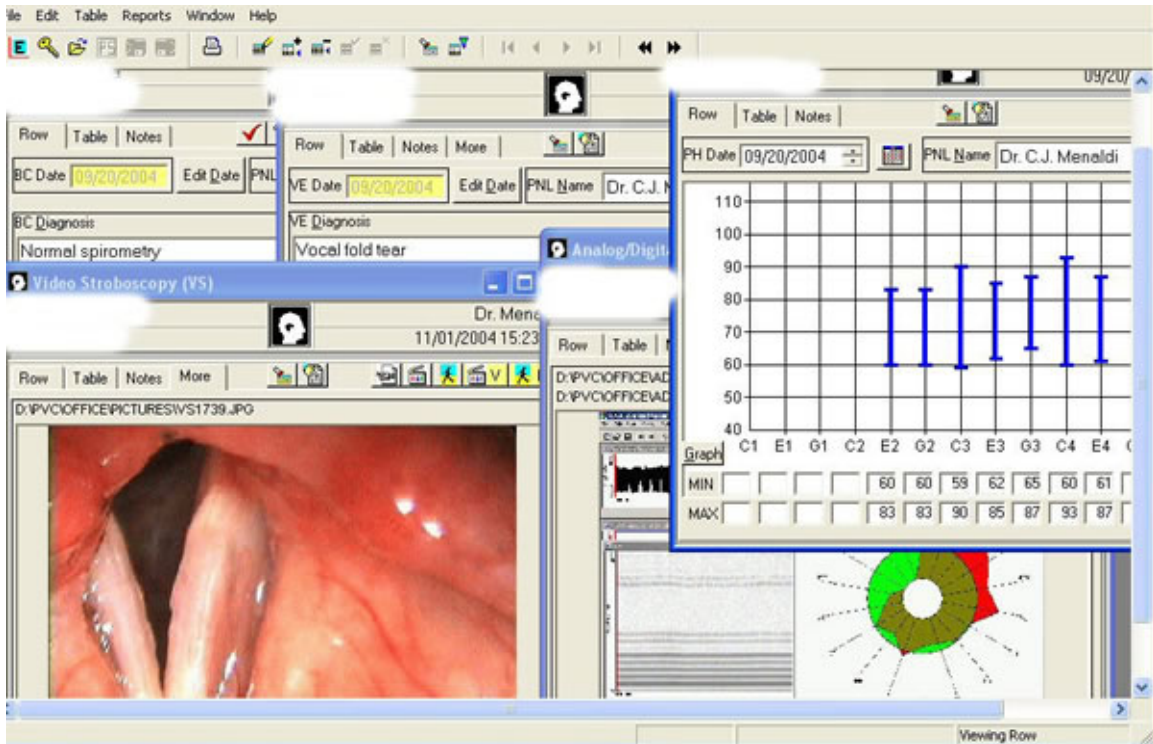


The Voice Laboratory

At Lakeshore Professional Voice Center we have an expert voice team and the latest technology to obtain detailed objective and perceptual analysis of the voice. We use stroboscovideoscopy to image the vocal folds and evaluate their fine structure, as well as computerized voice analysis and aerodynamic studies to help us identify any factors contributing to your vocal problems.



PVC data base developed for our voice center which generated reports of each patient.

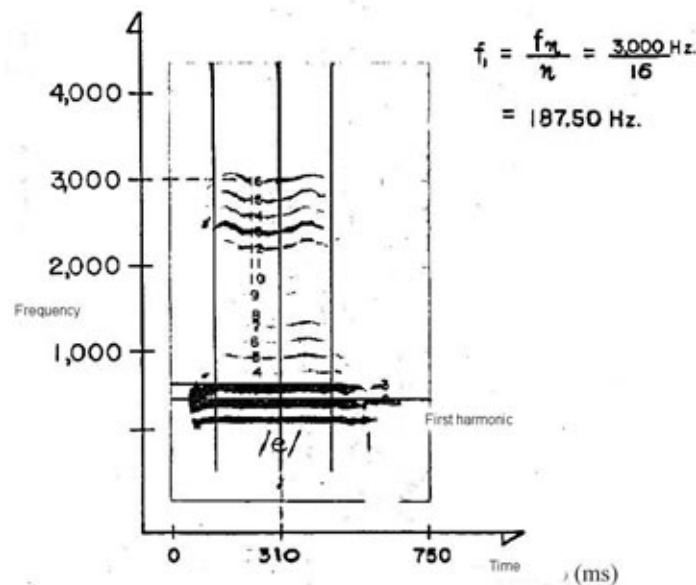
Acoustic analysis

Computerized acoustic analysis of the digitally recorded voice measures the severity of a voice disorder and represents a patient’s “voice print.” It provides a quantitative analysis of the multidimensional physical characteristics of the voice signal before and after voice therapy or surgery.

