Art and the Art of Medicine: enhancing observational skills

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STERLING HALL OF MEDICINE

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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

JUMP START

ROTE MEMORIZATION

PRACTICE > 5 YRS

DEDUCE,INTEGRATE & INNOVATE

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

Sir William Osler

“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."

GOMBRICH

“ 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”

Pappworth – A Primer of Medicine

"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

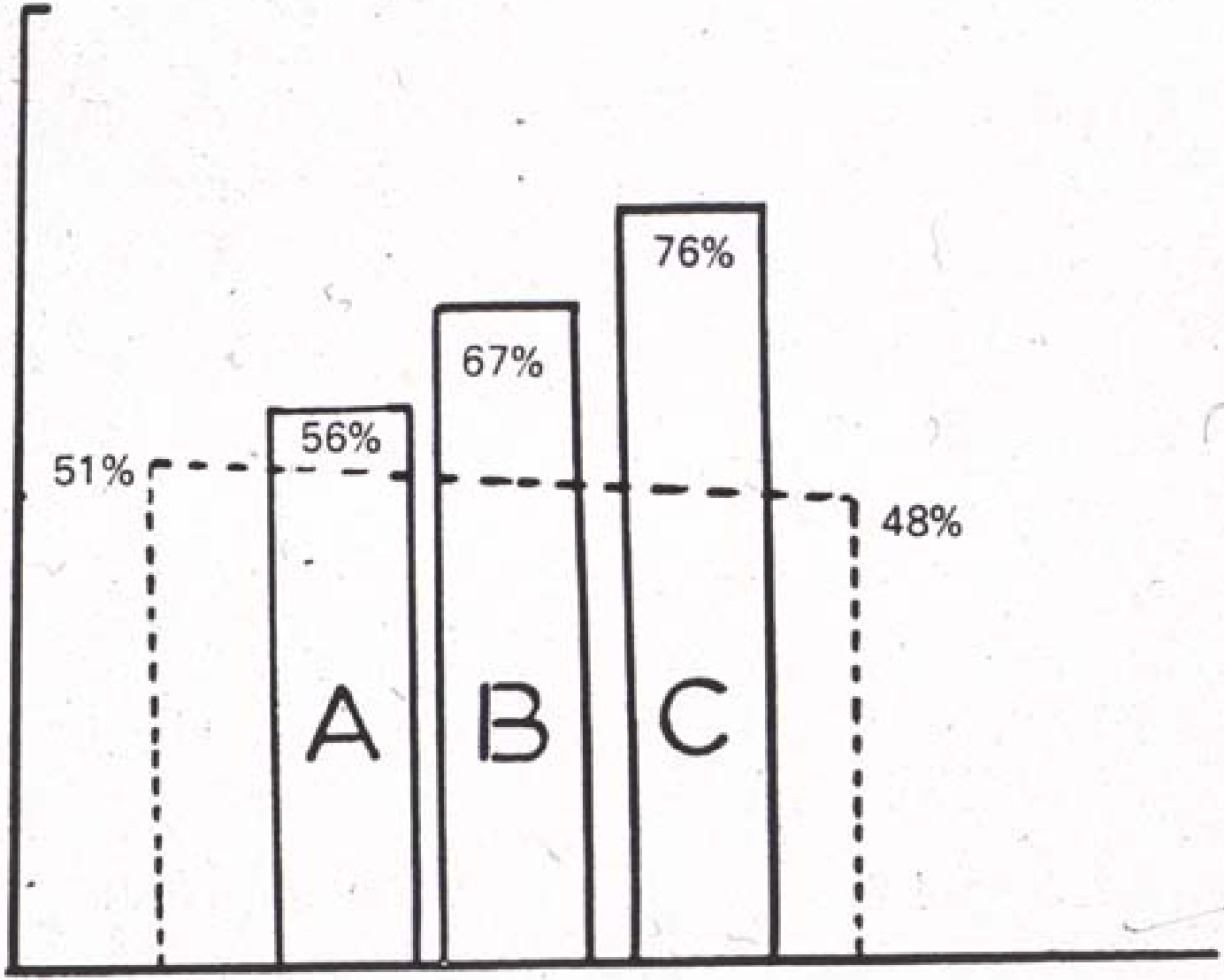
RECOGNIZE EXISTING PATTERNS OF DISEASES AND DISCOVER MANIFESTATIONS OF NEW DISORDERS

ADRIAN-HARRIS D:

ASPECTS OF VISUAL PERCEPTION IN RADIOGRAPHY.

