

# **integrated diagnostics**

**care delivery model in the realm of ACO's**

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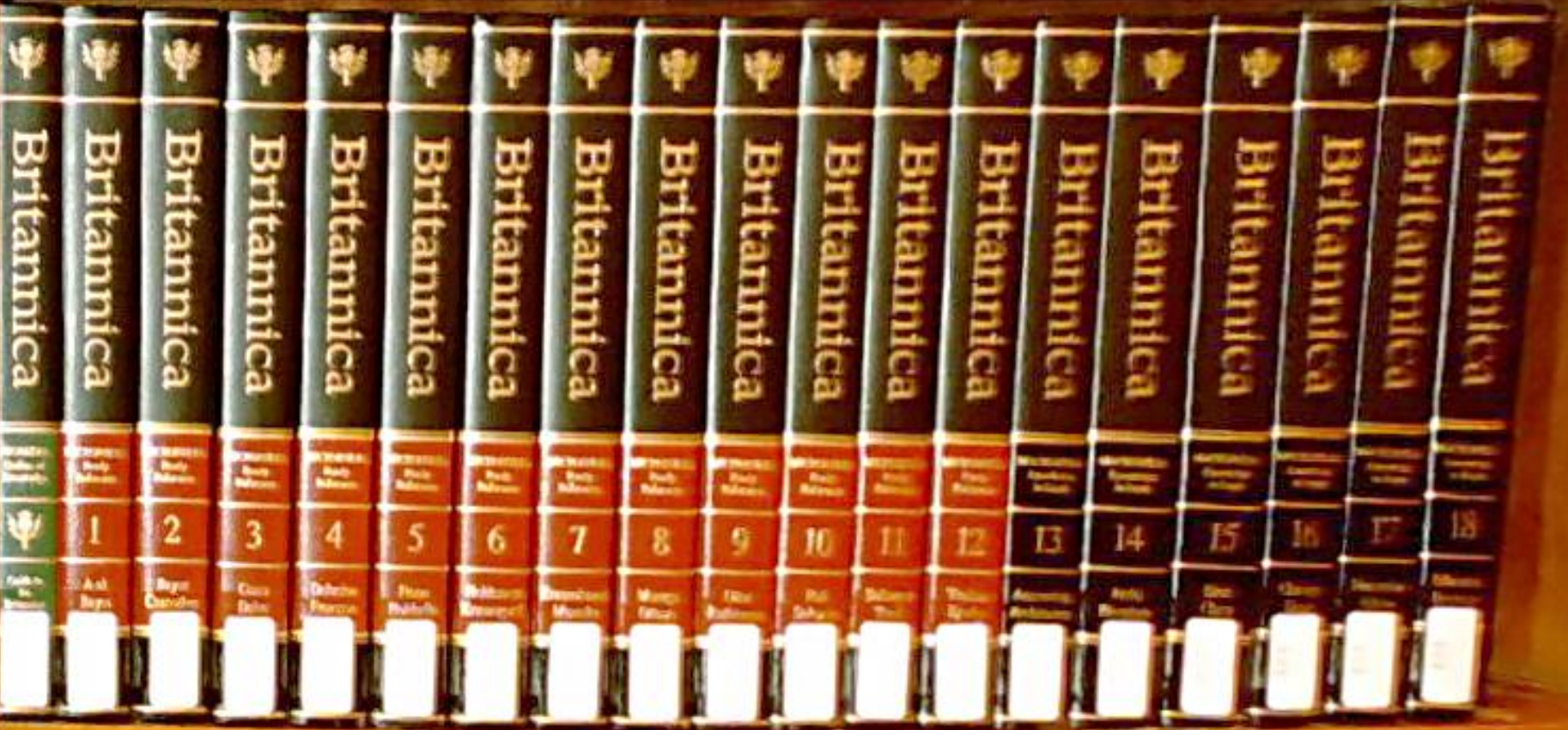
**Executive War College  
New Orleans, April 30, 2013**

**1 disruptive innovation**  
what differentiates it from sustaining innovation?

**2 Integrated diagnostics**  
just how disruptive is it? what trends will it trigger?

**3 relevance to aco's**  
how will the delivery model change? and why?

**what is a**  
**disruptive**  
**innovation?**



**we must use**

**first principles**



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**a low-end  
ultrasound?**

**a high-end**

**stethoscope?**



These innovations were all **disruptive** because:

When they were introduced, their performance was initially much lower than that of the existing technologies...

