one-hour session as a 10-minute teaching session.

Inpatient teaching: Ende (1997) wrote that the role of the inpatient teacher is one of the most challenging in medical education, that of a master, mentor, supervisor, facilitator, or all of the above.

Outpatient teaching: In recent years, the outpatient clinics have become an integral venue to teach clinical medicine. With shorter hospital stays, it has become impossible for trainees to follow and learn the natural history of a disease from the inpatient environment.

Teaching at the bedside: It has been stated that since clinical practice involves the diagnosis and management of problems in patients, teaching of clinical medicine should be carried out on real patients with real problems (Nair et al. 1997).

Work based assessment: Assessment plays a major role in the process of medical education, in the lives of medical students, and in society by certifying competent physicians who can take care of the public. Society has the right to know that physicians who graduate from medical school and subsequent residency-training programmes are competent and can practise their profession in a compassionate and skilful manner.

Giving feedback: It (feedback) is a crucial step in the acquisition of clinical skills, but clinical teachers either omit to give feedback altogether or the quality of their feedback does not enlighten the trainees of their strengths and weaknesses.

How the teacher approaches their teaching: The starting point for any good teacher must be enthusiasm for the subject being taught. This has to be complemented by an eagerness to transmit this enthusiasm to others, which will necessarily result in a positive attitude to learners.

Learning and memory: There is an extensive literature on learning and memory. There appears to be a consensus that different models apply for the learning of knowledge and the acquisition of skills. Clinical teaching must deliver both modalities.

Learning styles: It is apparent that different individuals have different approaches to learning. There have been a variety of attempts to describe these different approaches or learning style. Some classifications focus on the cognitive aspects of learning; some focus on the modalities of learning preferred by the learners; a third group focus on the outcomes of the learning.

Knowing and applying feedback: These principles of feedback include the use of mutually agreed upon goals as a guide to the feedback; addressing specific behaviours not general performance; reporting on decisions and actions not on one’s interpretation of the student’s motives; and using language that is non-evaluative and non-judgemental.

Role modelling: An important part of clinical teaching is the development of the professional role in the students. Both trainees and faculty agree that the observation of role models is the most important component in this process.

Soliciting feedback on teaching: Teachers should be encouraged to seek feedback on their teaching from peers and learners, staff development should train teachers in efficiently obtaining feedback and last but not least a teaching consulting or coaching service developed by institutions for clinical teachers would help improve teaching skills of individual teachers as well as the institution as a whole.

Workshops: The prototypical faculty development programme is a short, focused series of workshops, most of which focus on practical teaching skills development and the educational strategies directly applicable to those teaching skills.

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References


Balance: Can you have it all?

Susan M. Gilmour, MSc, MD, FRCP, Chair, Department of Pediatrics, University of Alberta, Stollery Children's Hospital

Have it all?
- Yes….but you just can't have it all at once…

Balancing What?
- Career
  - Patients
  - Co-workers
  - Peers
  - Supervisors
- Relationships/family
- Self
Work-Life Balance: Fact or Fiction?

Imbalance = Stress

- Stress effects both physical and mental health and we become more dissatisfied with our life.
- Stress results in $10 billion due to absenteeism and $14 billion in health-care (Canadian data).
- “Leave work too early and get home too late.”

If you can’t stand the heat don’t become a sous chef (…or a doctor…) Globe and Mail, December 2010

- Health-care practitioners have poorer balance:
  - Self neglect/denial
  - Lack of boundaries between work and home
  - Mental health
  - Substance abuse
Multi-tasking

- Doesn’t exist
- Rapid succession of single focus tasks
- Choose your tasks
- Say no
- Be engaged in the present

Combating Stress

- No single formula: Cultivate habits of personal renewal
  - Emotional self-awareness
  - Healthy habits
  - Connection with colleagues
  - Adequate support systems
  - Ability to find meaning in work

Job Satisfaction

- Doesn’t come from outsourcing the rest of your life
- Doesn’t come from financial incentives
- Comes from meaningful input (not the same thing as control)
- Solving problems…
“Don’t worry...be happy”
Depression and Burnout in Medical Training

Burnout is a syndrome of emotional exhaustion, depersonalization, and low personal accomplishment. Often, it can lead to decreased effectiveness at work. Burnout is different from depression in that it usually only involves a person’s relationship to work, whereas depression is more global.¹