RADIOLOGY 45:237-243, 1979

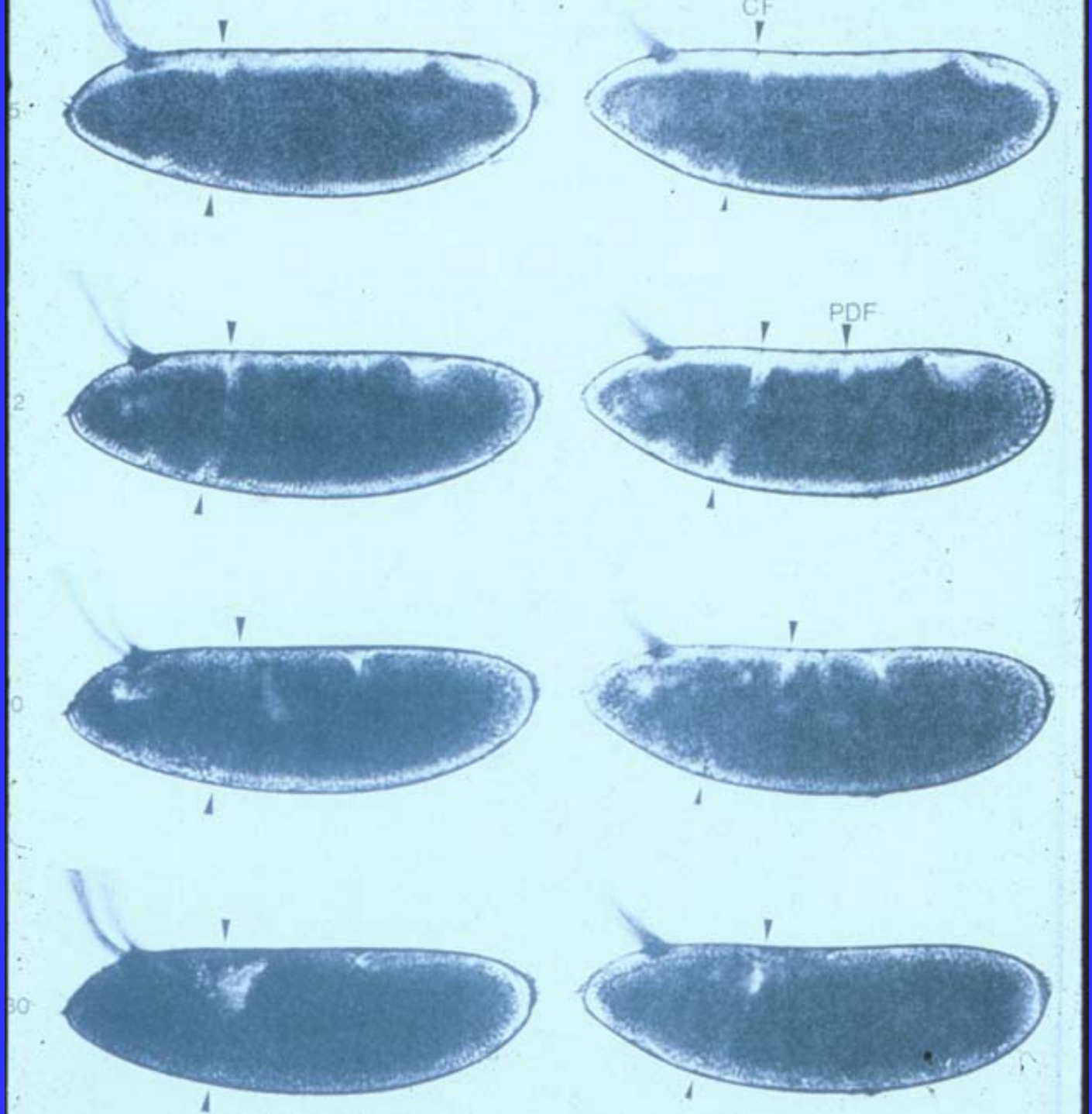
MYWZS	XSMZW	NYSZX	WNPSX
WMYJN	PYMSN	PMSZN	ZJSNQ
SZXPQ	XZJQW	QJWXY	YMWXP
NPWSM	XQWMJ	YSNMP	PQWXZ
XZQYJ	ZSNYP	QJXWZ	YMNWJ
XSYJM	YQMZJ	XQPZM	PQJMW
WPZQN	PXWZS	YJNSW	XZSNY
WQJZY	MXSNM	XYMWP	MSZYX
XPSNM	WYZJQ	SQZNJ	JPQWN
JQYNA	NXWYP	XJSQZ	JXSPN
WYMSZ	QSMLJ	MYNPW	YMWQZ
SJPQZ	JXYZQ	SZNPX	QYWMJ
NMXWY	PSNWM	MJQYW	XNSPZ
SNMYQ	QMJNY	ZNMWJ	MJZXS
WPZXJ	ZPWSX	PXQSY	PNYWQ
NQZJS	MSXNQ	WYSZM	ZSYPN
MXYPW	ZWPYJ	XNPJQ	XJWMQ
MSJZW	JWNSP	NSJWX	WYSQM
PYNQX	XQMZY	YMQPZ	XPZJN
XMZJN	ZQMYP	XMWPN	MNXWP
PYQSW	WNXJS	YZJQS	SQWZJ
XMWYQ	QNMJX	NESYQ	QYSMN
ZNPSJ	SWZPY	ZJPMW	PZWJW
