



Teleradiology introduction

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Entrepreneurs' agenda



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Teleradiology: Hype Vs Reality

Dr Saji Salam



When EHM carried my article defining Clinical Process Outsourcing, way back in Jan 2003, I never did imagine that CPO would become an industry term or that so many businesses would want to jump into the CPO bandwagon. One of the more hyped about areas in CPO is Teleradiology. Today every presentation on healthcare is peppered with Teleradiology for flavor.

The fact remains that the demand for radiology services in the US market is growing while the supply of radiologists is not growing enough to match the requirements. However, we need to take a step back and examine this from a different perspective which some times is missing when every other person wants to be running a healthcare BPO business these days. My intent is not to discourage the gold seekers, but to play the devil's advocate. This article is meant to be a reality check. I would appreciate critical feedback on this piece.

Can India be a teleradiology hotspot?

Some of the teleradiology centres in Australia and Lebanon have several US board certified radiologists working from those locations. I guess we have a handful of US certified radiologists of Indian origin working from India, which is perfectly within the confines of US regulations. However when a large Indian IT organisation wanted to relocate more radiologists of Indian origin to Bangalore, there were no takers. Is there the right incentive for a radiologist in US to relocate to India today, for professional reasons?

US radiologist vs Indian radiologist debate

Healthcare in US is built on stringent regulations, because healthcare is a politically sensitive issue in the country. The fact is that, though there is a shortage of healthcare professionals in the US, the

Economists' agenda



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The Brookings Trade Forum is an annual conference and volume that addresses issues in international trade and macroeconomics. The 2005 Forum is the eighth in the series. It is co-edited by Susan M. Collins (Brookings and Georgetown University) and Lael Brainard (Brookings).

The 2005 Trade Forum will be held on Thursday and Friday, May 12-13, 2005. The agenda includes papers by Daniel Trefler, James Markusen, Maria Borgia, Desiree van Welsum, Brad Jensen and Lori Kletzer, Rafiq Dossani, Rosemary Batt, T.N. Srinivasan, Clair Brown and Greg Linden, Lael Brainard and Robert Litan, Richard Freeman, and Kimberly Clausing.

This website serves as our primary method for disseminating information about the Brookings Trade Forum. Please bookmark this page, as it is not easily accessible from the Brookings Institution homepage. Refer to the links below for the meeting agenda, special information for authors and other information.

RESOURCES

- [table of contents and papers](#)
- [printable table of contents \(PDF\)](#)

PROJECT CONTACT

- [Lindsey Wilson](#)

Perspective [July 22, 2005](#)

Comment ([September 22, 2005](#)) and Slides by Jeffrey Macher
Discussion

8

ROSEMARY BATT

A Comparison of Service Management and Employment Systems
Among In-house, Outsourced, and Offshore Call Centers [July 2005](#)

Comment by Vivek Agrawal
Discussion

Panel: Technology Offshoring

9A

RAVI ARON

Financial Services [September 26, 2005](#)

9B

ASHISH ARORA

Software Services (with Figures and Tables) [September 15, 2005](#)

9C

FRANK LEVY

Radiology [July 29, 2005](#)

Discussion

Part V: Some Issues For Policy

10

LAEL BRAINARD and ROBERT LITAN

A Fairer Deal For America's Workers In A New Era of Offshoring

[September 14, 2005](#)

Comment and Tables by Lawrence Mishel [September 22, 2005](#)

