

- 1) International Lung Sounds Association
Historical Perspectives
- 2) GREETINGS
I am pleased to have this opportunity to speak with this distinguished group
And I hope you all enjoy and learn a lot at this meeting.
- 3) Comment
As one of the founders of ILSA I am also pleased to be part of something that has helped to improve lung sound analysis.
- 4) I shall begin by saying how I got involved in lung sound analysis. I was studying pipecoverers exposed to asbestos and when I did physical examinations on them I heard rales as they were called then (They are now called crackles).
- 5) The work was part of a doctoral thesis I was doing at the Harvard School of Public Health. I showed that the workers with crackles were more likely to have other signs of asbestosis, such as abnormal x-ray findings, decreased vital capacities and abnormal respiratory symptoms as compared to those without crackles and that these findings were related to the duration of their exposure to asbestos. My mentor, a Public Health Physician, questioned the validity of my observations and asked, “ How do we know that the crackles are not between your ears?”
- 6) After the thesis was done I got a job in the emergency room of the Massachusetts General Hospital seeing patients 2.7 miles away at the Logan Airport via two-way closed circuit television. This project, an early venture into Telemedicine started by Dr. Kenneth Bird, attracted many engineers from the Massachusetts Institute of Technology. They were interested in the technology used in evaluating patients at a distance. I told one of them about my crackle observations and he said “ If you can hear them we can show them to you.”
- 7) I borrowed a tape recorder from the HSPH and an electronic stethoscope from the MGH and got on a bus to Maine where I recorded the lung sounds of the workers exposed to asbestos.
- 8) I took them to a lab at MIT. This lab had a very large computer. Curiously there was a program in this computer that had been developed to study carotid sounds in the hope of detecting signs that would be helpful in identifying patients at risk of developing strokes. Fortuitously, the program had acoustic analysis in the time expanded mode. This was the equivalent of playing tape-recorded sounds back at a slow speed. The plots of the sound are expanded allowing the patterns of such things as wheezes and rhonchi to be visually distinguished from crackles and normal sound waveforms. I was particularly pleased when I saw that pleural friction rubs were different than all the other sound patterns. I believed that we had come upon something important.
- 9) The MIT engineers were unimpressed and said that they did time expanded waveform analysis and asked, “ What is the big deal?” Somewhat later Dr. David Cugell, Professor of Pulmonary Medicine at the University of Illinois published a paper in which he said that time expanded plots were the first things to show that lung sounds could be distinguished from one another visually. This was patented.

10) The circumstances that led to the formation of the International Lung Sounds Association began one day at a meeting of the American Thoracic Society. I had been

interested in occupational asthma and gave a talk on the subject. I was puzzled by the definition of atopy. It is important in the industrial setting to know whether a worker is wheezing because of the occupational exposure or because he or she is genetically susceptible to develop asthma because of atopy. I commented that the situation reminded me of the story about the Little Prince by Antoine de Saint-Exupery. The little prince came to earth from the planet B612. He asked a man to draw him a picture of a sheep. The man drew several that the little prince didn't like. Finally the man drew a picture of a box and said to the prince "Your sheep is inside." The prince said, "That's exactly what I wanted. Will he get enough to eat?" (Although I knew what atopy was none of the definitions suited me.)

11) Dr. Robert Loudon, Professor of Pulmonary Medicine at the University of Cincinnati, was in the audience and came up to talk with me. Robin was interested in quantifying cough. He had placed a tape recorder in the room where medical grand rounds were held at the University of Cincinnati and recorded coughs at the weekly Grand rounds over a long period of time. He counted the number of coughs at each session and showed that the counts correlated with the air pollution levels in Cincinnati. He said he was fascinated by a talk that incorporated the Little Prince into a medical lecture. I was also interested in his work. We talked for over an hour.

12) We talked about quantification of acoustics in medicine. Who did we know that had an interest in the subject?

13) After the meeting we contacted a number of physicians and engineers we knew and had the first meeting in Boston at the Faulkner Hospital in 1976.

14) Stated Objectives (1)

- "To provide an opportunity for exchange of ideas and experiences among those who have an active interest in the subject".
- "Clinicians, physiologists, engineers and perceptual psychologists can each contribute to a better understanding of what lung sounds mean".
- "We hope that comparisons of methods of recording, analyzing and describing lung sounds will reduce ambiguity".

15) Stated Objectives(2)

- "We hope that discussions about work in progress may prevent unnecessary duplication of effort".
- "We hope that investigators will save time and avoid some mistakes by observing what others have done".

17)

•We were fortunate to have many distinguished experts attend the early meetings including:

- Jere Mead
- Ed Gaensler
- Roger Mitchell
- Shoji Kudoh
- Richiro Mikami
- Paul Forgacs
- Jeff Fredberg
- Forbes Dewey
- Peter Macklem

18) Features of the meetings

- Interdisciplinary nature of the work presented
- The international audience
The large proportion of time devoted to discussion
- Standardization of lung sound nomenclature
- Multiple publications that document the clinical value of computerized lung sound analysis.
Devices are now on the market to provide computerized lung sound analysis.

29)

ILSA MEETING SUMMARY

- There have been meetings in 14 Countries.
 - Over 800 Authors have contributed.
 - Over 900 Abstracts have been presented.
- This is meeting number 38. The 39th is planned for Boston in 2014.

