



57th Annual Scientific Meeting
American Society of Cytopathology

**Where Diagnostic Medicine is Headed:
*The Future Lies Within the Cell***

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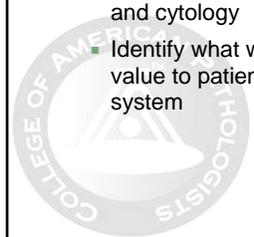
Conflict of interest

The following speaker stated they had no relevant financial relationships with commercial interests:

Jared N. Schwartz, MD, PhD

Objectives

- Discuss factors that are accelerating changes in the delivery of health care
- Explore the implications for pathology and cytology
- Identify what we can do to enhance our value to patients and the healthcare system



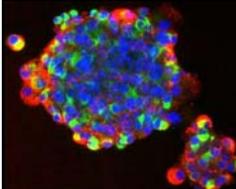
New Frontiers Lecture

"The frontiersmen were the true dreamers of the nation. They really were the possessors of a national vision. Not statesmen but riflemen and riders made America. The noblest conclusions of history still rest upon premises which they laid. But, in its broadest significance, the frontier knows no country. It lies also in other lands and in other times than our own. When and what was the Great Frontier? We need go back only to the time of Drake and the sea-dogs, the Elizabethan Age, when all North America was a frontier, almost wholly unknown, compellingly alluring to all bold men. That was the day of new stirrings in the human heart."




Why am I here? Preach a Theme

- Lecture**
- From Wikipedia, the free encyclopedia
- A **lecture** is an oral presentation intended to present information or teach people about a particular subject. A politician's speech, a minister's sermon, or even a businessman's sales presentation
- Though lectures are much criticized universities have not yet found practical alternative teaching methods for the large majority of their courses. Lectures delivered by talented speakers can be highly stimulating; at the very least, lectures have survived in academia as a quick, cheap and efficient way of introducing large numbers of students to a particular idea or field of study.
- Lectures have a long history in churches, community centers, libraries, museums, and other organizations have hosted lectures in furtherance of their missions or their constituents' interests.

"The basis of disease is the cell."

- Rudolph Virchow

What is driving the anxiety over the opportunities for pathologists and cytotechnologists?



Are we fighting the 'boogeyman' in the closet?



Yes We Are!



Example: For years, the telephone served only one purpose: Talking

Design improvements enhanced audio communication and extended distance ranges

New functionality expanded the value of the phone; conference calls, caller ID, video, mobility



1870 1950 1970 2010

Today, the phone is no longer primarily an audio communication device; we have picture phones, multimedia video messaging and 3G/4G; it is hard to remember life without these capabilities??!

Message to the *whole* of pathology: "United we stand, divided we fall"

transforming pathology transforming health care



- All of pathology is impacted by the same trends.
- New knowledge and technologies are breaking down the barriers of all of our artificially created barriers

College of American Pathologists

Are we just glorified technicians?



"What happens at the moment is that a surgeon roots around inside a patient, removes as much tumour as he can find, and hopes he got it all. He then sends what he has excised to a laboratory, where a technician checks the sample all around the outside of the extracted mass to see if it is encapsulated by healthy tissue."

Apology: We would like to apologise to the world's pathologists for suggesting that the histological examination of excised tumours is carried out by "technicians", as suggested last week in "Illuminating surgery". The pathologists who perform this work are, of course, physicians who specialise in examination of tissue samples.

The Dark Daily: New Technologies and New Science Poised to Reshape Anatomic Pathology - March 16, 2009

- A rapid uptake in clinical practice of new molecular assays for primary diagnosis of a growing number of cancers
 - Use of computer-aided diagnosis of the image, or pattern recognition features to guide the pathologists to a very precise answer
 - Less reliance on the microscope as the primary tool; more cancer cases diagnosed using a combination of standard microscopy and other assays or techniques
- Revolutionary changes in the histology laboratory will finally address the variability in the quality of specimen processing and preparation—both within a histology laboratory and across other histology laboratories within a region
 - Use of Lean and similar work flow optimization methods in support of histology automation solutions

Optical diagnosis of small colorectal polyps at routine colonoscopy (Detect InSPECT ChAracterise Resect and Discard; DISCARD trial): a prospective cohort study

“Dispensing with formal histopathology for most small polyps found at colonoscopy could improve the efficiency of the procedure and lead to substantial savings in time and cost.”