Some parameters tested include:

- Fundamental frequency

The lowest frequency (first harmonic) of a period signal. In speech, the fundamental frequency refers to the first harmonic of the voice.

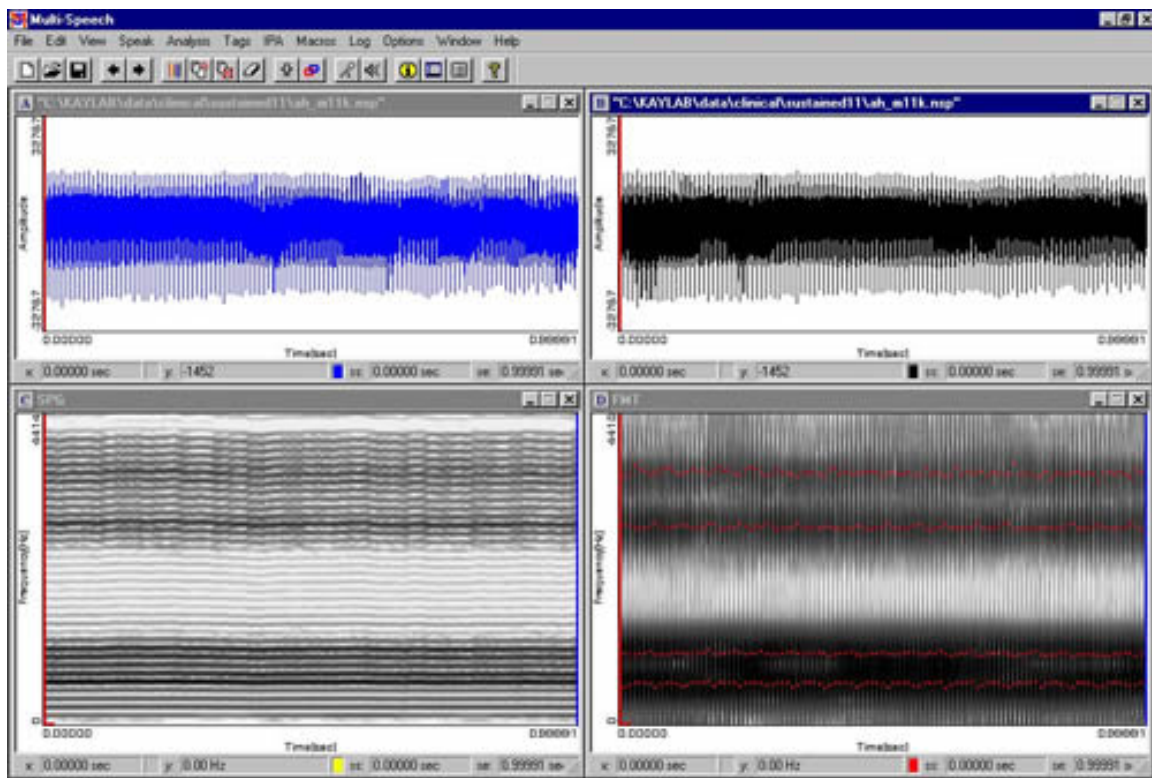


- [Signal-to-noise ratio](#)

Signal-to-noise ratio is the amount of extraneous “noise” in one’s voice

- [Spectral analysis](#)

