

# Technology & Clinical REPORT

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Advances in  
pulmonary management of  
the critically ill infant

 **bunnell**  
INSPIRED INFANT CARE

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## Snowbird HFV Conference 2007- Numerous HFJV Presentations

Life Pulse presentations covered a variety of topics reflecting the broad range of clinical rescue applications as well as evaluating HFJV physiologically and from a nursing perspective.

Craig Campbell, RRT, Mount Sinai Hospital in Toronto, Ontario, presented a retrospective chart review of four patients treated successfully with iNO and the Life Pulse for MAS with PPHN. The total duration of iNO therapy ranged from 30-120 hours and the total duration of ventilation ranged from 4-7 days. Three of the four patients were switched from CMV to HFJV, while the fourth was transitioned from HFOV.  $F_{I}O_{2}$  requirements decreased significantly during the first 48 hours from 1.0

to 0.37 while Oxygen Index (O.I.) decreased from 26 to 5.6.

Elsie Mainali, MD, Virginia University Health System, Richmond, VA, presented a retrospective study of 38 term or near-term ECMO candidates transported on the Life Pulse with iNO vs. CMV with iNO over a 7-year period. Patients transported on the Life Pulse had significantly better ventilation and a trend toward better oxygenation on lower pressures compared to those treated with CMV. Dr. Mainali concluded that transporting ECMO candidates on the Life Pulse was safe and effective and may be superior to CMV when ventilation is the primary concern.

Kim Breinich, RRT, Lehigh Valley Hospital, Allentown, PA, presented a case study of a rescue application of the Life Pulse in a 24-week gestation infant with severe chronic lung disease

and respiratory failure. The patient was treated with CMV and HFOV with iNO and heliox therapy at separate times prior to going on HFJV. She speculated that this patient's successful recovery on HFJV may have been due to their ability of providing appropriate mean airway pressure while maintaining an advantageous I:E ratio (1:11) at a rate of 260 bpm to prevent overdistention.

Andora Bass, MD, University Health Systems of Eastern Carolina and Pitt County Memorial Hospital, Greenville, NC, reported on an animal study she conducted during her fellowship at Duke University Medical Center. Their goal was to determine what level of PEEP was needed to match the MAP on HFOV when transitioning patients from HFOV to HFJV. She demonstrated that

oxygen delivery was similar using HFJV or HFOV when equivalent mean airway pressure was used in a piglet model of ARDS.

Rita Rinaldo, RN, Sunnybrook Health Sciences Centre, Women's College Campus, Toronto, ON, presented a case study from a nursing perspective. Their patient was a 24-week gestation, 665-gram infant who was treated on CMV and HFOV prior to developing a tension pneumothorax requiring CPR. The patient was then stabilized on the Life Pulse after a chest tube was placed. A second pneumothorax developed three days later, but both pneumos resolved by day six of life. Bacterial pneumonia followed, and the patient remained on HFJV for 30 days before being weaned to CPAP.

The final presentation on HFJV was by Mohammad Attar, MD, University of Michigan and Mott Children's Hospital, Ann Arbor, MI. Dr. Attar presented a case study of a patient with severe BPD and pneumonia treated with the Life Pulse via tracheostomy tube. The patient was treated



on CMV and HFOV for respiratory failure prior to going on the Life Pulse. HFJV was implemented by placing the LifePort adapter directly into the trach tube opening and stabilizing the connection by using a rubber band. The infant was maintained on the Life Pulse for four days but unfortunately oxygenation remained poor and care was eventually withdrawn.

These presentations represent a broad range of clinical applications. Patients were started on the Life Pulse at 3.5 hours to 101 days of life. Gestational ages ranged from 24 to 42 weeks with diagnoses of MAS with PPHN, pneumothorax, CLD, respiratory failure, pneumonia, and HFJV therapy with and without iNO delivered via ET and tracheostomy tubes. The presentations illustrate the unique capabilities for which the Life Pulse has gained a reputation as an indispensable tool in NICUs and PICUs.

Copies of these abstracts and papers are available upon request by contacting Dave Platt at [plattdr@bunl.com](mailto:plattdr@bunl.com) or 800.800.4358 ext. 15.

Don't forget to prepare and submit your abstracts for the HFV Conference in March of 2008. It's a great opportunity to share your experience and expertise with other clinicians. The skiing and scenery aren't too shabby either.

## INOMax DS Validated with the Life Pulse

Yes, that's right. The Life Pulse is now validated as a compatible ventilator for the delivery of iNO using the INOMax DS. Testing data were submitted this summer and approval was granted this fall.



