

METTE PEDERSEN

# Cost action 2103, advanced voice function assessment.

Conference in Crete  
26<sup>th</sup>-27<sup>th</sup> April 2007

# Cost action 2103

## Work group 5

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# Workgroup 5

- **1. Coordination of actions in the Signatory countries (15 in EU) for raising public concern about evidence based voice disorders and quality of life.**
- **2. Provision of feedback of these new aspects to policy makers (and social services, legislators and others).**

A directive has been suggested in the European Union dividing voice laboratories in three categories with defined functions:

- ***1. standard equipped laboratories,***
- ***2. optimally equipped clinical laboratories***
- ***3. research laboratories, with adequate public funding.***

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**Standard equipment:**

- Recording procedure: Audio file/digital recording
- Fundamental frequency with jitter
- Intensity with shimmer
- Spectral analysis (FFT, spectrography, LTAS, power spectrum)

**Optimal equipment also:**

- Recording procedure: digital recording
- Phonetograms for speech, singing and shouting
- Phonation index, diplophonia, multiphonia
- (Irregularity index), voice breaks
- Simultaneous video- and sound recording (for analysis)
- Signal-to-noise ratio & signal-to-harmonics ratio, nasality

**Research equipment also:**

- Stroboscopy combined with glottography
- Averaging of phonetograms
- Speech profile measurements
- Voice efficiency measurements in running speech (SPEAD)
- and others

# Physiological Area

- **Standard equipment:**
- Stroboscopy
- Airflow measurements (Phonation time)
  
- **Optimal equipment also:**
- Electroglottography
- Respiratory measurements (long & short time)
- Air pressure and MFR
- Electromyography
- Articulographic measurements (three-dimensional magnetic sensor)
- Videokymography
  
- **Research equipment also:**
- Highspeed video films
- Videostrobolaryngoscopy with quantitative computing
- Instrumentation for brain flow- and other brain activity measurements
- Ultrasounds scanning, possibility of genetic studies
- and others

# Perceptual and Psychological Area

- **Standard methods:**
- Listening *standard* voice quality test (GRBAS test?)  
(Including nasality)
- Standardized methods for registration of patients' subjective statements of illness  
(VHI)
  
- **Optimal methods also:**
- Objective speech acoustics related perception (Eyscholt)
- Objective musical acoustics related perception
- Video- and acoustic recording of speech and voice behavior (e.g. by stuttering)
  
- **Research methods also:**
- Objective registrations of moods at the physiological and acoustic level
- In coordination with brain function research

- The studies in the literature of the most frequent diagnoses of pathology in the larynx were evaluated in 2 systematic Cochrane reviews.



## The first review focuses on surgical versus non-surgical treatment of vocal fold nodules. (reference 1)

- Using the methods of the Cochrane collaboration there is no evidence documenting the effects of neither surgical removal of vocal nodules nor speech therapy. There is a lack of prospective randomized studies with adequate control groups and follow-up.
- **No evidence was found of voice tests and objective acoustic measures.**

## The second review focuses on acid reflux treatment for hoarseness. (reference 2)

- Even if a few studies were found with the correct research model the critics and reason for non-acceptance by the Cochrane collaboration was that the amount of patients in the different groups was too small, this means that the power of the studies was insufficient.
- **No evidence was found of voice tests, scores or objective measures.**

# The references

- This kind of research is very expensive.
- REF 1. Pedersen M, McGlashan J (2000, update 2007) Surgical versus non-surgical interventions for vocal cord nodules: The Cochrane Library, Issue 1, 2004. Chichester, UK: John Wiley & Sons, Ltd.
- REF.2 Hopkins C, Yousaf U, Pedersen M (2006) Acid reflux treatment for hoarseness; 25 January 2006 in Issue 1, The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