But, they were able to bring the cost down so dramatically that their adoption became inevitable... sometimes in an alternative market segment (to start with)

Eventually, their performance caught on, and led to their mass dissemination.

now, another type of  
**disruptive**  
innovation

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These innovations were **also disruptive**, but for a different reason:

They were able to “deconstruct” the existing value chain of a business...

They were able to “dis-intermediate” the value chain of a business...

They were able to “re-configure” the value chain with a different set of players.

Their adoption was set off by some “tipping point”

**integrated**  
**diagnostics:**  
**disruptive enough?**

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**our onus is to figure out the pattern**

**that lies hidden underneath the apparent  
chaos on the surface**

*to see through Picasso's outer shell and uncover...*



*the Velazquez that lies behind it.*



© 1999 Bridgeman Art Library, Velázquez, "Las Meninas," 1655



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**space :: pattern**  
**time :: trend**

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**trends**

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**two trends triggered by**  
**disruptive**  
**innovation**

**2** things

**you simply could not do at all before**

**1** things

**you can do at a significantly lower cost**

**to apply the concept  
to integrated diagnostics,  
let us review....**

**... one component at a time**

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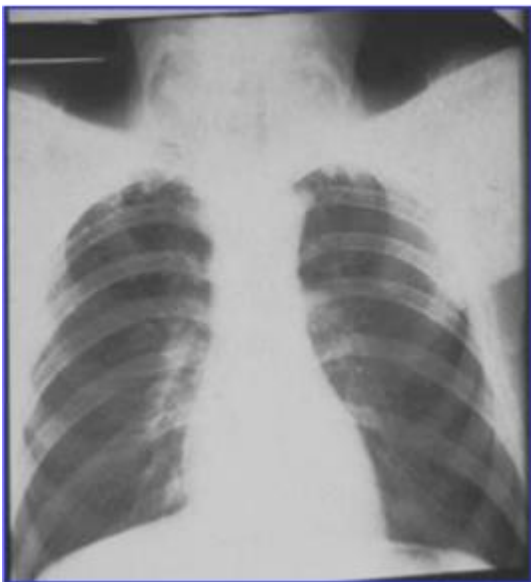
**1 radiology**