WJZXY	IYZNW	ZMPXW	MJNYX
MNSQP	QPXMJ	QJYSN	WZQSP
QYZJN	WZPJM	MQWSN	WNPZS
WXSPM	XQSYN	JPYXZ	YQJXM
ZJPMY	NJQPX	MSYZP	JMPSZ
QSWXN	ZYSWM	JXWQN	WYNXQ
WYNXP	PXSYN	PYMXW	QMJSX
QJSMZ	MQWJZ	SJZQN	PZYWN
SQMYX	PXYWN	ZJYXQ	SZNYQ
PWJZN	SMQJZ	WXMYP	WJPMX
NMYWJ	QXYPZ	XMJZW	QZWYM
SZPQX	WMJNS	MNWPS	SJXNP
ZPJWX	JNWSP	PYSWM	NAPWX
YNQMS	YMXZQ	QPNSY	QSYMZ
QMSZP	NWPMQ	YWZMP	JMSNZ
JXNWY	XZJSY	NPZSJ	YXQWP
WYSXZ	PJSYX	QJXNS	MJQWN
JPQNM	NQZMW	ZMPSW	SXYPZ
YWPXQ	MSXYN	YMQSX	YNXPW
ZJNMS	ZWPJQ	SZNWQ	QMJZS
YWJXQ	NPXJZ	QYJXN	MPJNZ
SNPZM	YSMQW	SZXMJ	WSQYX
MXYQW	PSZXJ	MJPXY	MJXWP
NJPZS	QMNYW	QWPMN	ZNQYS
NSXJZ	MYPWN	NQYWP	JSNWM
PQMWY	ZXQJS	JSZXY	ZXPQY