UEMS radiology & ESR



Have raised the issue since 2003

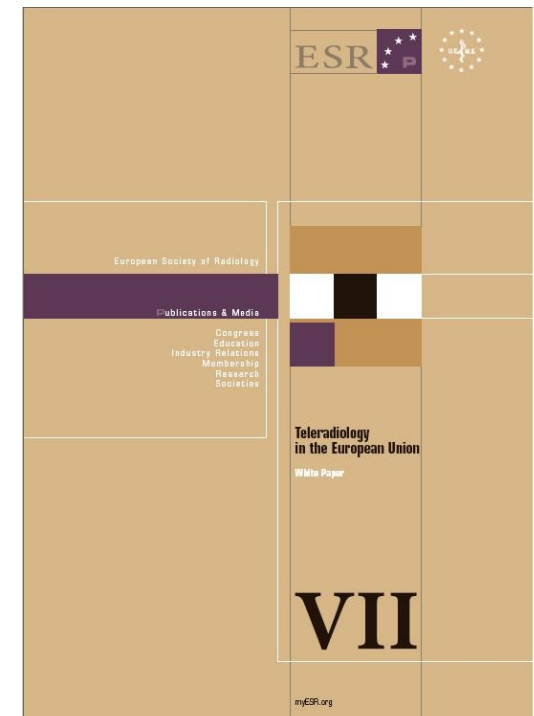
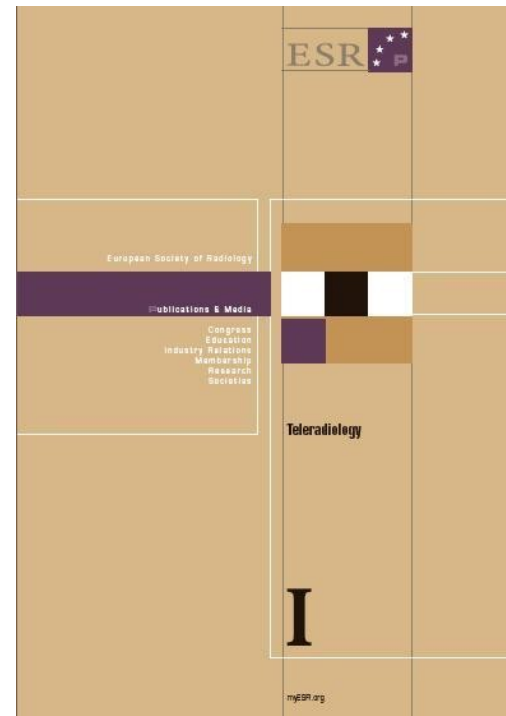
Joint position papers

ESR Brochure-I Teleradiology (November 2004)

ESR Brochure-VII Teleradiology in the European Union – White Paper (November 2006)

www.myesr.org

publications, brochures



Teleradiology



5 W's

- What
 - Why
 - Who
 - When
 - Where
-
- Definition
 - How much
 - Barriers / facilitating factors

Background (1)



Radiology has changed over the last decades

- From hard-copy X-ray films
to
- PACS-based digital files containing imaging data
 - CT, MRI
 - digital mammography
 - digital X-ray examinations
 - ultrasound

This makes it easier to send out radiology examinations out of department
and to view these examinations at other locations

in other rooms within the radiology department
on patient wards of the hospital
outside of the hospital

Background (2)



Increased demand for radiology services

- Ageing population
- Radiology consumption increases efficiency of medical care
- Growth in image intensive CT and MRI

No substantial increase in number of radiologists

As a result

- Growing waiting lists
- Shortage of manpower
- Increased health care spending on radiology

2000-2003 Trends in radiology production

Sanders D, Dutch Society of Radiology. MemoRad 2005; 3:26

<i>2003</i>	<i>Δ exams</i>	<i>Δ income related parameter</i>
	<i>(Sanders' credits,% change relative to 2000)</i>	
CR	+ 3	+ 19
CT	+ 32	+ 57
MRI	+ 55	+ 76
US	+ 21	+ 21
Ang&Int	0	+ 53

What is Teleradiology



definition

Teleradiology is the electronic transmission of radiological patient images, such as x-rays, CTs, and MRIs, from one location to another

- Within the hospital (not seen as teleradiology)
 - Hospital-to-home (viewing from the home while on-call)
 - Night-hawking (sleeping while on-call)
 - Day-hawking (outsourcing to commercial teleradiology firms)
-
- Teleradiology has profoundly changed the business model of radiology
 - has changed the way radiologists practice medicine
 - is potentially disruptive technology