# Ongoing research in Lab

## ○ Mette Pedersen

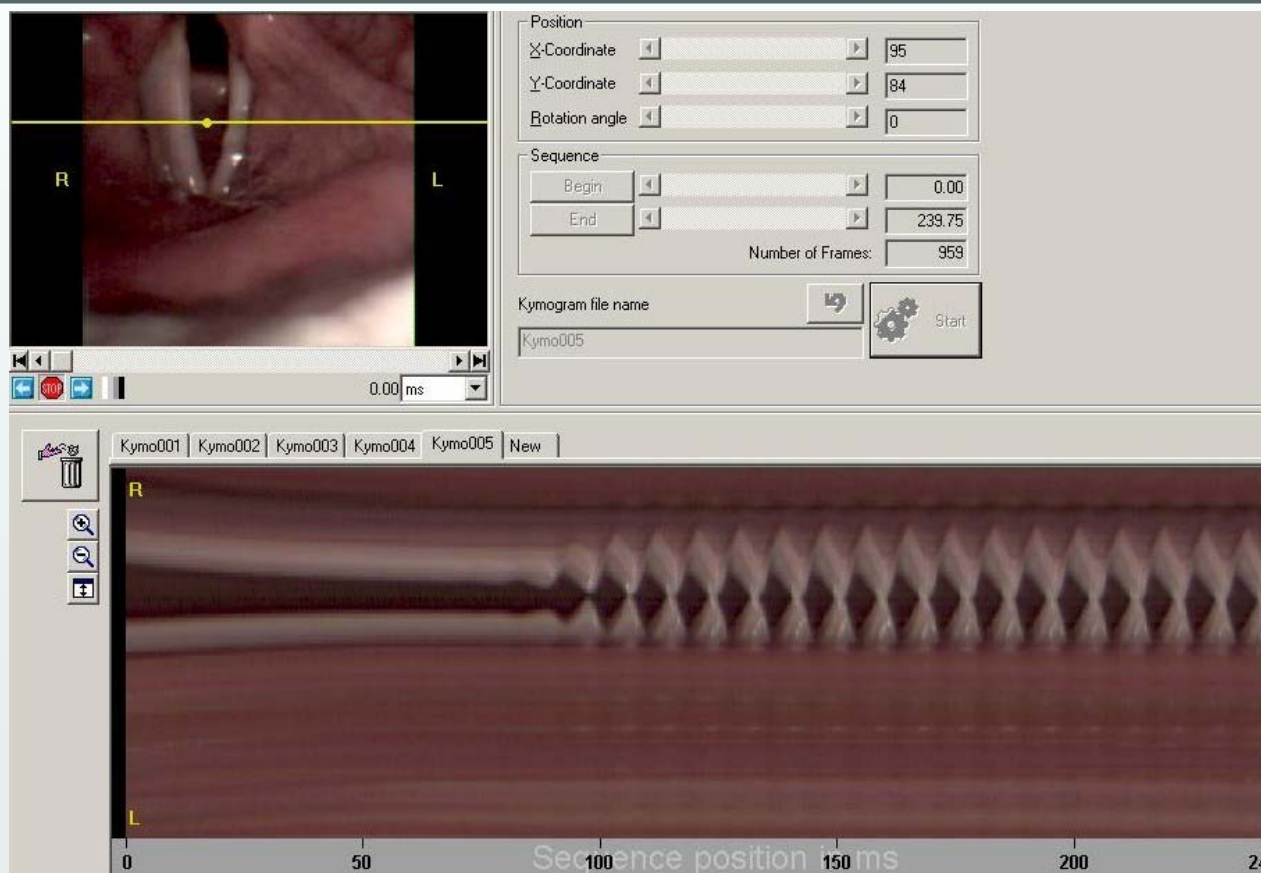
- Daniel Heine Feddersen
- Rune Frederik Hagen Sterling
- Shazleen Rajan
- Roma Yousaf
- Anders Overgård Jønsson
- Christian Frederik Larsen
- Lennart Bo Naurholm
- Aja Guldhammer Henderson
- Joachim Fisker