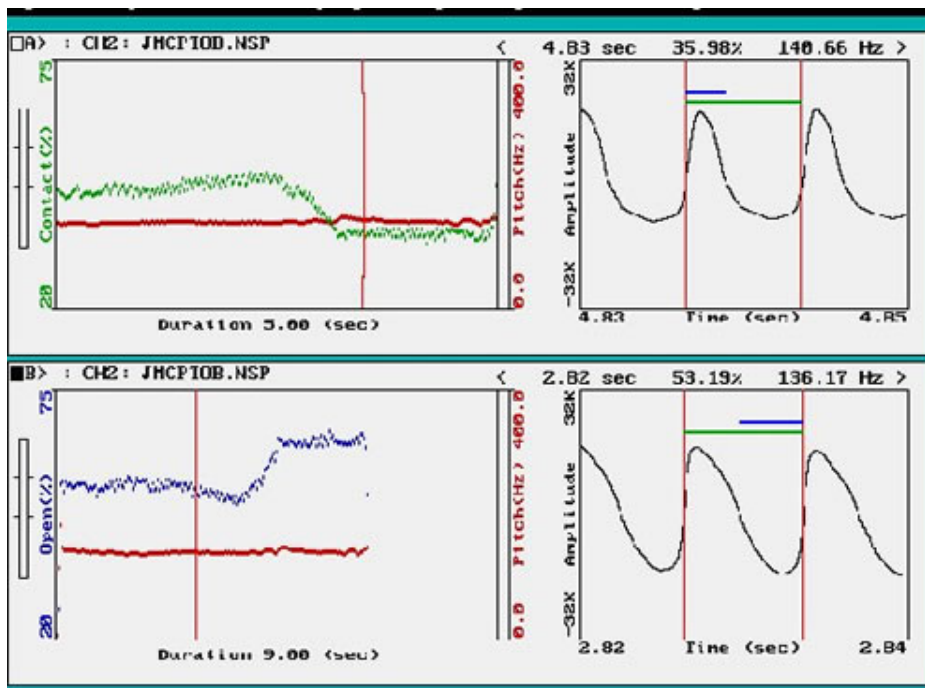
Spectral analysis is the harmonic frequency distribution of voice production.



Spectrogram Analysis: a pattern for sound analysis containing information on intensity, frequency and time. Narrow band analysis is to increase frequency resolution, as in the analysis of harmonics of the voice. Wide band analysis is preferred to reveal formant pattern and pulse vibration.

Electroglottography (EGG)

EGG is a noninvasive technique which measures vocal fold contact area using surface electrodes placed on the neck. During phonation, an electrical signal is passed across the electrodes, and a specific waveform is generated. Abnormal findings on EGG in a larynx that appears normal on endoscopic exam may alert the otolaryngologist and voice pathologist of underlying pathology.



Laryngograph (top) and output graph (bottom)

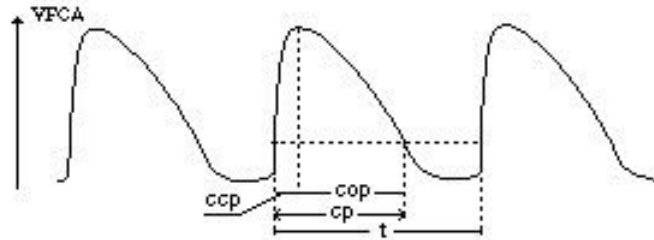
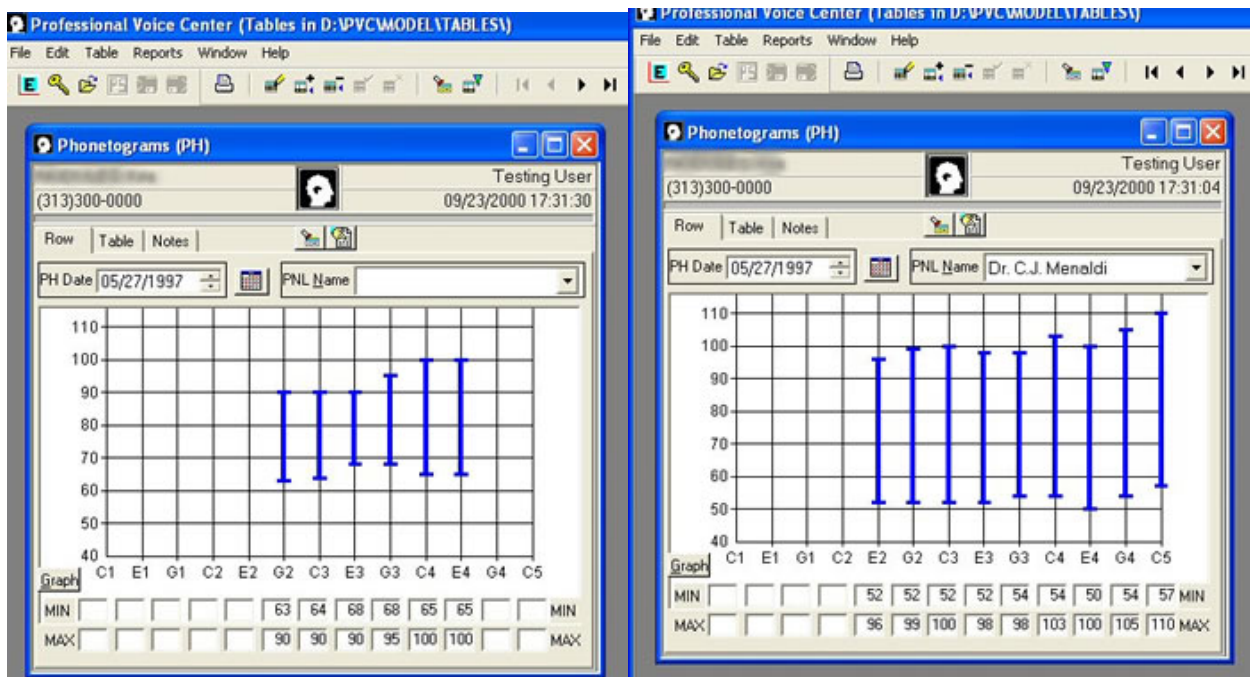