Ana Ignjatovic, BMBCh, St. Mark's Hospital in Middlesex, England and colleagues concluded in an article published online in *The Lancet Oncology*

“Perceived” Threats in Cytology

- Vaccines
- Automation
- Molecular methods including proteomics
- Smaller specimens
- In vivo* and *in vitro* imaging and biomarkers
- School closings
- Plenty of others....

Fear of the Vaccine: Gardasil

“...the incidence of cervical cancer in the U.S. is already so low that “even if we get the vaccine and continue PAP screening, we will not lower the rate of cervical cancer in the US.”

...conventional treatment and preventative measures are already cutting the cervical cancer rate by four percent a year...Even if 70 percent of women get the shot and required boosters over the same time period, which is highly unlikely, Harper says Gardasil still could not claim to do as much as traditional care is already doing.”

Realities: NOW and LATER? Why do we view these new “things” with fear

- Although current methods are still common and effective
 - HPV vaccines will continue to improve and that is good
 - In the medium/long term, screening will not totally go away
- Molecular and quantitative methods are an opportunity, and if not accepted now.
 - Cytology as a subspecialty will fade away.*
 - Cytologic characteristics will continue to be used to narrow diagnosis
 - But increasing use of ancillary tools such as IHC, molecular methods, cytogenetics, and gene profiling will determine the diagnosis for most serious diagnostic problems

What is the unique value we bring to the patient?

- Try and describe that in one sentence
- New Frontiers really means starting over
- Cytology is the “study of the cell”
- Cytology is not just morphology
- Cytology is trying to understand the cell and I would add its contents
- What we do is study the cell and based on that analysis we make diagnostic decisions and will increasingly determine prognosis and therapy

So What are Cytopathologists

- The reality is our value to patient care is increasing so fast with all these new modalities that it has initiated a common phenomena: first fear, then anxiety, then doubt, then wonder, then excitement, then enthusiastic acceptance
- Cytology is Pathology
- Pathology is Medicine
- **Cytopathologists are:**
- **Physicians who study the cell for evidence of disease and in addition have tools to determine prognosis and recommend treatment options**

Labor shortages are not unique to the US



REUTERS

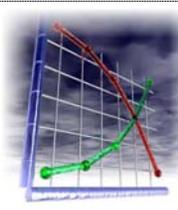
Quest Diagnostics to Provide Diagnostic Testing Services for the Women of Ireland...

“...Through a contract with the Irish National Cancer Screening Service (NCSS), Quest Diagnostics will provide quality-assured screening services intended to improve medical outcomes and reduce anxiety wait time for women ages 25 to 60 who participate in Ireland’s first nationwide cytology-screening program...”

Realities

Market forces will swing the pendulum

- Labor shortages?
 - Aging workforce; insufficient supply of cytotechnologists?
 - Changing lifestyle expectations?
 - More choices for women
 - Cytotechnology program closures
 - Demands for higher quality
- Regardless of the healthcare reform solution, millions of people will be added to the health care system
 - Focus on screening for early disease at cellular level
 - More things to do with same cellular specimen



So What does this mean for us?



From 'grease monkey' to certified mechanic



- Electronic keys that control locks, windows, aircon/heating and ignition
- Hi tech security systems
- On board computers for everything from engine checks to oil changes
- Bluetooth cellphone
- Automated cruise control
- Ambient air/heating controls
- Audio stereo systems—DVDs, radios, tape deck
- GPS

The days of the 'self-made car mechanics' are long gone

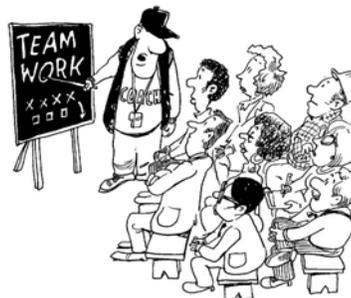
Specially trained and certified engineers



- Specialty training
- Required certifications
- Career path
- Increased compensation
- Increased job security
- Status, recognition and career pride



...and requires that we relearn the principles of teamwork



Effective, safe care requires more than just a pilot



First, we must we play together



What are the implications for your future? GREAT!