**2 anatomical pathology**

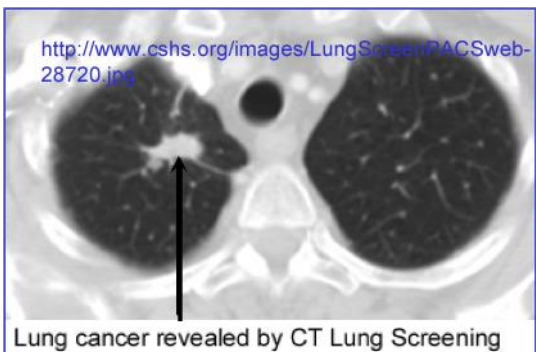
**3 clinical lab**

**transformation in**  
**radiology**  
**over two decades**

ca 1900  
X- Ray



ca 2000  
CT



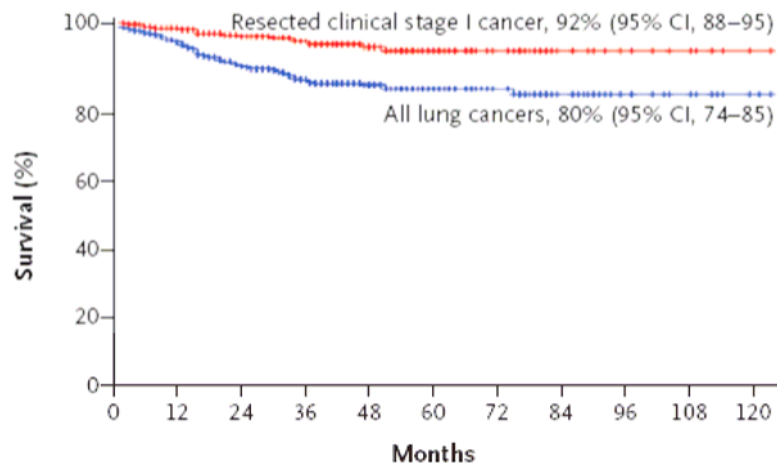
31,567 asymptomatic persons at risk for lung cancer using low-dose CT identified 484 with stage I lung cancer

*The NEW ENGLAND  
JOURNAL of MEDICINE*

ESTABLISHED IN 1812      OCTOBER 26, 2006      VOL. 355 NO. 17

Survival of Patients with Stage I Lung Cancer Detected on CT Screening

The International Early Lung Cancer Action Program Investigators\*



Surgery improved five-year survival



# 20 years of radiology going digital

**2**

**New: 3D Visualization**

**New: Quantitative analysis (Cardiology, Oncology)**

**New: Fusion – anatomy and physiology**

**New: Contextual access to anatomy atlas at POC**

**New: Contextual access to “similar cases” at POC**

**New: Contextual access to expert opinion at POC**

**1**

**Productivity up by 20%**

**Report turn-around time down from 3 days to 3 hours**

**Radiology study availability up from 60% to nearly 100%**

**“Handling errors” down – undocumented**

**Clinician viewing up by a factor of 2**

**Comparison with prior studies up by a factor of 5**

**Screening (breast, lung, colon) up by a factor of 10**

## **2** things

**you simply could not do at all before**

## **1** things

**you can do at a significantly lower cost**

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**2** **redefine**  
standard of care

**1** **automate**  
standard of care

**transformation in**  
**pathology:**  
**impending**

# Potential Clinical Use Cases... inventoried

quantitative comparison      improve report turnaround time

education      case sharing and collaboration      pathology 2.0

tumor boards      archiving and retrieval

improve slide “availability”      remote case review      reporting

consultation and second opinions      efficient primary diagnosis      research and clinical trials

reduce handling errors      data mining for decision support

quantification      CME and proficiency testing      QA

remote frozen sections      image analysis

personalized medicine

companion algorithms      improve slide “availability”

# Potential Clinical Use Cases... organized

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companion algorithms

# Potential Clinical Use Cases... organized

**2**

- Quantitative comparison**
- Case sharing and collaboration**
- Image analysis**
- Remote frozen sections**
- Data mining for decision support**
- Personalized Medicine**

**1**

- Improve report turn-around time**
- Archiving and retrieval**
- Tumor boards**
- Remote case review**
- Efficient primary diagnosis**
- Reduce handling errors**
- Improve slide availability**
- Quantification**