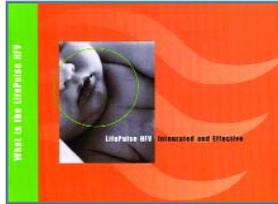
Diagrams and the necessary connectors will be provided by INO Therapeutics with each INOMax DS. Bunnell will still provide technical support, but now support will also be available through INO Therapeutics.

Please inform all the clinical and risk management personnel at your hospital, so this life saving therapy can be implemented when appropriate.

Bunnell would like to extend a special thanks to Jeff Schmidt, RRT at INO Therapeutics for his unbiased efforts in evaluating the Life Pulse.

## What, Why, and How?

Bunnell is excited to announce the introduction of a pocket reference set on the Life Pulse High-Frequency "Jet" ventilator. The three pocket references cover What the Life Pulse is, Why it is effective, and How to use it successfully. These booklets are the culmination of our 24 years of experience with the Life Pulse. Together they provide comprehensive yet concise information on the



Life Pulse and how to maximize its clinical benefits.

Our goal in producing the pocket references is to improve patient care and outcomes by standardizing the clinical understanding and implementation of the Life Pulse. Thus, we encourage your feedback on the content and its implementation.

In September this year, a sample kit with the three booklets was mailed to every respiratory and neonatology department that uses the Life Pulse. An order form was included with each kit, so additional copies could be requested in appropriate numbers to



meet each department's need.

If your department has not received additional copies of the booklets, you can request an order form by contacting Dave Platt at [plattdr@bunl.com](mailto:plattdr@bunl.com). The order form asks you to provide key contacts in your department, so that Bunnell can update its mailing list and contact database for each hospital.

This information will help us serve you better by allowing us to contact the most appropriate person in your department with important announcements, updates, and advisories. Please take the time to fill out the order form in its entirety and make sure the information provided is legible.

Response to the pocket references has been overwhelmingly positive. So far, we have sent out over 4,000 copies of each booklet. The second printing is in process, so don't delay...order your Life Pulse What, Why, and How Pocket References today.

## Two Clinical Specialists Needed

Growth in Life Pulse usage and sales has increased on average 22 percent per year for the last 5 years. Last year our business increased by 40% and this year we are up 50% over last year. This rapid growth has increased demand for training and sales support in the Northeastern Atlantic and Upper Midwestern states.

As a result, Bunnell has immediate openings for two

full-time clinical specialists. Applicants must be registered respiratory therapists with 5 years of NICU experience and 2 or more years of Life Pulse experience. Applicants must live in the territory they are applying for or be willing to relocate to the territory they are hired to represent.

Bunnell offers a competitive compensation package that includes a base salary, bonuses, commissions, vacation and personal time, medical and dental coverage, 401K, profit sharing, tuition assistance and a stock based retirement plan.

Bunnell is an equal opportunity employer and is entirely employee owned, with no debt.

For more information or to submit your resume contact Ken Hekking, Vice President of Sales and Marketing at [khekking@bunl.com](mailto:khekking@bunl.com) or 800.800.4358 ext. 13.

## How Long Do Circuits Last?

The Life Pulse humidifier circuit is guaranteed for 7 days of use. If the circuit fails in the first 7 days, call the Bunnell Hotline, 800.800.4358 and one of our clinical specialists will help troubleshoot humidification problems and confirm circuit failures. They will record the lot number of the circuit and ask that the circuit be returned for evaluation and possible credit.

If the circuit is older than 7 days, call the Hotline as well. We will provide the same

troubleshooting help to determine if the circuit is at fault. If we determine that the circuit is not the problem, you will avoid changing out a perfectly good circuit.

Not all humidifier alarms are caused by the circuit. Some alarms are caused by humidifier hardware. If in doubt, call the hotline and we will help you determine the cause of the alarms quickly and efficiently!

### **Original Patient Box, Now Obsolete**

Effective October 23, 2007 the original style Patient Box (Cat.# 310) was officially retired. Parts and service are no longer available. Our new Patient Box, the "WhisperJet" (Cat. # 312) replaces the 310.

If you have not upgraded to the WhisperJet, now is the time. The "WhisperJet" has been in production for four years. It has proven to be a safe and reliable replacement for the original patient box. Noise output is significantly reduced with the WhisperJet, thus the name.

To obtain a quote or to receive additional information on the WhisperJet contact Ken Hekking at [khekking@bunl.com](mailto:khekking@bunl.com) or 800.800.4358 ext. 13.