Cytotechnologists

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> ▪ Locator skills ▪ Patience ▪ Strict adherence to process ▪ Professionalism ▪ Knowledge ▪ Closer patient connection | + | <ul style="list-style-type: none"> ▪ Pre-analytic and post-analytic quality focus ▪ Efficiency ▪ Teamwork ▪ Curiosity |
|--|---|---|

What are the implications for your future? GREAT!



Cytopathologists

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> ▪ Ability to use knowledge of tissue patterns, new technologies and clinical understanding to enhance all information from study of cells ▪ Medical knowledge ▪ Clinical knowledge ▪ Closer Patient Contact | + | <ul style="list-style-type: none"> ▪ Pre-analytic and post-analytic quality focus ▪ Clinical-Pathologic correlation through conferences, tumor boards, etc ▪ Curiosity ▪ Teamwork |
|--|---|---|

What new tasks should we consider? Make your own list

- "Image experts"
- IHC / FISH / CISH screening—not only of cells but of tissue also, as these become routinely performed on image instruments
- IHC movement from qualitative to quantitative will enhance opportunities for those who specialize in cellular characteristics of normal, atypical, or malignant cells
- Screening of special stains for microorganisms on tissue
- Use of locator skills saves time for pathologists—and Cytotechs are (much) better at it

All things cellular



- Why are circulating tumor cell technology or flow cytometry not considered legitimate tools for Cytology?
- Why do we duplicate body fluid cell analysis in multiple labs?
- Why are we fixated on one fixative or a couple stains?
- Why are molecular methods not part of cytology now?

What models exist?



- Microbiologist (Virologist)
- Cell culture
- DFA
- Shell vials
- PCR

- Some microbiology labs are 60%-70% molecular, but the people who work there are microbiologists



Think outside the box

- Ultrasound / more aggressive activities
- Promotion of CT autopsies and minimal invasive cytology



Be curious and experiment

- Develop some connection to patients
- Understand the impact of your work—you are vital to quality patient care
- Follow interesting cases, understand the outcomes
- Investigate new technologies—assume accountability; don't wait for others to ask



Who is going to drive how health care is actually delivered?



"Medicine has changed before, after all. When it did, government policy played a role. But much of the impetus came from inside the profession. **Doctors helped change other doctors.**"

New York Times Magazine
November 2009

Who is going to drive the how health care is actually delivered?



"...once a treatment enters the mainstream—once we know whether it works in certain situations—**science is largely left behind.** The next questions—when to use it and on which patients—become matters of judgment, not measurement. **The decision is, once again, left to a doctor's informed intuition.**"

New York Times Magazine
November 2009

Who is going to drive the how health care is actually delivered?



"The health care debate of 2009 has had so many moving parts that it has sometimes seemed impossible to follow. The crisis behind the debate, though, is about one thing above all: the scattershot nature of American medicine. The fee-for-service payment system—combined with **our own instincts as patients—encourages ever more testing and treatments. We're not sure which ones make a difference, but we keep on getting them, and costs keep rising.**"

New York Times Magazine
November 2009

Who is going to drive the how health care is actually delivered?



"The economic incentives in health care are still pointing in the other direction. As long as doctors and hospitals are paid for each extra test and treatment, **they will err on the side of more care and not always better care.** No doctor or no single hospital can change that. It requires action by the government."

New York Times Magazine
November 2009

Pathology's Value Proposition

Services to Patients

Pathologists provide direct patient care on diagnostic selection, performance, interpretation, and optimal therapy options for patients and clinicians

Services to Patient Populations

Pathologists assure the quality of lab tests and collect, survey, analyze and use patient population clinical results to guide therapy, best practices and safety for patients and patient populations

Services to Clinicians

Pathologists provide pre- and post- test consultation, diagnostic services, treatment guidance and other clinical information to deliver personalized health care

"Never forget that it is not a pneumonia, but a person who is your patient. Not a typhoid fever, but a typhoid patient"

~ William Withey Gull

Every number is a life.™



Cells are the future focus
You are in a unique position armed with unique skills
Teamwork, not turf wars will expand your opportunities
Optimism is critical to success
Leadership and professionalism
Open-mindedness – have a FRONTIERS vision
Get going now – be proactive, not reactive
You are the only one who will make it happen

Facing the Future of Cytopathology

The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn.

~Alvin Toffler