76%
67%
56%
51%
48%
A
B
C

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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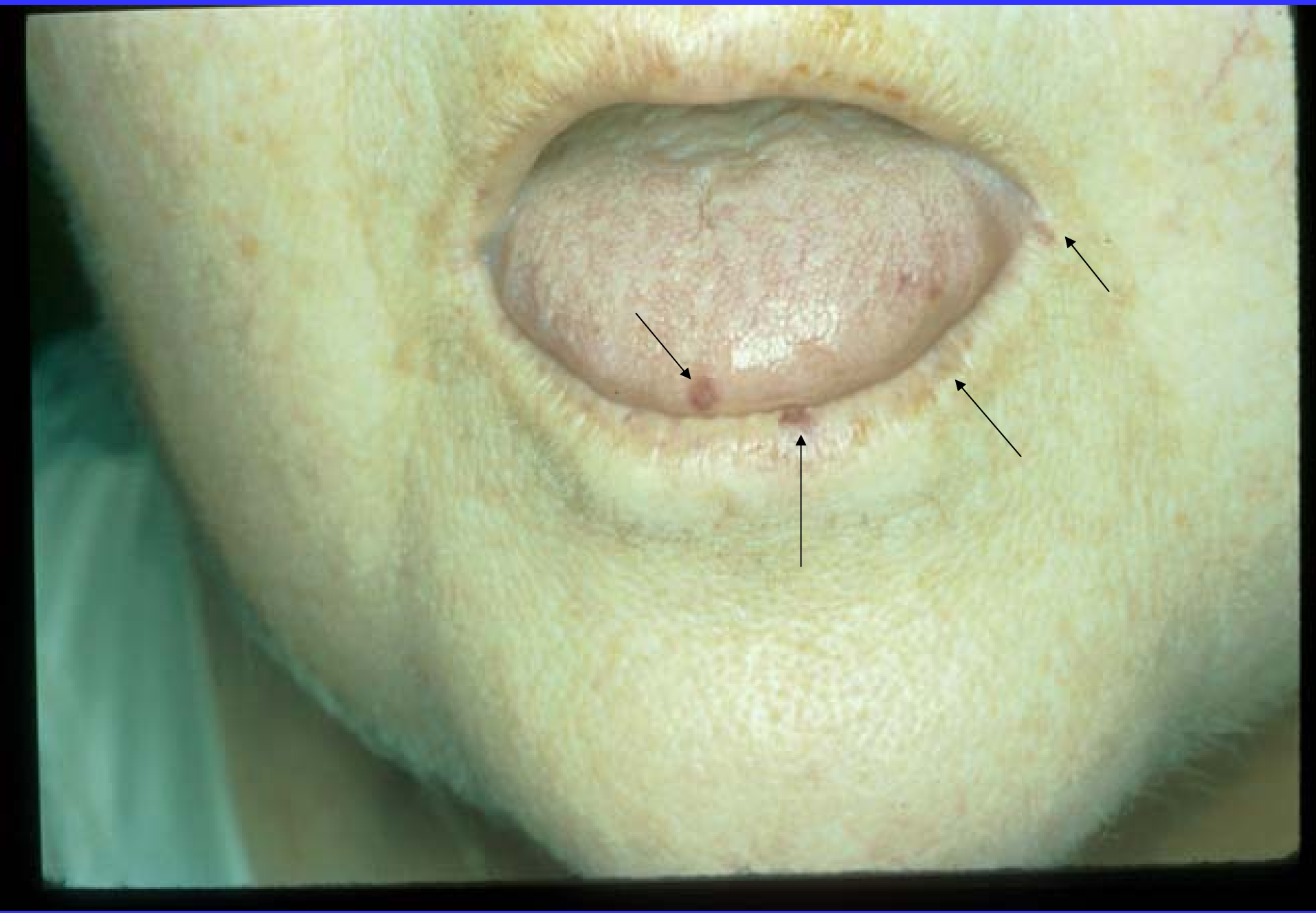