### **Do You have Circuits in Stock?**

Circuits are not included with rental ventilators, because they are too easily broken in transit. Therefore, it

is critical that rental customers stock circuits, so they can utilize the Life Pulse as needed.

We suggest that a minimum of four circuits be kept in stock at all times. This quantity gives you adequate backup if a circuit should fail prior to our 7-day guarantee period. If one of our circuits fails before 7 days of use, contact Bunnell for a return authorization number, and we will replace defective circuits at no charge.

Any time your circuit stock drops below 3 circuits, place an order for more. The money and time you will save by not ordering circuits on an emergency basis will more than offset restocking costs.

Plan ahead: keep Life Pulse circuits in stock!

### **"WhisperJet" Patient Box Troubleshooting**

The WhisperJet Patient Box (Cat# 312) has been a great success. With the original patient box now obsolete we want to remind all our customers about special troubleshooting considerations using the WhisperJet.

The pinch valve in the WhisperJet is a precision valve. Alignment and maintenance of the valve is more important than with the original patient box. Valve alignment can be affected by dropping the patient box, so it is important to handle the WhisperJet carefully at all

times. Annual maintenance is also critical to ensure proper performance.

All WhisperJet patient boxes should be inspected for visible damage prior to use. Signs of damage may include cracks at the corners, loose or damaged handle, barbed connector, or patient box cable. If there are any signs of damage, the patient box should not be used. Arrangements should be made to get a return authorization number (RA#) to return the WhisperJet to Bunnell for service.

If the WhisperJet ever stops cycling while running on a patient, press the Standby button before doing any troubleshooting. Going to the Standby mode releases the pressure in the Life Pulse circuit, so high pressure and large tidal volumes can't be delivered to the patient.

Disconnect the patient box from the patient and perform an operational check using a test lung to determine if it is running properly. Call the Bunnell hotline to get assistance in evaluating the patient box if you have any question about its performance.

If you have questions about the WhisperJet, contact our customer service department at 800.800.4358, ext. 6. One of our clinical specialists will be happy to answer your questions.

## Research Papers & Case Studies

Do you have a study in mind, but need help developing the protocol? Maybe you have a protocol, but you need some support to get the project started. Whatever support you need, Bunnell can help.

Bunnell is always interested in case studies and research papers. If you have a study or paper you would like to share with other clinicians, we would like to help.

We can help in the editing or proofing process. We can distribute copies of papers to other clinicians for feedback.



We can publish articles and abstracts in our newsletter. And, we can post information on our website.

The Snowbird Conference on High Frequency Ventilation of Infants, Children & Adults, March 25-29, 2008 is also a great place to share your Jet experiences with others. Papers can be submitted to Don Null, MD at Primary

Children's Medical Center, Salt Lake City, UT, through the first part of January 2008.

If you need some assistance or if you want to discuss ideas for a research project, contact Dave Platt at [plattdr@bunl.com](mailto:plattdr@bunl.com) or 800.800.4358 ext. 15

## PRN In-service Trainers Wanted

With the Life Pulse being used more than ever, requests for training have increased. Training clinicians is one of the most important services Bunnell provides. We are always looking for bright, enthusiastic respiratory thera-

pists with "Jet" experience to add to our family of training specialists.

Training Specialists are used for in-service training, demos, evaluations, emergency clinical support and regional conferences. Bunnell provides extensive training and certifies respiratory therapists before utilizing them in the field.

Training Specialists must have the flexibility to travel. Trips are usually one to two days. Reimbursement is on a per diem basis with all expenses paid.

If you're looking for a new challenge and want to share your knowledge of the Life Pulse with other clinicians, contact Evan Richards at [evan@bunl.com](mailto:evan@bunl.com) or 800.800.4358. ext. 37

## Service Seminar 2008

The Bunnell Service Seminar is a technical service training program geared toward clinical engineers and biomedical technicians. The two-day seminar is held in Salt Lake City, Utah, in September each year. The program covers the theory of operation, clinical troubleshooting, bench top evaluation, and preventive maintenance procedures.

The registration fee of \$1,200 includes ground transportation, continental breakfast, and lunch, as well as a service manual and test equipment unique to the Life Pulse ventilator.

Class size is limited to eight participants and is reserved on a first-come first-served basis, so register early. The class agenda and registration form are available on the Bunnell website at [www.bunl.com](http://www.bunl.com) under the Technical menu. For additional information on registration or hotel accommodations contact David Platt at 800-800-4358 ext.15 or [plattdr@bunl.com](mailto:plattdr@bunl.com).