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# High-Speed Video



# High-Speed Kymography



# Closure state



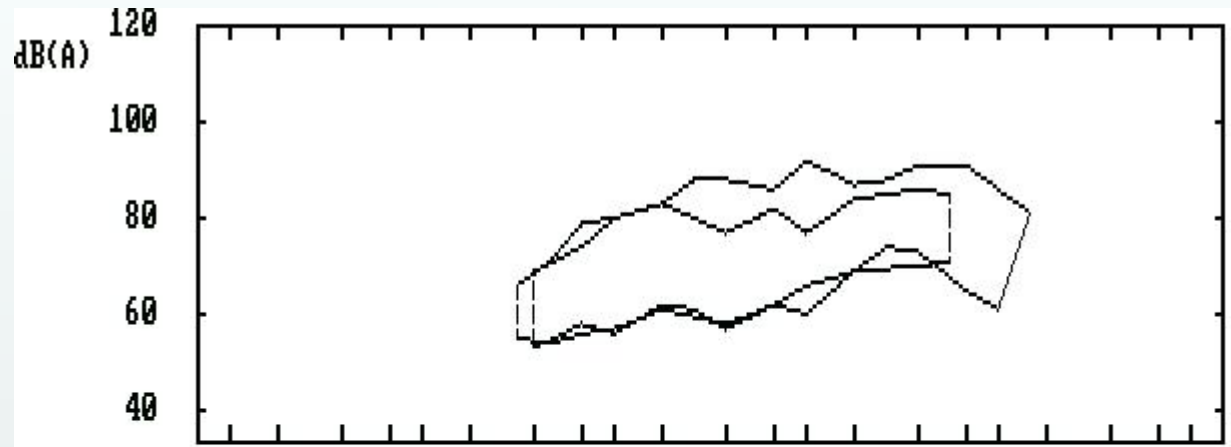








# Phonetography – 2 compared

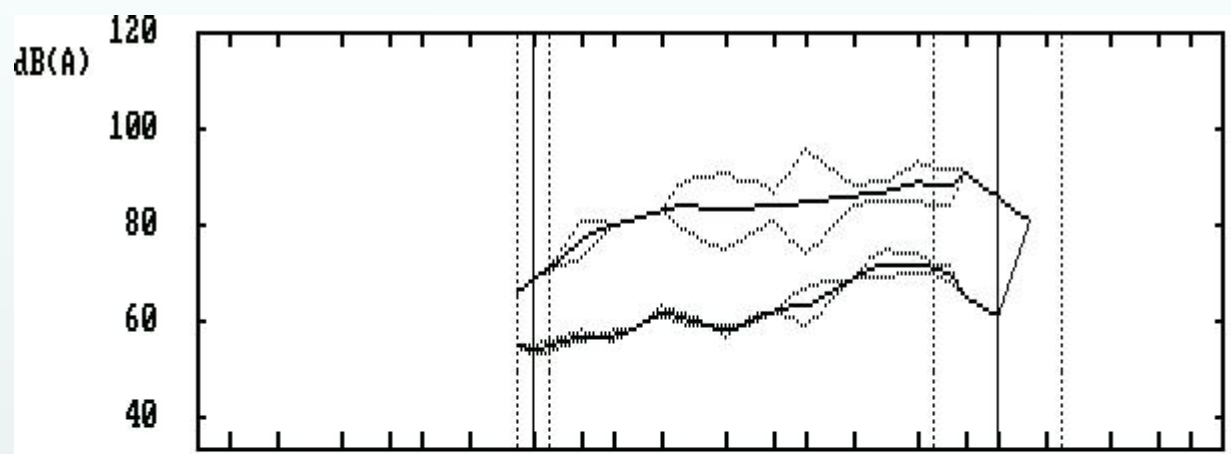


Tone No.	1					2					3					4					5					6												
Tone	G	A	H	C	D	E	F	G	A	H	c	d	e	f	g	a	h	c	d	e	f	g	a	h	c	d	e	f	g	a	h	c	d	e	f	g	a	h
	1	1	1								1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3

- 1. Save recording on disk.
- 2. Print recording as chart.
- 3. Print recording in table.
- X. Return to main menu.
- Select function.

Name -----  
 Area                   0575 dB x semitones  
 Dynamic range       0021 dB  
 Lowest tone d# = 166 Hz  
 Highest tone #2 = 900 Hz  
 Identification       A:030255.02

# Phonetography - Average



Tone No.	1					2					3					4					5					6							
Tone	G	A	HC	D	EF	G	A	Hc	d	ef	g	a	hc	d	ef	g	a	hc	d	ef	g	a	hc	d	ef	g	a	hc	d	ef	g	a	h
	1	1	1								1	1	11	1	1	12	2	22	2	2	2	2	23	3	33	3	3	3	3	3			

- 1. Print statistics as chart.
  - 2. Print statistics in table.
  - 3. Enter headings for chart and table.
  - X. Return to main menu.
- |               |      |     |     |                |
|---------------|------|-----|-----|----------------|
| Average       | 0593 | + - | 116 | dB x semitones |
| Dynamic range | 27   | + - | 06  | dB             |

Select function : \_

# Database

Første undersøgelse **Anden undersøgelse** Tredje undersøgelse

- My throat does notfunction  Har denne
- Globulus  Har denne
- Hoarseness  Har denne
- Mucus og need to clear throat  Har denne
- Larynx spasms og hick ups  Har denne
- Pain eller burning sensation in the throat  Har denne
- Dysphagia  Har denne
- Continuous dry cough  Har denne
- Voice analysis  Har denne
- Ary region

### Tale

jitter%tale1	12,54
shimmer%tale1	17,92
Qx%tale1	49,92
Fx% irregularity tale1	18,89
Qx% irregularity tale1	53,24

### SPEAD

### Tone

jitter%tone1	0,31
shimmer%tone1	5,68
Qx%tone1	47,83
Fx% irregularity tone1	0,15
Qx% irregularity tone1	10,57

Misc undersoegelse 1  
roxitromysin-metronidazol+clarinase

Laryngoscopy Photo



Nexium 40mg 1 gange dagligt +LifestyleGuidance

Behandlingstype

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# Ary Regions 1-5

from left to right