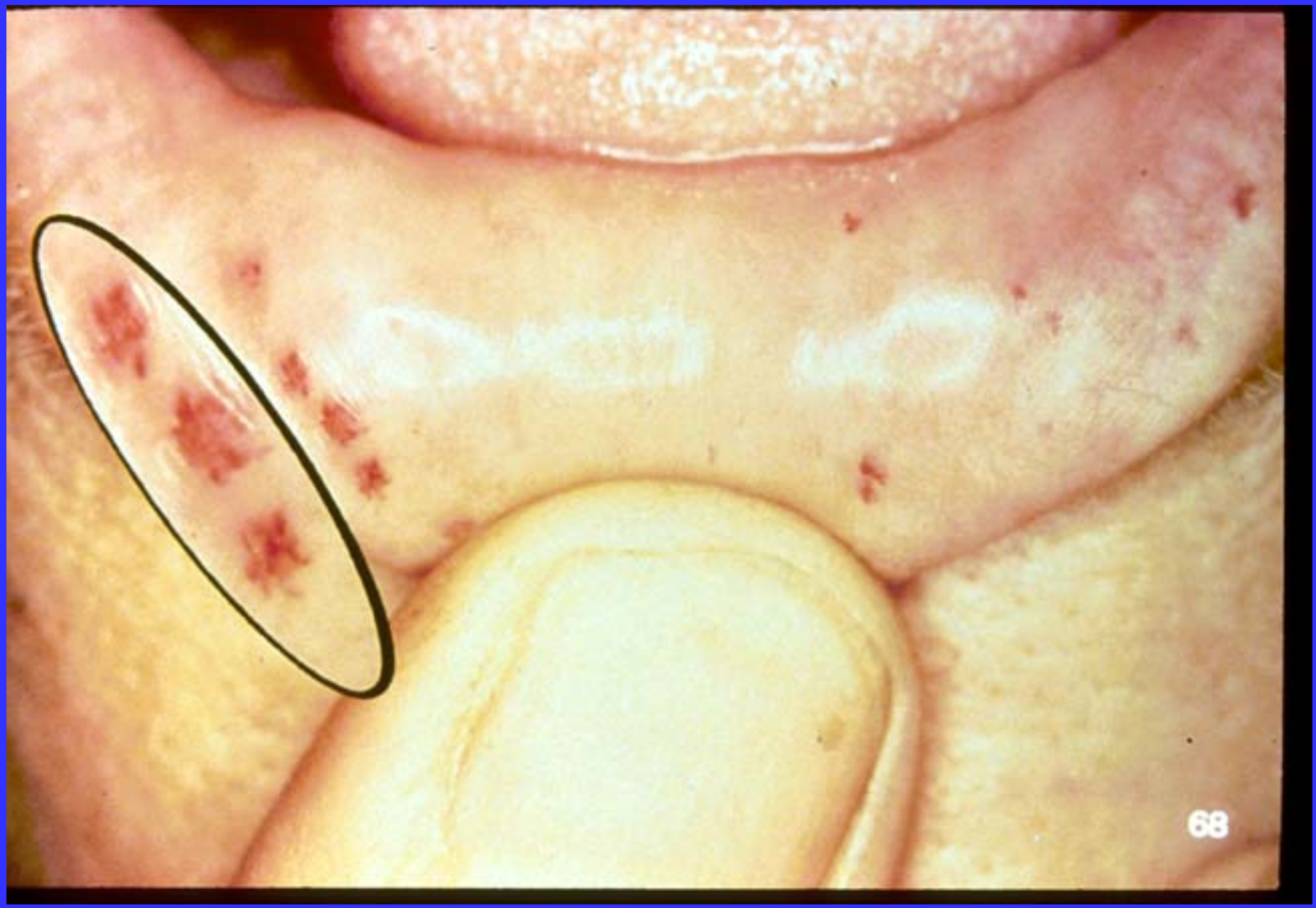
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It is very difficult to use patients, which are familiar objects, to teach observational skills because even if the high threshold for observation could be overcome, one is still left with the reality that pointing out details to students leads to 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.