Why Teleradiology



Good reasons:

Raise quality

- Availability of radiology services also in remote areas
- Availability around the clock with fast turn-around times
- Potentially: easily available 2nd opinion from super-expert
- Solution to the shortage of radiologist manpower

Real reasons:

- Economic benefit

In the News

- ◆ **“You know, if hospitals can send radiology exams to India and cut the cost in half and control spiraling health costs, what is wrong with that.”**

**Dan Griswold, Trade Analyst, CATO Institute,
quoted during session on CNN’s Lou Dobbs
Moneyline, Jan. 28, 2004**

Business models



Principle: (textbook example of Ricardo-model of comparative advantage)
Arbitration of differences in per-hour costs of radiologists in low-wage versus high-wage countries

Teleradiology firm is subcontractor of in-house radiology department

- **Teleradiology services provide full authorized report**
- **Teleradiology provides report to be authorized by in-house radiologist**

Win-win-win situation:

In-house radiologists: increased efficiency, higher income (?)

Teleradiologist: New well-paid jobs

Health care system: Lower overall costs

e-Health



European Commission

- **eHealth**, as ICT solutions for patients, medical services and payment institutions can **help deliver better care for less money**;
- “ eHealth, one of the priorities of the EU's i2010 programme to **boost innovation and jobs ...**”
- eHealth, One of the first six lead markets: markets are markets in which EU industry can develop a **global competitive advantage ..**”

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- Radiology Interpretation Service, Anytime, Anywhere.
- Fast Turnaround Time
- Quality Reporting
- 24X7 Coverage
- Safe & Secure
- Reduced Costs



Teleradiology Solutions is a JCAHO accredited company providing remote teleradiology services to hospitals and imaging centers across the globe from US to Singapore to India. We started operations in Feb. 2002 and have offices in the US, the Netherlands, and India.



FOR IMMEDIATE ASSISTANCE, CONTACT: P: 866-207-1975 [Contact Form](#)

Leadership - Curriculum Vitae

Board Certification:
American Board of Radiology (1998)
Certification in Diagnostic Radiology

Fellowships:
The New York Hospital - Cornell Medical Center, NY
Department of Diagnostic Radiology
Section of Ultrasound, CT and MRI (Body)
7/1/1993-6/30/1994

Yale University School of Medicine, New Haven, CT
Department of Diagnostic Radiology
Section of Neuroradiology
7/1/1994-6/30/1995

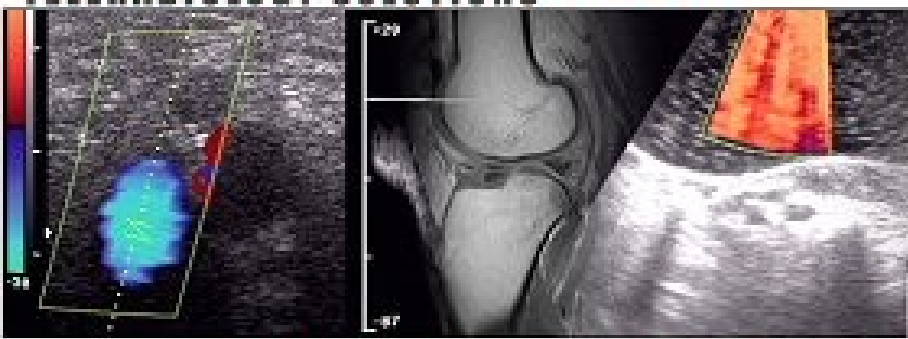
Residency:
Yale New Haven Hospital, New Haven, CT
Department of Diagnostic Radiology
7/1/1995-6/30/1998

Medical Education:



Arjun Kalyanpur, MD

RADIOLOGY EXPERT INDIA
TELERRADIOLOGY SOLUTIONS



Ultrasound & MRI

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Our Services

- Teleradiology Diagnostic Services
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- CT Scan
- PET Scan
- Color Doppler
- Ultrasound

Radiology Expert (Teleradiology Solutions) is a highly respected and trusted medical service provider, offering image interpretation services, teleradiology diagnostic services, diagnostic ultrasound services across various hospitals, imaging centers, physician groups. We are expanding the reach of the e-radiology services through out the globe.



