Founded in 1989

The Post-Polio Support Group of Orange County Newsletter

15231 Marne Circle
Irivine CA 92604

MAY 2010

Salk Institute Symposium Part 3

Neuromuscular/Respiratory Equipment and Uses

In this issue, we are continuing our series on the findings presented at the Salk Symposium in La Jolla in November, 2009. The first was the basic physiology article on musculoskeletal support for Respiratory Systems and in the second article, Dr. Noah Lechtzin, Dirctor of the John Hopkins ALS Clinic, gave us further information on that structure and Diseases affecting it, Diagnostic tools and Treatment. Our final in this series on the Equipment and Devices for patients who have breathing disorders is in this newsletter. The presentation in full is available via PolioToday.org or on 3 DVDs.

Inside this Issue

What is The Best Respiratory Support For Breathing Muscle Weakness?

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John Hopkins Medical Center
Baltimore, MD

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Northwest Assisted Breathing Center
University of Washington Medical Center
Seattle, WA

Three Goals of Supporting Breathing Muscle Weakness

Ventilation:
What is the best means of support?
Tracheostomy ventilation:
Traditional means of support
Secure means of ventilation
Noninvasive ventilation:
Easily applied and removed
Use "as needed" ventilation
Less complications

Noninvasive Ventilation

Ventilation Alternatives:
1. Noninvasive bilevel pressure (BiPAP)
Pressure support ventilation (augmentative)
IPAP (Inspiratory Positive Airway Pressure)
EPAP (Expiratory PAP)
IPAP
Difference = Pressure Support

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EPAP
More "fluid" means of support
Spontaneous/Timed Ventilation Mode
Important "ventilator" feature for neuromuscular ventilation
Provides backup support ventilation during REM sleep.

Considerations in Initiating Bilevel Pressure Ventilation

S/T Ventilator Features:
Ventilator Synchrony
Rise time
Inspiratory time max.
Inspiratory & expiratory trigger sensitivity
"Wide Span" bilevel pressure support
EPAP 3-5 cwp to flush exhaled gas
IPAP to improve PS

Determining The Correct Interface:

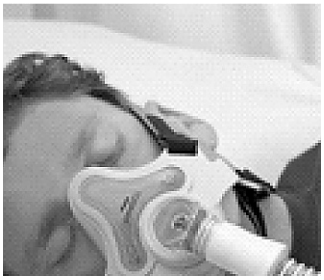
Nasal/Facial architecture?
Primary nasal/oral breathing?
Anatomic
Previous nasal injury
Chronic rhinitis
Claustrophobia?
Bulbar (mouth/upper airway) weakness

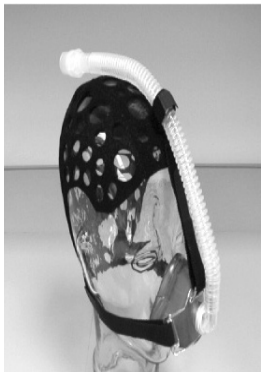
There are several types of devices that aid one or more of these functions.

SLEEP DISORDERED BREATHING

- Sleep Apnea
  - Intermittent cessation of breathing
    - Obstructive
    - Central
    - Mixed

