

# Swallowing Signals Lab

## A Therapy Tool

**T**he Swallowing Signals Lab is an ideal therapy tool for speech pathologists working in acute care and rehabilitation facilities. It is available as a stand-alone module or as part of KayPENTAX's Digital Swallowing Workstation. The versatile, PC-based system provides a variety of real-time visual displays derived from separate transducers, all related to critical aspects of swallowing. These transducers can be used in isolation, or concurrently, allowing the clinician to target specific behaviors followed by their immediate observation. Interrelationships between important swallowing parameters can be viewed in real time.

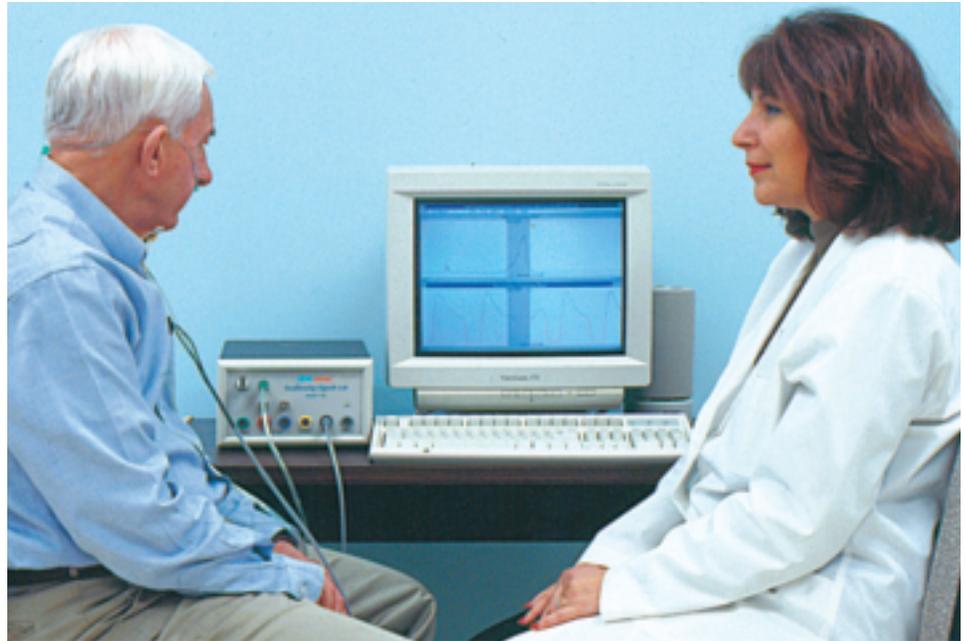
In addition to visual cues for the patient, quantitative measurements are provided which can be stored in the program's patient-listed database. Data can be compared over time to monitor progress based on objective parameters. An extensive bibliography substantiates the clinical usage of each transducer; KayPENTAX has integrated the analysis of these diverse signals into a single, convenient system with user-friendly software.

### **MULTIPLE TRANSDUCER RATIONALE**

Dysphagia can have a variety of contributing factors which a clinician may wish to address in therapy both from assessment and treatment standpoints. Depending on the patient, it is clearly advantageous to have available a multi-functional array of signals to assist with therapy goals. A summary of these is provided.

### **Surface Electromyography (sEMG)**

Numerous articles cite the effectiveness of using sEMG when teaching various swallowing maneuvers (e.g., Mendelsohn maneuver, Valsalva swallow, etc.). The transducer, usually placed in the submental region, facilitates achievement of therapy goals with the real-time display. Two channels of sEMG are provided, enabling the clinician to model the desired waveform



pattern or observe muscle activity at separate anatomic sites (e.g., buccinator and submental areas).

