

Vij XP™

Vibration
Response
Imaging



Objective. Non-invasive. Radiation-free.
A new way to evaluate dyspnea patients in the ED.



CHF vs. COPD in the ED... A Critical Choice

- Over 4.5 million patients present to the ED with CHF and COPD each year
- Differentiating the origin of dyspnea as CHF or COPD is often difficult:
 - Physical exam findings, lab tests such as BNP, and chest radiographs can be nonspecific
- Rapidly and accurately determining the cause of dyspnea;
 - Is extremely important in proper patient management
 - Improves throughput and reduces cost

Know the Difference.

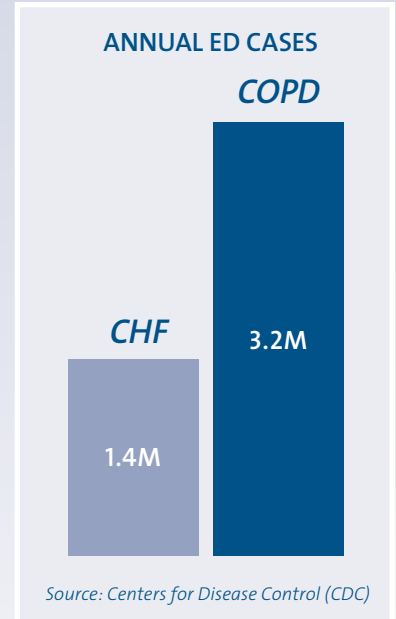
Selecting the optimal treatment path makes all the difference.

- Bronchodilator therapy may have a worsening impact on cardiac function in patients with CHF
- Diuretics may have a worsening impact on COPD patients who are already fluid depleted

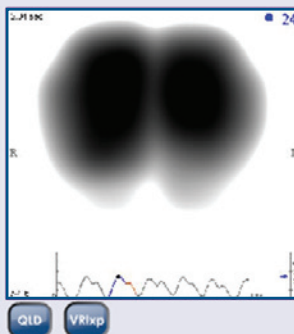
Differentiate. Treat. Manage.

VRlxp aids in diagnosis, monitoring and patient management.

- Identifies characteristics that assist in differentiating between CHF and COPD:
 - In a study of patients with confirmed diagnosis of CHF and COPD VRlxp was superior to published data for clinical judgment and comparable to CXR and the performance of BNP in the Breathing Not Properly Trial¹.
 - Three main VRlxp acoustic findings help differentiate COPD from other conditions; heterogeneity, vibration energy distribution differences between inspiration and exhalation and a significantly longer exhalation phase².
 - During acute CHF exacerbations, VRlxp shows more homogeneity in patients after clinical improvement³.
- Contributes to the process of differential diagnosis quickly, and at the point of care
- Serial measurements of patients to indicate treatment progress



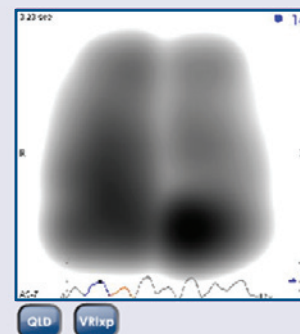
CHF Pre-Treatment



Reduction of breath sounds in the bases

(Courtesy of B. Wiederhold, MD; Highland General Hospital, Oakland, CA)

COPD Pre-Treatment



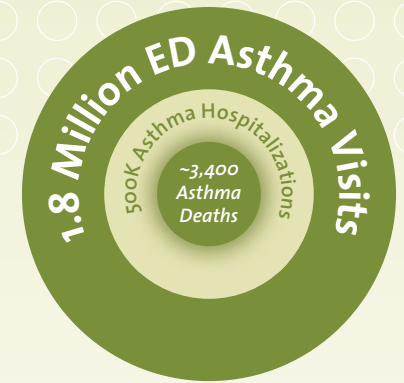
Dynamic disturbance seen in both lungs

(Courtesy of K. Guntupalli, MD; Ben Taub Hospital, Houston, TX)

1. Using VRI Lung Sound Measurements to Differentiate between COPD and CHF in the Emergency Department [Abstract]. Presented at the 2010 Western Regional SAEM Meeting.
2. Wang Z, et al. Lung Sound Analysis in the Diagnosis of Obstructive Airway Disease. *Respiration*. 2009;77(2):134-8.
3. Wang Z, et al. Respiratory sound energy and its distribution patterns following clinical improvement of congestive heart failure: a pilot study. *BMC Emerg Med*. 2010 Jan 15;10(1):1.

Asthma Management in the ED

- There are approximately 1.8 million adult ED visits for acute asthma each year; a significant percentage are uninsured
- Objective measures of obstruction and response to treatment in the ED are currently limited to peak flow and volume measurements:
 - Both are dependent on patient effort
 - Both can induce bronchospasms
- Better disposition decisions may reduce ED bounce-back rates, reducing costs



Sources: CDC and American Academy of Allergy, Asthma & Immunology

Easy. Objective. Rapid. Reproducible.

Because you want to make the right disposition decision...the first time.