Bilevel Pressure Ventilation Interface Alternatives





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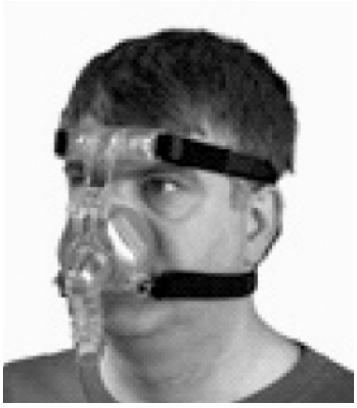
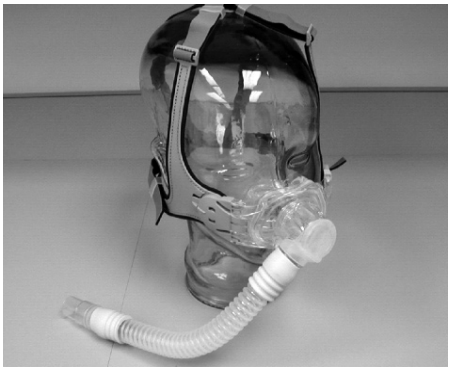
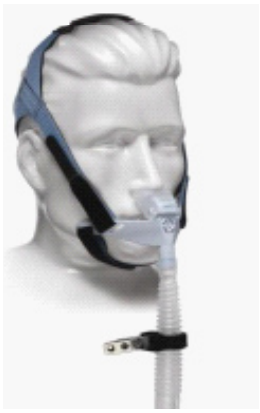
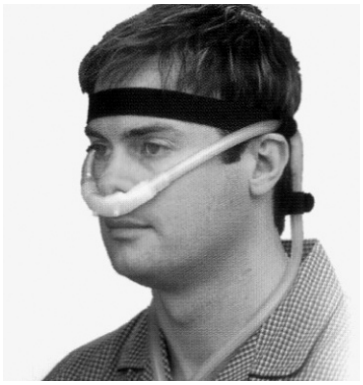


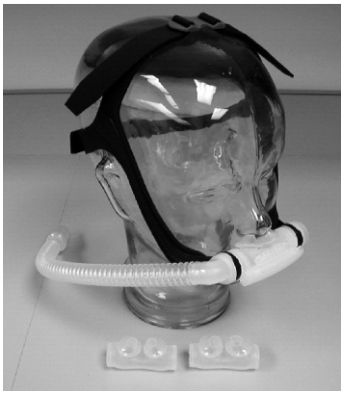


Non-invasive Bilevel Pressure Ventilation

Interface Alternatives For Claustrophobia







Ventilation Alternatives:

1. AVAPS (average volume insured pressure support)

Self adjusting pressure support increases breathing support with progressive weakness.

Based on a pre-set tidal volume.

2. Pressure Control

More effective?

Less air in the stomach

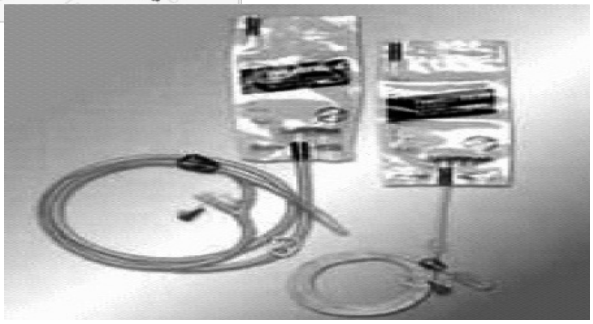
Aids To Noninvasive Ventilation

Sleep Comfort Care Pad

Soft adherent gel barrier

Decreases nasal bridge pressure

May improve mask seal Farrell Valve or Super Valve: Reduces air in the stomach with the use of BiPAP Volume/Pressure Cycled Home Ventilators



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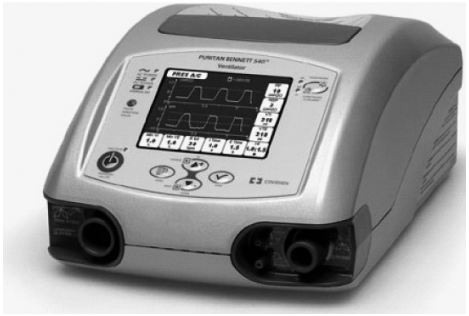
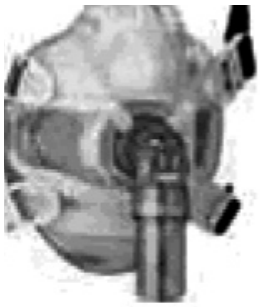


Volume-Cycled /Pressure-Time Cycled Home NIV

Combining non-vented mask with:

1. volume- cycled ventilation



2. Pressure/time-cycled Applications:

1. High IPAP not tolerated
2. PS no longer effective
3. Development of gastric air

Three Goals of Supporting Respiratory Muscle Weakness

2. Hyper-inflation Therapy

Why Hyper-inflation?