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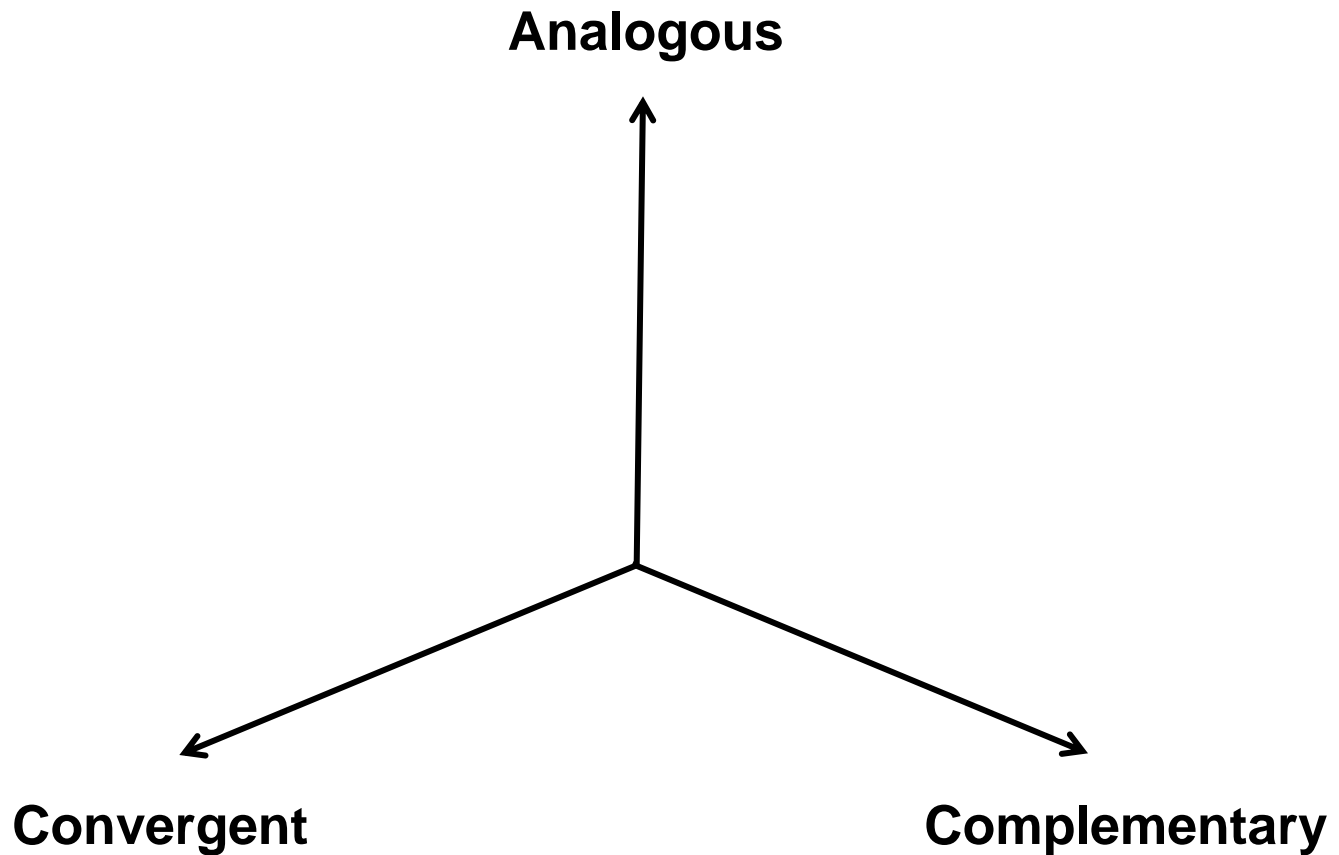
**1** **automate**  
standard of care

**and now...**

**integration**

# Radiology – Pathology Juxtaposition

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# Integrated Diagnostics – WHY?

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**2** **redefine**  
standard of care

**1** **automate**  
standard of care

# Integrated Diagnostics – WHY?

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**2 generate new value**  
diagnostic – prognostic – predictive – prescriptive