As documented in multiple studies, burnout and depression occur at high rates among house officers across many specialties. In a recent survey study of 123 residents at three pediatric residency programs, 20% of participating residents met criteria for depression, and 74% met criteria for burnout.²

**Burnout**

*Emotional exhaustion:*
- Emotionally drained from work
- Depleted at the end of the workday
- Tired when you have to face another day of work
- You are working too hard on your job
- Frustrated with work
- As though you are at the end of your rope

*Depersonalization:*
- As though you do not have compassion for patients and/or colleagues
- More callous toward people as a result of your job
- Work seems to be hardening you emotionally
- Indifferent about what happens to people at work
- Blamed by people at work

*Low sense of personal accomplishment:*
- Loss of empathy for others at work
- Loss of effectiveness in dealing with the problems of others at work
- Loss of energy
- Exhausted when you work closely with others
- Unsure whether you really accomplish anything worthwhile at work
- Loss of ability to remain calm when dealing with emotional problems at work

**Depression**

*Major Depression*

Diagnosis of major depression requires at least five of nine symptoms (must include one of first two) for at least two weeks:
- Depressed mood
- Markedly diminished pleasure or interest in activities
- Significant weight loss or weight gain
- Insomnia or excessive sleep
- Agitated movements or very slow movement
- Fatigue or loss of energy
- Feelings of worthlessness or guilt
- Impaired concentration and indecisiveness
- Thoughts of death or suicide

**Atypical depression**
People with atypical depression have some, but not all, of the same features of major depression. They often have prominent physical symptoms, including weight changes and sleep disturbances, especially excessive sleep.

**Dysthymia**
Dysthymia is a chronic, low-grade depression that persists for a long period of time, usually two consecutive years, with no more than two months at a time free of symptoms. The prominent symptoms include an absence of pleasure or interest in activities, low self-esteem, low energy, and poor sleep and concentration.

**Accompanying Materials:**
Malach-Pines Short Burnout Measure. Courtesy of the Office of Clinician Support, Children’s Hospital Boston.

**References:**
4. Up-To-Date Online, 15.3. Patient Information: Depression in Adults.
Burnout is a common problem among healthcare givers. You can use the following measure to assess your level of burnout.

**Please use the following scale to answer the question: When you think about your work overall, how often do you feel the following?**

<table>
<thead>
<tr>
<th>Feeling</th>
<th>Never</th>
<th>Almost Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
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<td>Physically Weak/Sickly</td>
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<td>Worthless/Like a Failure</td>
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<td>Difficulties Sleeping</td>
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<td>&quot;I've had it&quot;</td>
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To calculate your burnout score add up your responses and divide by 10: ________

A score of up to 2.4 indicates low level of burnout; 2.5-3.4 indicates danger of burnout; 3.5-4.4 indicates burnout; 4.5-5.4 indicates serious burnout; a score of 5.5 or higher is suggestive of a need for immediate professional help.

Hospitals are complex environments. Taking care of sick patients, especially children, can be very demanding and emotionally draining. Academic pressure, hospital regulations, and differences among staff can also contribute to workplace stress.

The Office of Clinician Support is a safe place to talk. Even a few minutes can help reduce your distress. The Office of Clinician Support can be a first step. For appointments, please call 617-355-6705.

**Burnout Measure: Short Version (Malach-Pines, 2005)**
He wakes up soaked in sweat at 3:30 am, rescued by consciousness from a string of nightmares. The first was about a new reality show on television in which all of the male contestants agreed to have their penises cut off if they didn’t win. The victims seemed to tolerate the insult with equanimity.

He rolls out of bed, panting with panic. There is no point in trying to sleep a little longer. It doesn’t take a brain surgeon to understand that this man has feelings of inadequacy and insecurity and is tormented by demons.

He gets dressed, fumbling with his shirt buttons and the knot in his tie. It’s an awkward process: the end of his dominant thumb is split from the dry winter air and he doesn’t want to reopen it and bloody his clothes. He tries to get downstairs quietly, to avoid waking his wife and daughters, but his chocolate Labrador emerges from nowhere and триps him up in the dark. Body and briefcase go sprawling. His older dog, a big yellow lab, pads down the hall to check things out; she licks his head, sticking her tongue up his nose.

This is his laugh for the day. He pulls himself up, resigned to the blond dog hair now clinging to his meticulously kept clothes. He stumbles downstairs and throws on his coat. The air is frigid; he feels his way in the dark to the car. The engine won’t be warm until he pulls into the parking lot at the hospital. For three hours he answers emails, dictates discharge summaries, listens to jazz on the radio, and works on revisions of a manuscript that he is so proud of and that three journals have rejected so far.