Range of motion exercise for the lungs and chest wall.

> Decreases atelectasis

> Improves lung & chest wall flexibility.

> Can improve (decrease) the work of breathing.

3. Cough Augmentation Therapy:

Manual Hyperinflation Alone

Hyperinflation + Abdominal Compression

3. Mechanical In-Exsufflation

Manual Cough Augmentation

Quad Cough Maneuver

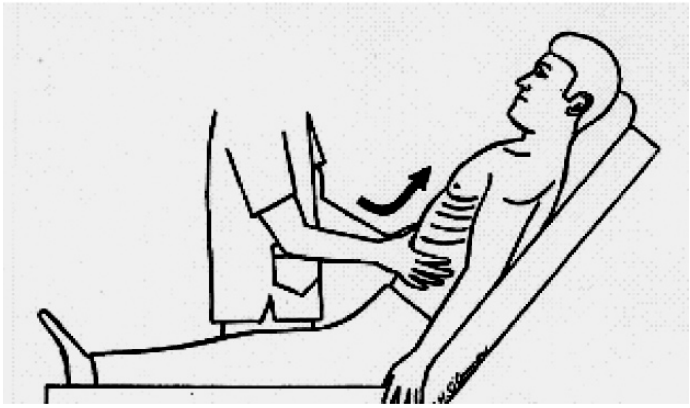
Improves expiratory cough flows

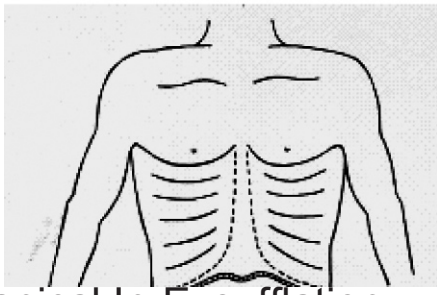
Kirby NA, Arch Phys Med Rehabil 1966;47:705-10

Abdominal splint prevents paradoxical motion

Requires skilled caregiver and coordinated effort

Inspiratory volume dependent

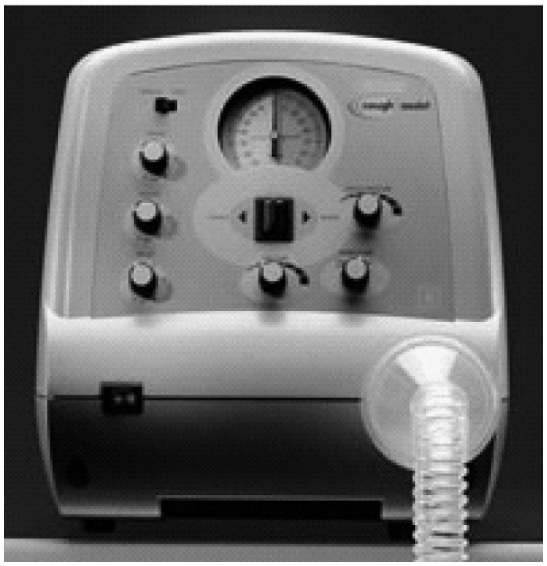




Mechanical In-Exsufflation
Mechanical
In-Exsufflation (MIE):
Insufflation Phase
Positive pressure limited hyperinflation
Immediate +>- Pressure Change

Exsufflation Phase
Negative Pressure limited expiratory velocity.