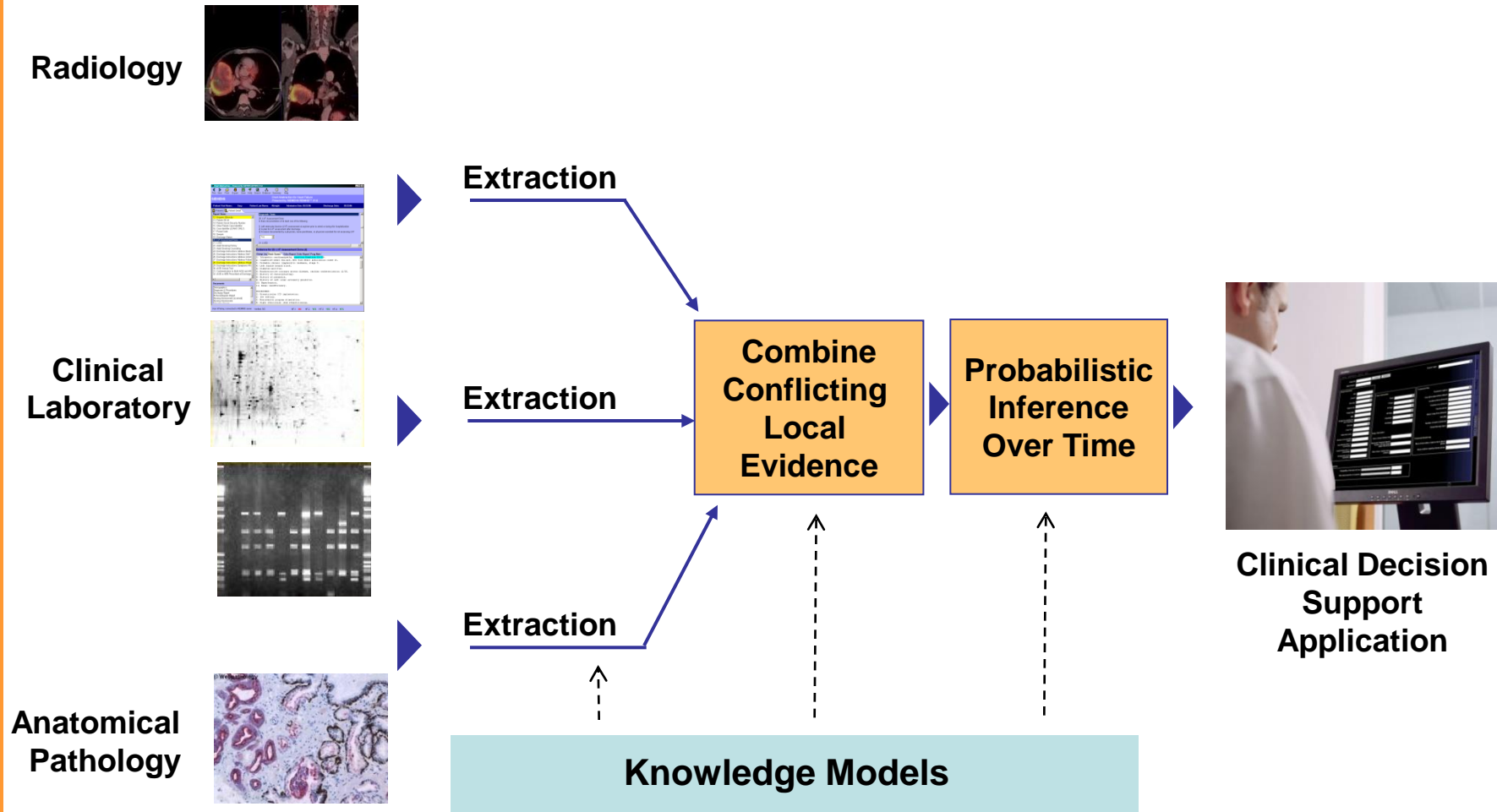
**1 generate efficiency**  
deconstruct – dis-intermediate – reconstruct

# Integrated Diagnostics – HOW?

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- 1. Collection of large databases of patient data and external medical knowledge**
- 2. Creation of knowledge models**
- 3. Application of knowledge models in clinical workflow**

# Integrated Diagnostics: How specifically?



# Our compass for the industry....

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1. ... from acquisition thru image analysis, to decision support to report
2. ... from “off-time” to real-time, from single-modality to multi-modality
3. ... from morphology to molecules (....morphology AND molecules)
4. ... from “information” to “diagnostic confidence”
5. ... to personalized disease stratification and therapy selection

What does that mean?

**“from pathologist to diagnostician”**

**... an INTEGRATOR!**



**finally, what is the**  
**relevance**  
**in the aco realm?**

1

# integration of diagnostic disciplines

**2**

# **disintermediation**

**(and re-integration) of the value chain**

**3**

more granular  
**stratification**  
of therapeutic decisions

4

**efficiency**

**will remain a key driver**

**5**

**education**

**will change dramatically**

**real thing**



**beginning**

**trend**



**innovation**



**integrated diagnostics**

**the beginning of a trend**