Art and the Art of Medicine: enhancing observational skills

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PRINCIPLES AND PROBLEMS OF OBSERVATIONAL SKILLS

- ACTIVE VISUAL SEARCH
- OBJECTIVE OBSERVATION
- HIGH THRESHOLD
- INTELLECTUAL BUT NOT PRACTICAL UNDERSTANDING OF HOW TO SEE
Medical Education

ROTE MEMORIZATION OF FACTS AND PATTERNS

ANALYTICAL OBSERVATIONAL SKILLS NOT TAUGHT
MEDICAL EDUCATION

MEDICAL SCHOOL  ROTE MEMORIZATION

HS TRAINING  ROTE APPLICATION

PRACTICE <5 YR  ROTE APPLICATION

PRACTICE >5 YR  DEDUCE, INTEGRATE & INNOVATE

Nobel Laureate Herbert Simon's law: It takes ten years to master any skill.
MEDICAL EDUCATION

MEDICAL SCHOOL

ROTE MEMORIZATION

PRACTICE > 5 YRS

DEDUCE, INTEGRATE & INNOVATE

Nobel Laureate Herbert Simon's law: It takes ten years to master any skill.
“LEARN TO SEE, LEARN TO HEAR, LEARN TO FEEL, LEARN TO SMELL, AND TO KNOW THAT BY PRACTICE ALONE YOU CAN BECOME EXPERT.”
PAPPWORTH – A PRIMER OF MEDICINE

“INSPECTION SHOULD ALWAYS BE AN ACTIVE SEARCH FOR EVIDENCE AND NEVER JUST A HURRIED GLANCE OR BLANK STARE.”
“WE NOTICE ONLY WHEN WE LOOK FOR SOMETHING AND WE LOOK WHEN OUR ATTENTION IS AROUSED BY SOME DYSEQUILIBRIUM, A DIFFERENCE BETWEEN THE EXPECTATION AND THE INCOMING MESSAGE”
“DISTINCTION SHOULD BE MADE BETWEEN WHAT WE REALLY SEE AND WHAT WE INTELLECTUALLY INFER.”
Adult Stem Cell Reports Overplayed.
Vastag B. JAMA 286:293,2001

EXPERTS: “...IF YOU READ THE LITERATURE, IT SAYS THESE ADULT STEM CELLS CAN DO EVERYTHING...LOOK AT THE LITERATURE...MORE CRITICALLY...MANY OF US DOUBT MAJOR CONCLUSIONS...I DON’T THINK THERE’S FRAUD OR ANYTHING MALICIOUS THAT ANYONE HAS REALLY DONE...BUT WHEN YOU WANT TO SEE SOMETHING, YOU CAN SEE IT.”
GOALS

LOWER OBSERVATIONAL THRESHOLD

ANALYTIC OBSERVATION AND NOT JUST ROTE PATTERN RECOGNITION

RECOGNIZE EXISTING PATTERNS OF DISEASES AND DISCOVER MANIFESTATIONS OF NEW DISORDERS
ADRIAN-HARRIS D:

ASPECTS OF VISUAL PERCEPTION IN RADIOGRAPHY.

RADIOLOGY 45:237-243, 1979
NUSSLEIN-VOLHARD C.

KRÜPPEL, A GENE WHOSE ACTIVITY IS REQUIRED EARLY IN THE ZYGOTIC GENOME FOR NORMAL EMBRYONIC SEGMENTATION

DEVELOPMENTAL BIOLOGY 104;172-186, 1984
It is very difficult to use patients, which are familiar objects, to teach observational skills because even if the high threshold for observation could be overcome, one is still left with the reality that pointing out details to students leads to memorization of the details and does provide the stimulus to develop a visual analytic process.

Teaching observational skills to students cannot be accomplished by lectures alone. One needs a visual training exercise which the examination of paintings followed by an objective description provides.
IN A FOREIGN OBJECT (PAINTING) ALL THE VISUAL FEATURES HAVE IDENTICAL PRIORITIES FOR THE VIEWER.

ALMOST EVERY DETAIL WILL BE DESCRIBED.

THIS LOW THRESHOLD IS TRANSFERABLE TO THE PHYSICAL EXAMINATION.
The narrative English paintings we use are an excellent surrogate for a patient:

They exhibit a large number of well defined details (signs and symptoms)

which often are internally contradictory (allowing for a differential diagnosis and illustrating the problem of handling data that do not support your initial conclusions) and

which can be used as concrete examples, rather than having a theoretical discussion, to introduce these concepts in clinical medicine to first year students.
After the differential diagnosis (all possible interpretations of painting) is constructed, the painting can be reexamined for other visual clues (equivalent of additional laboratory tests) to refine the differential diagnosis.