Mechanical In-Exsufflation
Adult Pressure Settings:
Range +/- 60 cwp
Optimal 40 / -40 cwp
J.H. Emerson Cough Assist Guidelines
Chest wall/abdominal restriction
Airway resistance
> +/- 60 cwp
Gomez-Marino E. etal, Phys Med Rehabil 2002;81:579-583
Pediatric Pressure Settings:
Mean 30 / -30 cwp
Range 15 to 40 / -20 to -50
Miske LJ, etal Chest 2004; 125:1406-1412



Modified In-exsufflation Mask Can Manage Oral Airway Weakness
Indication: Ineffective Exsufflation due to:
1. Enlarged tongue
2. Tongue/oral muscle weakness

Modified mouthpiece mask prevents tongue blockage during exsufflation

Mechanical In-Exsufflation
MIE via Tracheostomy
Benefits:
Well tolerated
Decreased frequency
Decreased secretion stimulation

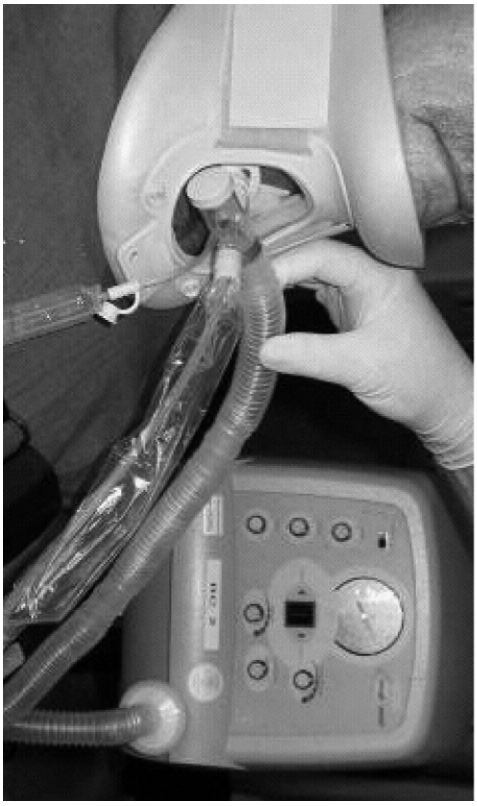
Mucus Mobilization Therapy

An Adjunct to Cough
Augmentation Therapy
Indications:
Airway disease affecting mucus clearance
Mucus plugging should be done with cough augmentation habil 2003;82:750-53

Decreased airway trauma
Ventilation with MIE

Mucus plugging

Should be done with cough augmentation



Home Oximetry Monitoring
Indications:

Developing hypoventilation
Developing respiratory infection
Protocol:
Oxygen saturation less than 95% indicates:
Lack of adequate ventilation
Developing lung congestion due to respiratory infection

Tracheostomy Ventilation
Indications

The development of bulbar weakness
Noninvasive ventilation no longer tolerated
Noninvasive ventilation not effective
Personal choice to undergo tracheostomy ventilation

Home Ventilation Resources
International Ventilator Users Network (IVUN)
Post-polio Network
"Take Charge Not Changes"
A comprehensive program of homecare support

This presentation included some case studies for which we had too much space limitation to include. It is hoped that for those who want or need additional information, or clarification, you will go to the original sources, Dr. Lechtzin and Mr. Boitano. The editors had to make decisions as to the content that was of the greatest interest or benefit to our readers and apologize that we are unable to include everything that was presented by the three experts who were at the Symposium.

I would also like to suggest that you go online to the PPSManager.com for related articles which have recently appearred on these subjects.

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How to contact Rancho Support Group

The Rancho Los Amigos Post-Polio Newsletter is published as a joint venture with the Polio Survivors Association.

For additional information please call Richard at **562-862-4508**

Or email us:
Rancho PPSG@hotmail.com

"And this one is wired directly to his lawyer..."

How to contact OC Support Group:

Call us for information:
Marte Fuller **562-697-0507**
Marilyn Andrews **714-839-3121**

Newsletter co-editors:
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renison@cox.net

Agenda ideas for PPSG of OC?
Please call Aleta at 949-559-7102 or email Priscilla at prisofoc@aol.com

Special thanks to the following donors: Jean Dille, Robert Brandquist, Rowland Rice, Betty Charron, Walter Wilson, and Paula Warren. We mention donations but not the amount, as all donations make our support group possible. Please write checks to **Polio Survivors Association** and write "Orange County" in the memo section. Please **mail checks to** Priscilla Hiers, Treasurer PPSG of OC, 18552 Cork Street, Fountain Valley, CA, 92708.