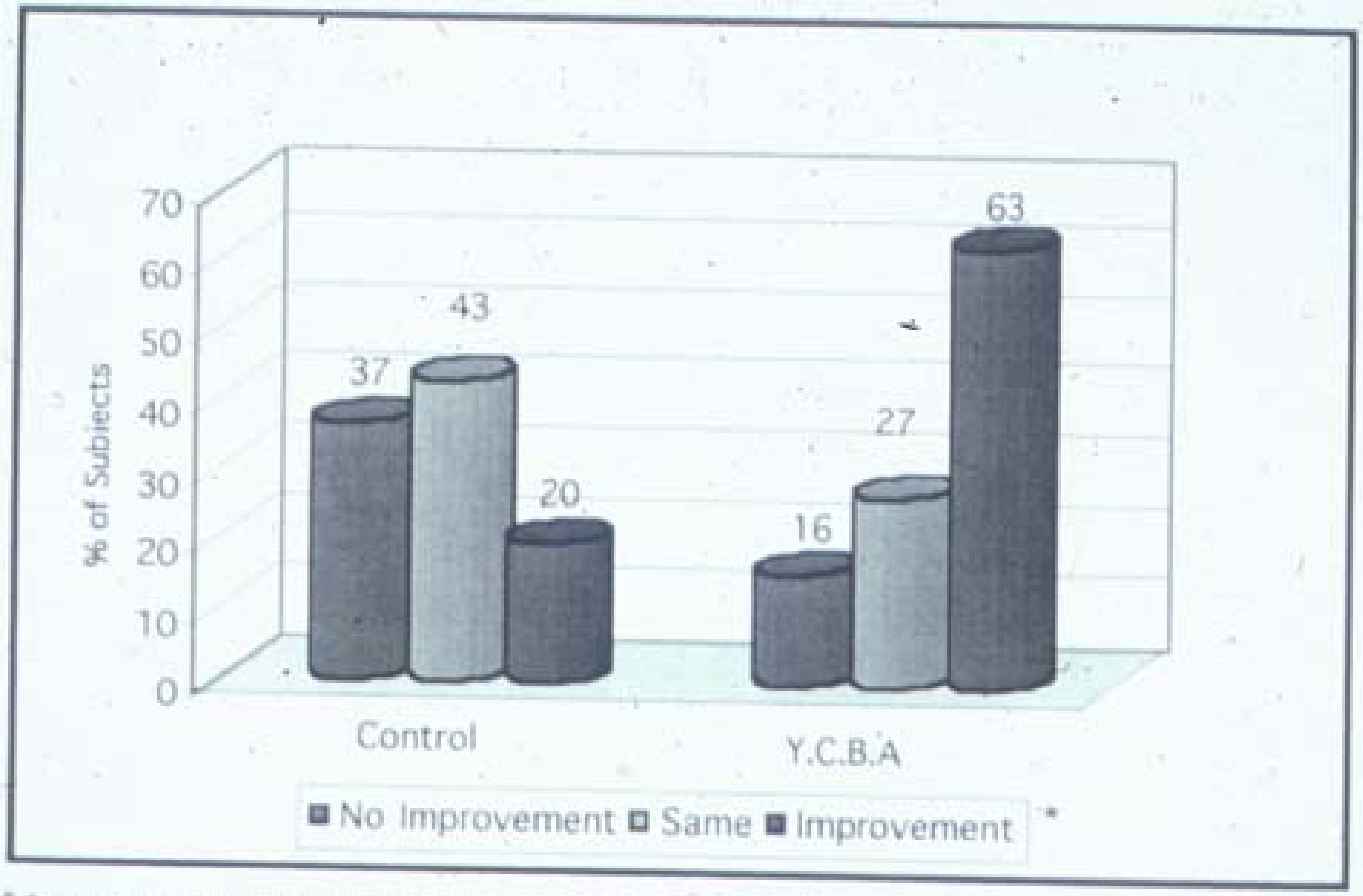
The use of paintings also highlights the problems of premature conclusions based on incomplete data; what to do with data that do not fit your initial conclusions (discard or begin again); and looking for data that only supports your initial conclusions.

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.

CUMULATIVE MEANS

1998-2000	PRE	POST	SIG
YCBA=81	50% ± 0.1	57% ± 0.1	P= 0.0001
CNTRL=65	47% ± 0.1	46% ± 0.1	P=0.2



* Improvement = Pre-test and Post-test score difference ≥ + 5%, Same = Score difference ≥ - 5% and ≤ + 5%, No Improvement = Score Difference ≤ - 5%

Figure 13. Percentage of subjects by control and YCBA 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*