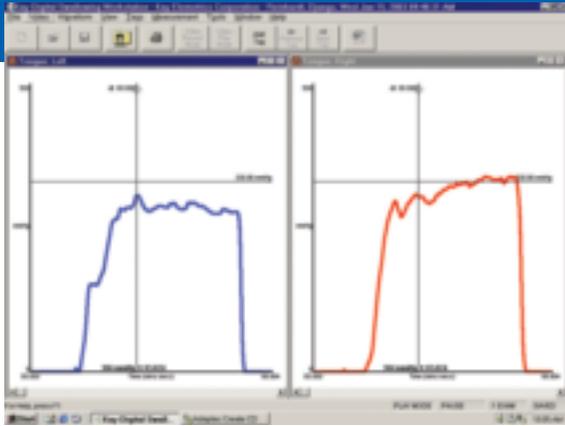
### **Features**

- ▼ **Multi-functional hardware/software system**
- ▼ **Real-time visual displays for therapy**
- ▼ **Quantitative measurements**
- ▼ **Multiple physiologic-specific parameters**
- ▼ **Report generator to summarize findings**
- ▼ **Designed "from ground up" for swallowing**
- ▼ **Compatible with complete Digital Swallowing Workstation**

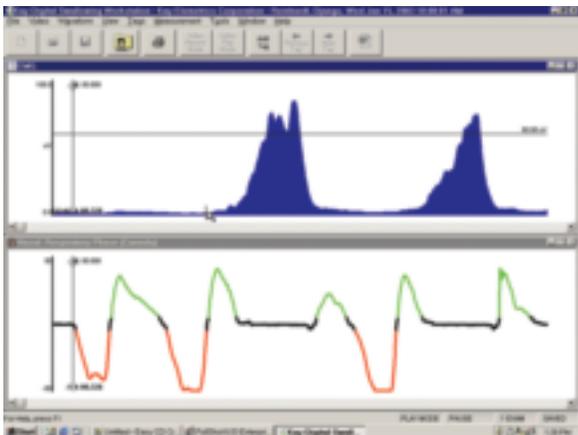
### **Respiratory Phase (Inspiration, Expiration, Apnea)**

To monitor or teach proper coordination between breathing and swallowing, a respiratory phase signal is provided. This signal is derived from a nasal cannula and is color-coded to assist with phase identification. Timing of respiratory phase in relation to the swallow can be monitored, both during and after swallows, with time-linked cursors.





*The multi-channel tongue array is available in different configurations. A two-channel array with bulbs on left and right side can be used to objectively assess strength and symmetry.*



*Coordination between breathing and swallowing can be seen by observing respiratory phase signal (lower) and sEMG signal (upper).*

## Tongue Array

If problems with the tongue are evident (e.g., paresis affecting bolus transport), the multi-channel tongue array can be used to quantify tongue strength and symmetry (i.e., left side vs. right side) to help objectify assessment. Therapy can focus on isometric exercises for the tongue in conjunction with visual display targets. As with all the transducers, measurements can be made to observe progress.

## Manometry

Pharyngeal/UES solid state manometry is normally performed in conjunction with fluoroscopy to assist with sensor placement. Pressure and timing measurements in the pharynx and the UES can be made with this transducer. With the Digital Swallowing Workstation

(see separate brochure), video and physiologic data can be acquired concurrently on one monitor; these are time-linked for precise correlational measurements.

## Cervical Auscultation

A useful bedside screening and therapy device, the stethoscopic microphone, placed in the submental region, allows the clinician and patient to aurally monitor the pharyngeal stage of the swallow and breathing. The acoustic waveform may also serve as a marker of the swallow when viewed with other data.

## Auxiliary Channels

The Swallowing Signals Lab provides two auxiliary inputs. These allow other signals of interest to be acquired simultaneously with those provided with the system.



*System transducers include (from left) tongue array, EMG electrodes, stethoscopic microphone, nasal cannula, and solid state manometer. Two auxiliary channels are provided for other signals of interest.*

*The external hardware module provides proper signal conditioning specific to each transducer. Color-coded input connectors facilitate quick setup for therapy.*



## OTHER SWALLOWING INSTRUMENTATION FROM KAYPENTAX

KayPENTAX also offers the complete Digital Swallowing Workstation, FEES, and Portable FEES systems. For further information, please contact the factory or your local representative (international).



## KayPENTAX

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