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24x7x365

In the News

- ◆ **"We don't have a comparative advantage in producing clothing, textiles, and that's one of the reasons we've tended to lose textile jobs," Mankiw said. "Maybe we've learned that we don't have a comparative advantage in radiologists."**

Washington Post, Feb. 10, 2004--quote attributed to N. Gregory Mankiw, Ph.D., Chairman of the White House Council of Economic Advisers

Who performs Teleradiology, where



Small teleradiology outfits (who see teleradiology as a sideline activity)

- University-based radiology departments:
 - as a service to regional hospitals (Harvard, Munich, Budapest)
 - to generate additional income

Larger scale, structural teleradiology projects

- Government-funded
- University-based radiology departments:
 - e.g. Denmark – Baltics teleradiology project

Independent commercial teleradiology firms with international footprint

- Europe
 - Eurad Consult (Mechelen, Belgium)
 - European Telemedicine Clinic SL (Barcelona, Spain)
- India
 - Teleradiology Solutions (Bangalore)
- Australia, Lebanon, ...

Potential scale of Teleradiology



Time expenditure in radiology

Average Dutch practice, in time-equivalents

2003

CR	35
CT	23
MRI	16
US	19
A&Int	6

Sanders D, Dutch Society of Radiology. MemoRad 2005; 3:26

Actual scale of Teleradiology



- *Still limited but expanding rapidly*

Eurad Consult	40,000 MRI examinations per year
European Telemedicine Clinic	110,000 examinations (2006 data)
Teleradiology Solutions	8 fte radiologists

(Compare: 1 radiologist reads approx. 10,000 examinations per year)

- **Government-backed outsourcing: UK**
- **Government-backed teleradiology projects (e.g. Denmark-Baltic)**
- **Huge interest of health insurance companies, governments, radiology practices**

Promoting factors



- Strong business model for teleradiology (key driving factor)
 - Market forces will promote teleradiology service providers in low-wage countries
 - at first, also (East European) EU
 - in the end, primarily non-EU countries (India, China!)
 - National health care systems will become (slightly) cheaper
 - In-house radiologists will likely benefit
- Good IT infrastructure available
- Good acceptance by doctors and patients (they do not seem to mind or are unaware of the issue)

Potential barriers



- Technological issues (minor)
- Privacy issues (needs legal framework)
- Supplier-side
 - Training of adequate number of radiologists
(who are then also willing to do this (2nd rate?) work)
- Demand-side
 - Legal uncertainty: responsibility & accountability
 - Concerns about medical quality: isolation from clinical context
 - Concerns about reimbursement

Responsibility & Accountability



- Teleradiology providers often outside of EU
- Commercial firms, subject to that country's particular law system

- Protection of patients' rights within EU
- To safeguard legal certainty for patients:
- Teleradiology should be subject to EU law

Isolation from clinical context



- Teleradiology services are remote
- Have limited access to patient files, current and historic lab data, imaging studies
- No face-to-face conferencing with treating doctors

Legal concern

Many EU countries require by law that all available information should be used when interpreting radiology examinations, to ensure optimal quality of care

Lindenbergh SD, et al. Tijdsch Gezondheidsrecht [J Health Law] 2008, in press

Medical concern

The interpretation of an imaging study will change according to this additional information (the clinical context)

This will result in overcautious, or vague reporting: “defensive medicine”

Calling for extra unnecessary/inappropriate tests, driving up costs and waiting lists