He goes downstairs to the coffee bar and gets a large regular coffee, his only meal of the day. The hospital still has an early, empty feeling: there’s no one else in line. At 7:45 a.m. he goes to the operating room. His first patient needs to be delayed; she has had a sore throat since yesterday and has started to wheeze. Her elective back surgery was booked a month ago. He chats with the anesthesiologist, who suggests they start with one of his two other cases — both young, both requiring removal of a brain tumour.

The OR nurses, his second family, curse under their breath because they already had the room set up for the lumbar discectomy and have to rearrange it.

He gets through the two tumour surgeries and the sweet little lady with the back problem is deemed fit for surgery after inhaling from some puffers. So he gets all three cases done. Much of the surgical day is spent fussing over residents and fellows to do the surgery as well as he would but in twice the time it would take him. And one of the really good OR nurses is in a manic phase and is exhausting to be with; he’s usually the only manic one in the OR.
At the end of the day he makes quick rounds with the residents to make sure all is well: another day of doctors triumphing over disease. He ought to feel exhilarated. All of the surgeries have gone well, but he knows that the second patient will not graduate from college in two years; her cancerous brain tumour will have claimed her by then.

He stumbles back to his office at 6:00 p.m. to do paperwork and gets home at 8:30. His dogs greet him enthusiastically; his wife and daughters less so. His wife smiles wryly and tosses a meaningful glance toward the girls. Another family supper missed. He summons a loud “Hi” for each of his daughters; they reply with garbled grunts. He makes a gin and tonic and after gulping it in 20 seconds pours a glass of red wine to lubricate the rapid downing of his first meal in 24 hours. He has a bath and pours a scotch and takes it with a tall glass of water to his study, where he turns on the computer to check emails.

He writes a tormented piece like this one and falls asleep watching television, having spent many childhood hours looking for dinosaur bones in the Alberta badlands. She has used medical imagery in her work for years, while doing art shows, designing and distressing costumes for the film industry, and raising a family in Vancouver.

Lifeworks

A terrible beauty

“While we may be flesh-coloured on top,” says artist Patricia Chauncey, “there’s a whole lot more that’s underneath us that is actually shockingly beautiful.”

Chauncey’s textile art pieces vividly illustrate this idea. Some look like chunks of dinosaur hide, others like magnifications of animal cells or tissue samples. One looks like something you’d glimpse in an antismoking ad: a thick, textured mat of moist greys, browns and purples. All are potent and organic, like things excavated from the earth or the human body and exposed to daylight for the first time.

Chauncey has been interested in organic and biological subjects for a long time, having spent many childhood hours looking for dinosaur bones in the Alberta badlands. She has used medical imagery in her work for years, while doing art shows, designing and distressing costumes for the film industry, and raising a family in Vancouver.

Although she had been feeling sick for years, she was diagnosed with an aggressive form of breast cancer only last year. “By the time they found the tumour in my body it was the size of a grapefruit ... . I had a lymph node that was completely replaced by cancer. So, I moved instantly from not knowing I had cancer into metastatic cancer.” Fighting her cancer, she’s come to incorporate her awareness of her body into her art.

“Since I’ve been diagnosed with cancer ... I’ve had the opportunity, very differently than most people who are healthy, to see what that looks like. I’ve seen what my cells look like, I know what my DNA is like, I know what my skeleton looks like. I’ve been living up in the library in the cancer clinic. People think I’m reading to find out if I can improve my situation ... . But what’s amazing to me is the visuals of it. I’m absolutely fascinated by the beauty of cells, and by how magical the connection between body parts and everything is. ... [Cells] are like gardens, they’re like little constellations. I mean they’re just absolutely amazing. Sometimes the cells that are pretty are the ones that are sick.”

These are the images and ideas that Chauncey incorporates into her art. She works in destructive textiles, which involves “slashing, cutting, burning, melting and leaving [metal] in the yard to rust, and applying different kinds of materials so that the textile takes on a different form. You can start with a plain cotton and come out with something entirely different, or a plain white piece of polyester and have something that’s very three dimensional and very carved-up, very mineral-like. It takes on completely different qualities.” Her work also includes embroidery, dyeing, printing and silkscreen techniques. She studied at Capilano College under Leslie Richmond, one of the world’s foremost destructive textile artists.

Some of her work consists of mem-