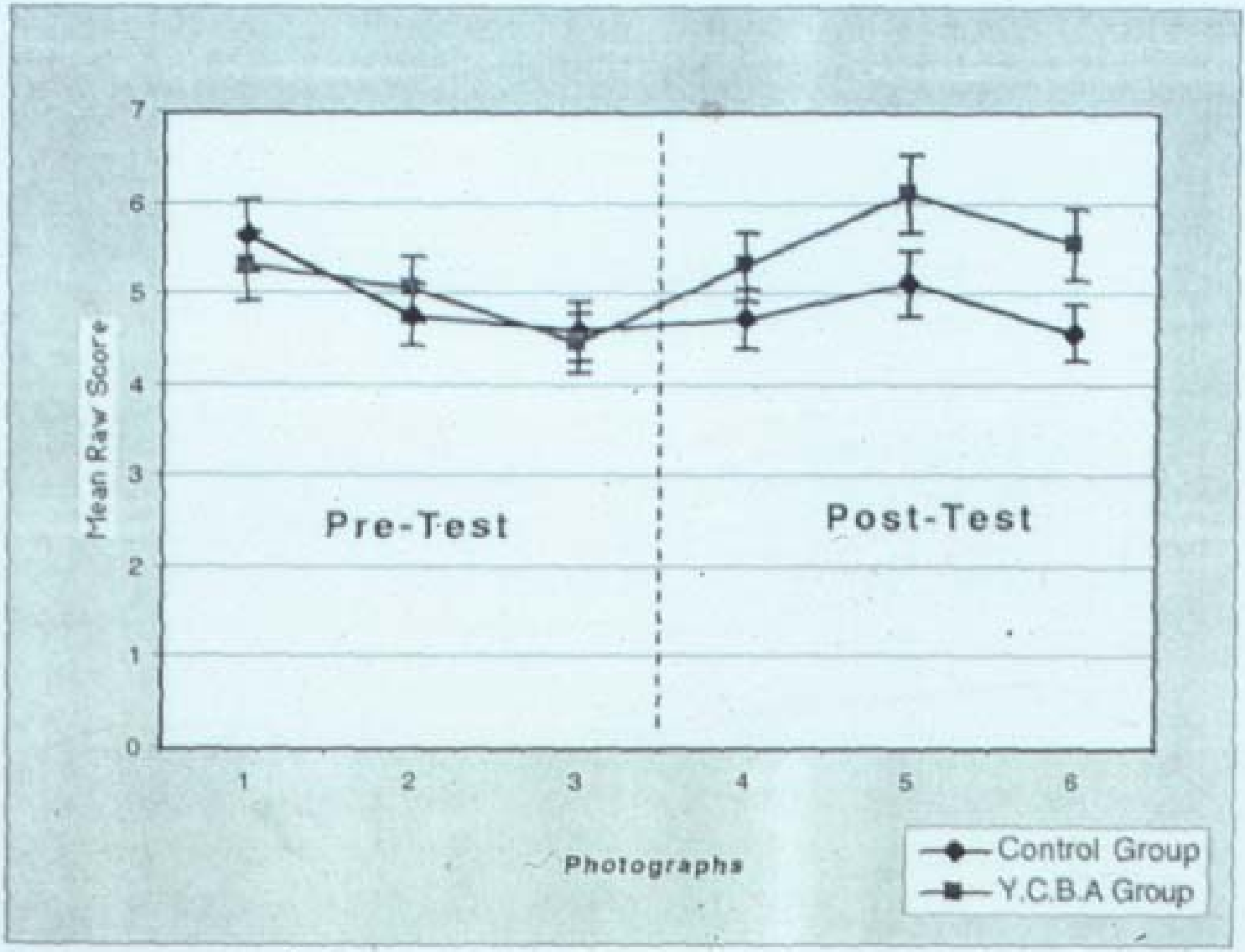
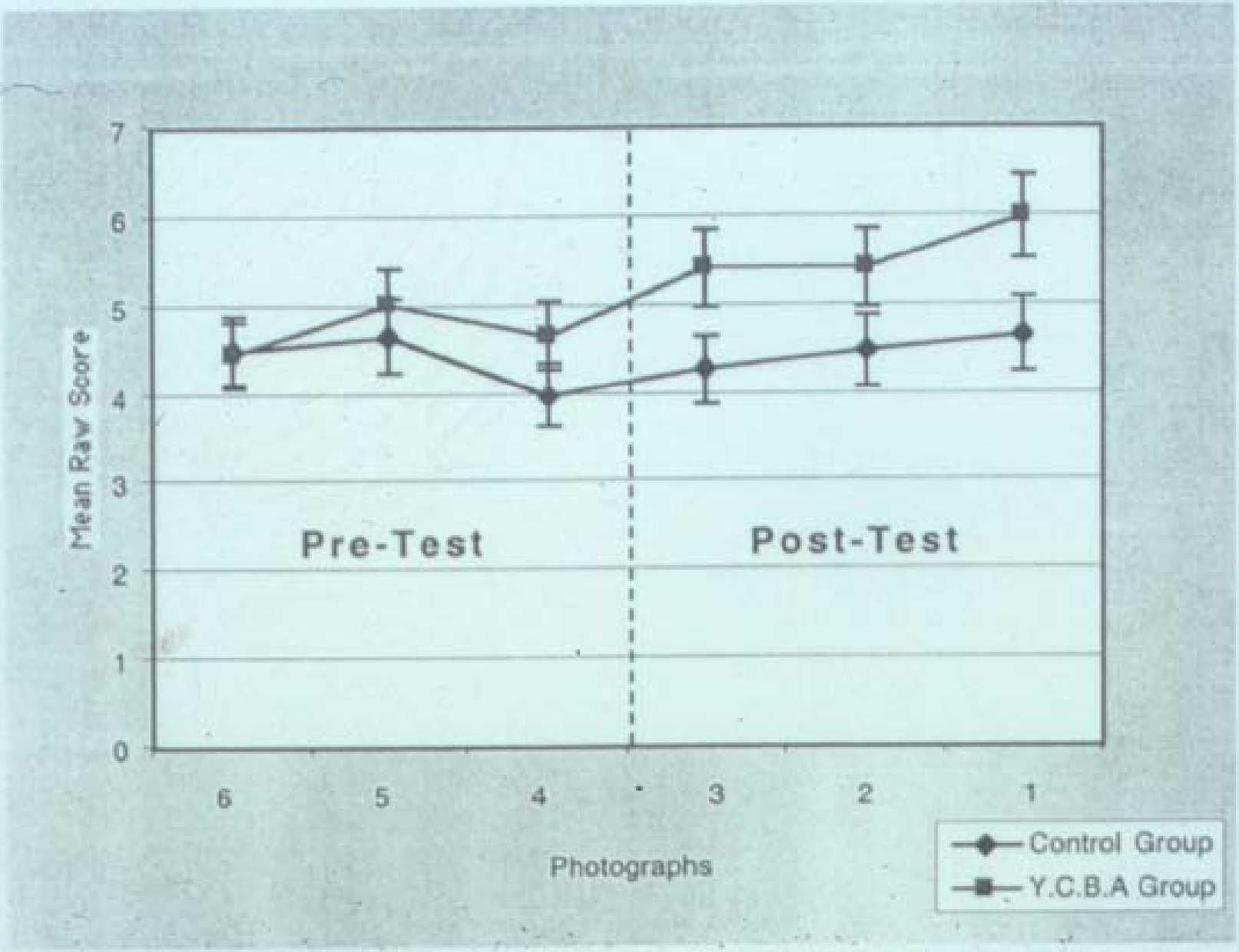


Figure 6 *Mean raw score for each photograph from students receiving Set B as a pre-test in 1999-2000*



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.

* Lisa Sanders. Diagnosis. Sleepless. NY TIMES 5/10/09 pp.17-18

CASE # 1

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

Developing Children's Skills For Informational Analysis With Picture Books

Yurika Sammori, Director, Tsukuba Institute for Language Arts

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.

THE HARP by Chris Van Allsburg

So it’s true he thought, it’s really true.

Setting
Opinion
Reason for opinion

What season is it ?
Opinion
Reason for opinion

What is the weather like ?
Opinion
Reason for opinion

What time is it ?
Opinion
Reason for opinion

Who is present and why are they there ?
Opinion
Reason for opinion

What is happening ?

What is the story behind this picture ?
Opinion
Reason for opinion

end