Clinical context (1)



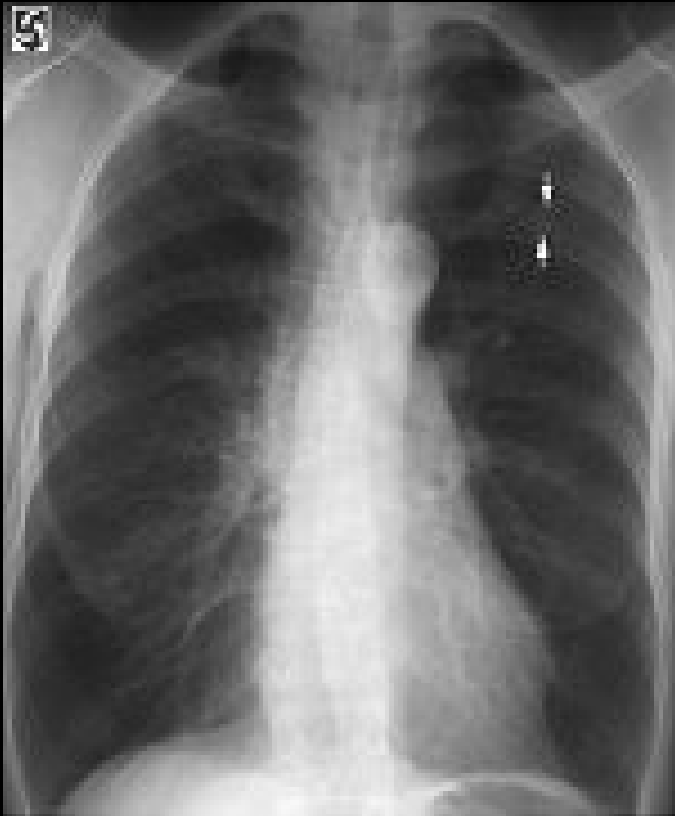
- Metastasis of cancer !

Clinical context (1)



- Lab:
Alk. Phosph. = 216 IU / l
- Metabolic disease (Paget) !

Clinical context (2)



- Lung cancer !

Clinical context (2)



- CT of 5 years prior: Unchanged
- Irrelevant, benign nodule !



Reimbursement issues



Problem:

Historically: the “radiology report” is radiologists’ end-of-the-line product

But radiology service also entails clinical services, that in fact occupy most of radiologists’ working time

When using outsourcing, the “radiology report” is not any more the appropriate unit of radiologists’ productivity

radiologists' working time



Estimate: Film interpretation and reporting: 30% of time expenditure

Other patient-related activities: 70%

- ✓ Organizing workflow in department
- ✓ Consultancy (beeper frequency!)
- ✓ Justification of examination in individual patient
- ✓ Optimizing, tailoring individual examination
- ✓ Ad-hoc problem solving whenever they arrive:
proximity / accountability / responsibility
- ✓ Conferencing in multidisciplinary teams
- ✓ Optimizing fast, efficient diagnostic work-up for patient
- ✓ Diagnostic impact, therapeutic impact
- ✓ Quality control

Responsibility & Accountability



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We propose :

Regulation of teleradiology should be the responsibility of the EU member state where the patient undergoes imaging

Isolation from clinical context



The solution:

- The teleradiology report should be embedded within existing clinical practice
- The radiologist who
 - consults with the referring doctor
 - selects what imaging study to perform
 - is responsible for in-house quality standards
 - who performs the imaging studyshould also be the one who:
 - discusses the implications of pertinent findings with the referring doctor

Thus:

Teleradiology should be organized as a service between radiologists sending out the images and radiologists providing the teleradiology service

Reimbursement issues



Potential solutions

1. The other radiological “clinical services” are made visible and will be separately reimbursed

Or, perhaps more feasible

8. Radiologists directly negotiate with teleradiology firms as their subcontractors and pay for teleradiology services out of their own budget