Image of the EGG: VFCA means Vocal Fold Contact Area, cp is the contact phase (closed period of the vocal fold), t is the period of one cycle of vocal fold vibration is the closing phase, cop is the opening phase.

Phonotogram (Voice Range)

The voice range profile (or phonotogram) demonstrates, in graphic form, the range of frequencies and intensity with which a speaker can phonate.



Phonotogram: before (left) and after (right) voice therapy

Aerodynamics Studies

Breathing is critical to the support of the voice. Breathing problems, such as asthma, may contribute to voice difficulties. We perform pulmonary function tests to assess each patient's breathing capability as part of our voice evaluation.

Stroboscovideoscopy

Videostroboscopy is a sophisticated imaging technique that uses a microphone placed near the larynx to trigger a stroboscope to illuminate the vocal folds under high magnification. This enables the examiner to evaluate vocal fold vibration in slow motion to look for small irregularities of the vocal fold edge, such as scars or masses, which may interfere.



Dr. Rubin discussing videostroboscopy results with a patient.

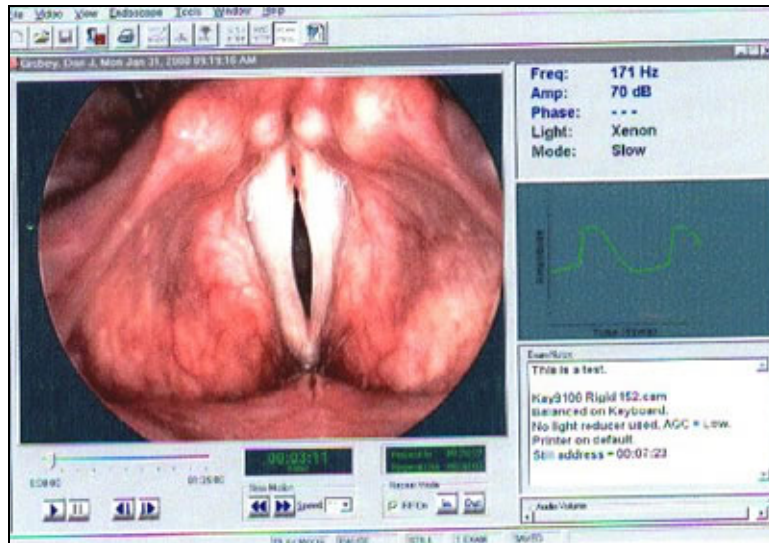


Image captured during videostroboscopy.

Laryngeal electromyography

Laryngeal electromyography evaluates the neuromuscular function of the larynx. It may reveal suspected or unsuspected nerve injury or neurologic disease. Laryngeal EMG is also used to guide injection of [botulinum toxin \(BOTOX®\)](#) in the treatment of [spasmodic dysphonia](#).