What has happened at these meetings and why have we had so many?

To some lung sounds are not important. I found the following in a text:

“When it comes to diagnosis of chest diseases, the stethoscope is an entirely useless instrument. Nevertheless it does play an important role. Apprehensive patients feel reassured when they feel the chest piece on their pectoral muscles.”

Rubin and Rubin Textbook of Chest Medicine 1960.

Dr Harrington, the former dean of Tufts Medical School, also seemed to not think that lung sounds are not an important subject. I was given an award for teaching Tufts medical students for 25 years. Dean Harrington introduced me saying that I had an ARCANÉ interest in lung sounds, but (perhaps to make up for it) he said I was a very good clinician.

23) I had to go to the dictionary to look up the word arcane. It defined it as known or understood only by those having special, secret knowledge.

24) Why should anyone be interested in lung sounds?

In my opinion there are many reasons.

- 1) All living human beings have lung sounds.
- 2) Lung sounds frequently change when disease is present.
- 3) These changes can help clinicians know that disease is present and often what disease it is.
- 4) Lung sounds can help monitor the course of a variety of illnesses.
- 5) 24) The stethoscope has been in use for 200 years because it can provide clinicians with important clinical information. It is so commonly used by physicians that it has become a symbol of the profession.
- 6) 25) Computers have greatly improved the efficiency and accuracy of getting diagnostic and monitoring acoustic information from patients. Computers circumvent the observer variability that can be a problem with clinicians use of the stethoscope.
- 7) Computers will not be uninvented
- 8) Computers have improved greatly in the past few decades and they continue to improve. (As I mentioned the first computer I used was very large-about 15 feet from front to back. A pocket pc now can do more things than this computer.)
- 9) Computers have become less expensive.
- 10) Acoustic sensors are not very expensive
- 11) Computerized acoustic analysis can reduce radiation exposure (This is particularly important in the case of pregnant women and children).
- 12) The information obtained by computer can be telemetered. This can be of great benefit to patients in remote areas of the world.

The work of ILSA must go on.

Major advances have been made.

Patented technology is already out there that helps diagnose and monitor diseases.

ILSA can remain a forum for international collaboration.

- The 39 International Lung Sounds Association Meeting will be held in Boston at Steward St. Elizabeth's Medical Center in Boston, Massachusetts, Affiliate of Tufts Medical School on October 10th and 11th. Dr. Sadamu Ishikawa will be the host. We hope to see you there

**WHY BE INTERESTED IN LUNG SOUNDS????
BECAUSE THEY CAN HELP SAVE LIVES**

LIST OF ILSA CONFERENCES

No.	Date	Place	Local Organizer(s)
1.	October, 1976	Boston, MA	Raymond L.H. Murphy
2.	September, 1977	Cincinnati, OH	Robert Loudon
3.	September, 1978	New Orleans, LA	William Waring
4.	September, 1979	Chicago, IL	David Cugell
5.	September, 1980	London, England	Leslie Capel & Paul Forgacs
6.	October, 1981	Boston, MA	Raymond L.H. Murphy
7.	October, 1982	Martinez, CA	Peter Krumpe
8.	September, 1983	Baltimore, MD	Wilmot Ball
9.	September, 1984	Cincinnati, OH	Robert Loudon
10.	September, 1985	Tokyo, Japan	Riichiro Mikami
11.	September, 1986	Lexington, KY	Steve S. Kraman
12.	September, 1987	Paris, France	Gerard Charbonneau
13.	September, 1988	Chicago, IL	David Cugell
14.	September, 1989	Winnipeg, Canada	Hans Pasterkamp
15.	October, 1990	New Orleans, LA	David Rice
16.	September, 1991	Veruno, Italy	Filiberto Dalmaso
17.	August, 1992	Helsinki, Finland	Anssi Sovijarvi
18.	August, 1993	Alberta, Canada	Raphael Beck
19.	September, 1994	Haifa, Israel	Noam Gavriely
20.	October, 1995	Long Beach, CA	Christopher Druzgalski
21.	September, 1996	Chester, England	John Earis
22.	October, 1997	Tokyo, Japan	Masahi Mori

23.	October, 1998	Boston, MA	Sadamu Ishikawa
24.	October, 1999	Marburg, Germany	Peter von Wichert
25.	September, 2000	Chicago, IL	David Cugell
26.	September, 2001	Berlin, Germany	Hans Pasterkamp
27.	September, 2002	Helsinki, Stockholm	Anssi Sovijarvi
28.	September, 2003	Cancun, Mexico	Sonia Charleston, Ramon Gonzales,
Camerena			
29.	September, 2004 Earis	Glasgow, Scotland	& Tomas Aljama Corrales Ken Anderson & John
30.	September, 2005	Boston/Cambridge, MA	Raymond L.H. Murphy
31.	September, 2006	Halkidiki, Greece	Leontios Hadjileontiadis
32.	November, 2007	Tokyo, Japan	Shoji Kudoh
33.	October, 2008	Boston, MA	Sadamu Ishikawa & Raymond L.H. Murphy,Jr.
34.	September, 2009	Haifa, Israel	Noam Gavriely
35.	October 2010	Toledo, Ohio	Dan Olson