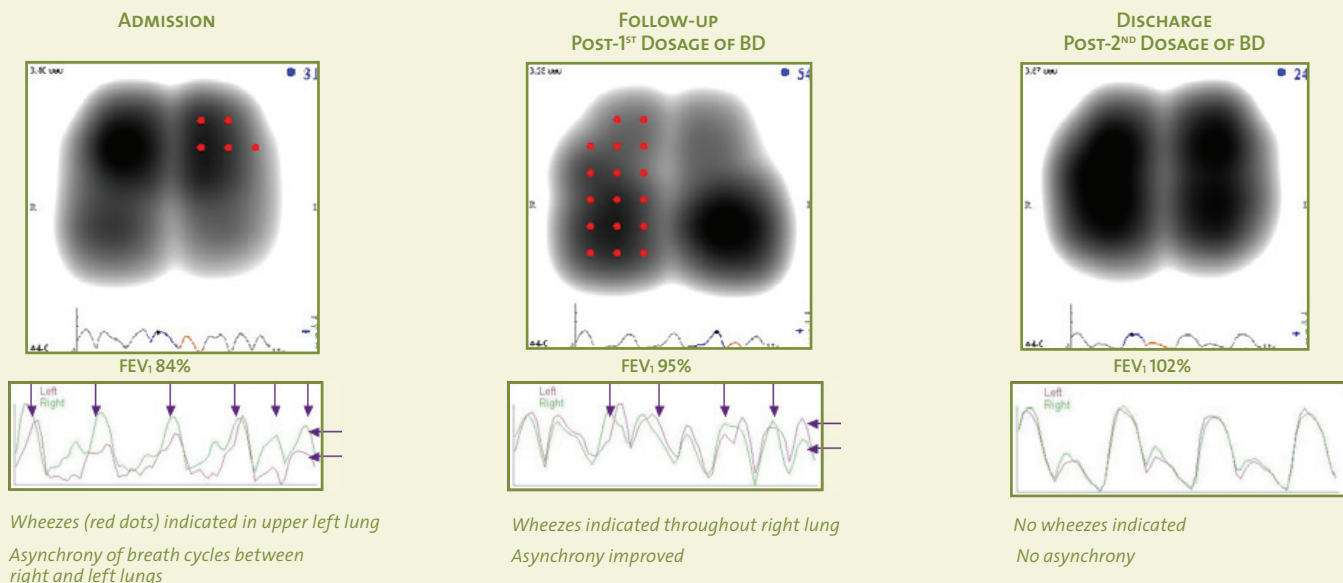
- Easy, non-effort dependent procedure eliminates patient variability with current methods
- Objective measure of airway obstruction provides a more precise clinical picture of asthma exacerbations
- Rapid, functional assessment of bronchodilator response saves valuable time and reduces the probability of bounce-backs
- Reproducible look at regional lung function over time means decision confidence from ED admission to discharge

The New Multi-tasker.

VRIxp aids in diagnosis, monitoring and patient management.

- Asynchronous breath sounds between the lungs during acute exacerbations of asthma:
 - VRIxp shows significantly higher levels of inspiratory and expiratory asynchrony between right and left lungs in asthmatic patients compared to non-asthmatic patients⁴.
 - Respiratory acoustic analysis demonstrated significant asynchrony between right and left lungs during asthma exacerbations, which was significantly reduced following treatment⁵.
- Automatic identification of lung sounds consistent with wheezes
- Serial measurements of patients to indicate treatment progress

VRIxp images before and after bronchodilator treatment.



(Courtesy of Z. Wang, MD; Cooper University Hospital, Camden, NJ)

4. Pollack, Charlie, et al. Comparison of VRI Patterns in Acute Asthmatic Patients and Non-asthmatic Patients in the ED [Abstract]. Presented at the 2010 National SAEM (Phoenix) and Western Regional SAEM (Sonoma) Meetings.
5. Wang Z, et al. Asynchrony between left and right lungs in acute asthma. J Asthma. 2008 Sep;45(7):575-8.

VRlxp brings objectivity and simplicity through the doors of the ED.

Clinical Sense in the ED

- Objective and repeatable results enhance physician confidence in diagnostic and management decisions for:
 - CHF
 - COPD
 - Asthma
- Non-invasive, radiation-free complementary tool to chest X-ray
- Easy and non-effort dependent procedure increases patient comfort and reduces clinical variability
- Immediate results at the bedside saves time when time is of the essence
- Convenient monitoring of therapy results at the point-of-care speeds patient disposition decisions
- Faster and better patient disposition decisions means reduced bounce-back rates and significant cost savings

Designed for ED Efficiency

- Mobile base facilitates rapid mobilization at the bedside
- Simple, intuitive graphical user interface
- Minimal patient effort - only 15 seconds of normal tidal breathing per recording
- Rapid, automatic data analysis and on-screen results
- Repeatable, serial recordings to monitor changes in lung status

Clinical Know How

- Solid research and relationships with key ED opinion leaders
- 29 peer-reviewed articles supporting the validity of our innovative VRI technology
- Over ten years of investment, research and development



*Thousands of patients recorded
at hundreds of clinical sites
around the world*

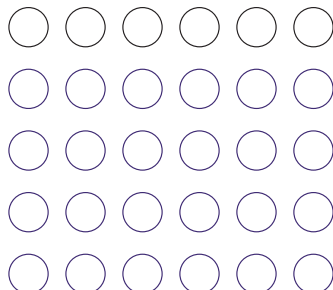
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*The VRlxp is an FDA approved device
which assists in diagnosis, monitoring
and patient management.*