Rancho Los Amigos Meeting

Sunday May 23rd

2 PM - 4 PM- Dr. S. Perlman

Joint Mtg with OCPPSG

Villa Park City Council Chambers

(see map at bottom right)

Orange County Meeting

Sunday, May 23rd

2PM - 4PM

Dr. Susan Perlman

UCLA Neurology Dept.

Annual Update on Research and Findings on Post-Polio

Future Rancho SG Meetings

Saturday June 26th

Annual

Picnic & Bar-be-que

Map in June 1 Issue

Saturday July 24-

Documentary Film "The Final Inch"

Future PPSG of OC Meetings

Saturday June 12th 2-4 PM

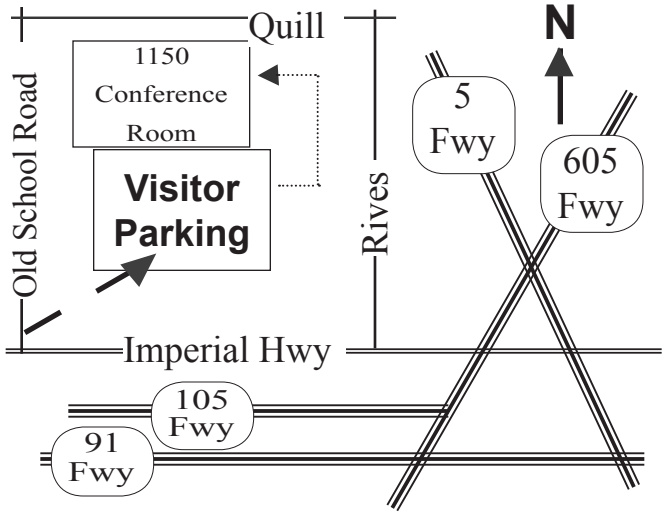
Getting Seated for a Wheelchair

St. Jude's PT/OT & Seating Ctr

Julie Simpson, Mgr, Lori Morris & Brian Arakaki

SATURDAY July 10th

To be determined



We meet **4th Saturdays 2 - 4 PM**

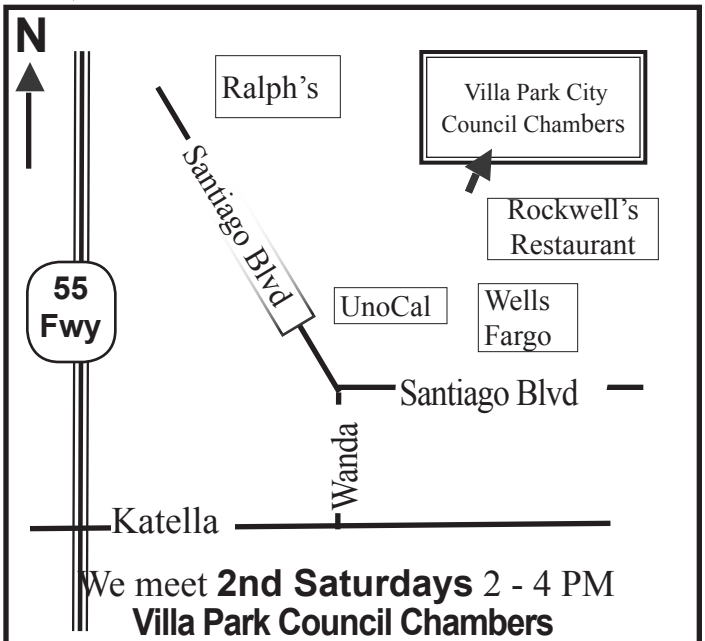
Rancho Los Amigos

National Rehabilitation Center

7601 E Imperial Hwy Downey

1150 Conference Room

Support Service Annex



We meet **2nd Saturdays** 2 - 4 PM

Villa Park Council Chambers

17855 Santiago Blvd. Villa Park

May meeting usually on a SUNDAY

December at Rancho in Downey