The use of paintings also highlights the problems of premature conclusions based on incomplete data; what to do with data that do not fit your initial conclusions (discard or begin again); and looking for data that only supports your initial conclusions.
Study Design

First year volunteer Yale medical students divided into intervention (i) and control (c) groups. Before visiting the museum to examine paintings (i) or attending an anatomy lecture (c) or working with tutors to learn the principles of history taking and physical examination (c), the students take a pretest and following their group’s activities take a posttest. Pretests and posttests each consist of 3 pictures of patients with a variety of medical disorders. Subjects are given 3 minutes per picture to write a description of what they observe. After the study was concluded, the descriptions were graded blindly and a point was given for every feature the student described. The difference between the pretest score and the posttest score was subjected to statistical analysis.
<table>
<thead>
<tr>
<th>1998-2000</th>
<th>PRE</th>
<th>POST</th>
<th>SIG</th>
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<tr>
<td>YCBA=81</td>
<td>50% ± 0.1</td>
<td>57% ± 0.1</td>
<td>P= 0.0001</td>
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<tr>
<td>CNTRL=65</td>
<td>47% ± 0.1</td>
<td>46% ± 0.1</td>
<td>P=0.2</td>
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Figure 13. Percentage of subjects by control and YCHA group assignments whose scores improved, remained the same, or did not improve between their pre-test and post-test examinations.
Figure 5 Mean raw score for each photograph from students receiving Set A as a pre-test in 1999-2000.
Figure 6 Mean raw score for each photograph from students receiving Set B as a pre-test in 1999-2000.
CONTEMPORARY MAJOR FACTOR UNDERMINING CAREFUL OBSERVATION OF PATIENTS

NEED TO SEE MORE PATIENTS IN A FIXED TIME (ONLY THE URGENT PROBLEM IS EVALUATED AND THE REST OF THE PATIENT TENDS TO BE NEGLECTED)

TOO MUCH RELIANCE ON IMAGING TECHNIQUES AND LABORATORY TESTS FOR MAKING DIAGNOSES
Sir Dominic Corrigan, cardiologist 1853

“THE TROUBLE WITH MANY DOCTORS IS NOT THAT THEY DO NOT KNOW ENOUGH BUT THAT THEY DO NOT SEE ENOUGH.”
Case #1

1999 Unable to bite nails because dental bite was off.
2001 Septal deviation surgery because of problems breathing through nose. Nasal tissues observed to be thickened at time of surgery.
2003 Dentist noted expansion of maxilla.
1/2009 CC: back pain led to studies revealing osteoporosis and detection of low testosterone.
5/2009 Endocrinologist #1 detected elevated growth hormone and consulted with colleagues as to future workup.
5/2009 Endocrinologist #2 looked at him, made dx acromegaly and arranged for MRI. Small pituitary tumor found.

Case #2*

1994 Trouble sleeping more than 90 minutes but no sleep apnea. “Allergies” causing stuffy nose. Hypertension, hypercholesterolemia.
2007 Osteoporosis discovered after foot fracture. Onset acne vulgaris. Dental bite requires braces. MD notices big hands and bones. Suspicion acromegaly. Growth hormone elevated. MRI small pituitary tumor removed. Hands, feet, hands shrink; nasal tissues shrink and “allergies” disappear; hypertension resolves; sleeps normally. Had seen many doctors; only one spent time looking at him and listening.

LESSONS TO BE LEARNED FROM THESE THREE CASES BY PHYSICIANS AND STUDENTS:

Inattention blindness: we don’t see something because it’s not what we were expecting to see; it’s not what we are looking for.

Sherlock Holmes: “I have trained myself to notice what I see.”

Need to see the whole picture even when the complaint that brings the patient to medical attention is commonplace like insomnia.

Need to lower the threshold of observation so that the normal becomes as important as the abnormal. Then all the details in an object from the normal to the abnormal become visible to the viewer.
PROGRAM ADOPTION IN WHOLE OR IN PART

BROWN
DUKE
UNIV. COLORADO
CORNELL
UNIV CALIF IRVINE
UNIV ROCHESTER
UNIV TEXAS AT HOUSTON
MT. SINAI
NYU
STANFORD
UCSF

USC KECK SCHOOL OF MED
NEW YORK MEDICAL COLLEGE
JEFFERSON MED SCHOOL
COLUMBIA P&S MEDICAL CTR
TOURO MEDICAL SCHOOL (NYC)

under development:
MOUNT HOLYOKE (undergraduate)
UNIV. NEBRASKA MEDICAL CTR
HARVARD MEDICAL SCHOOL
DOLEV JC, FRIEDLAENDER LK, BRAVERMAN IM
USE OF FINE ART TO ENHANCE VISUAL DIAGNOSTIC SKILLS
JAMA 286: 1020-21, 2001

WORKSHOP ON OBSERVATIONAL SKILLS

YALE CENTER FOR BRITISH ART
IRWIN M BRAVERMAN MD
PROFESSOR OF DERMATOLOGY

LINDA FRIEDLAENDER MS
CURATOR OF EDUCATION YCBA
Critical reading and critical thinking not taught in Japan. Development of sensibility is encouraged.

- Program for Language Arts for 5-18 yr olds that was conceived after her high school education in Germany.
- 5-12 yrs: sessions last 10-50 minutes depending upon illustration. Picture interpretation based on reasoning.
- Written compositions about pictures initiated at age 10.
- 13-18 yrs: Texts are analyzed in written form.
So it’s true he thought, it’s really true.
end