

Long Term Oxygen Therapy LTOT

Getting Better all the Time

Patrick Dunne's lecture

Given by

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Managing Director

Valley Inspired Products



Current Home Oxygen Programs

- Equipment focused
- Managed by economics
- Wide variety of products
- Little to no research on effectiveness
- Lack of understanding of products
- No outcome measurements or criteria

The Good News

- Things will change!
 - Physicians are becoming aware of the problem
 - Patients are becoming involved
 - New Products are entering the market
 - Information is available
 - Living with Oxygen is a lifestyle not a death sentence

Oxygen Products

- Stationary or Portable oxygen
 - Compressed gas
 - Liquid oxygen
 - PSA
 - Oxygen conserving devices (OCD)
 - Non Delivery Systems
 - Portable Oxygen Concentrators (POC)
 - Home transfilling system

Conserving Devices

- Multiple choices
- How do they work?
 - Capabilities
 - Limitations
- Titrate for dose
- Understand the objective (patient oxygenation)



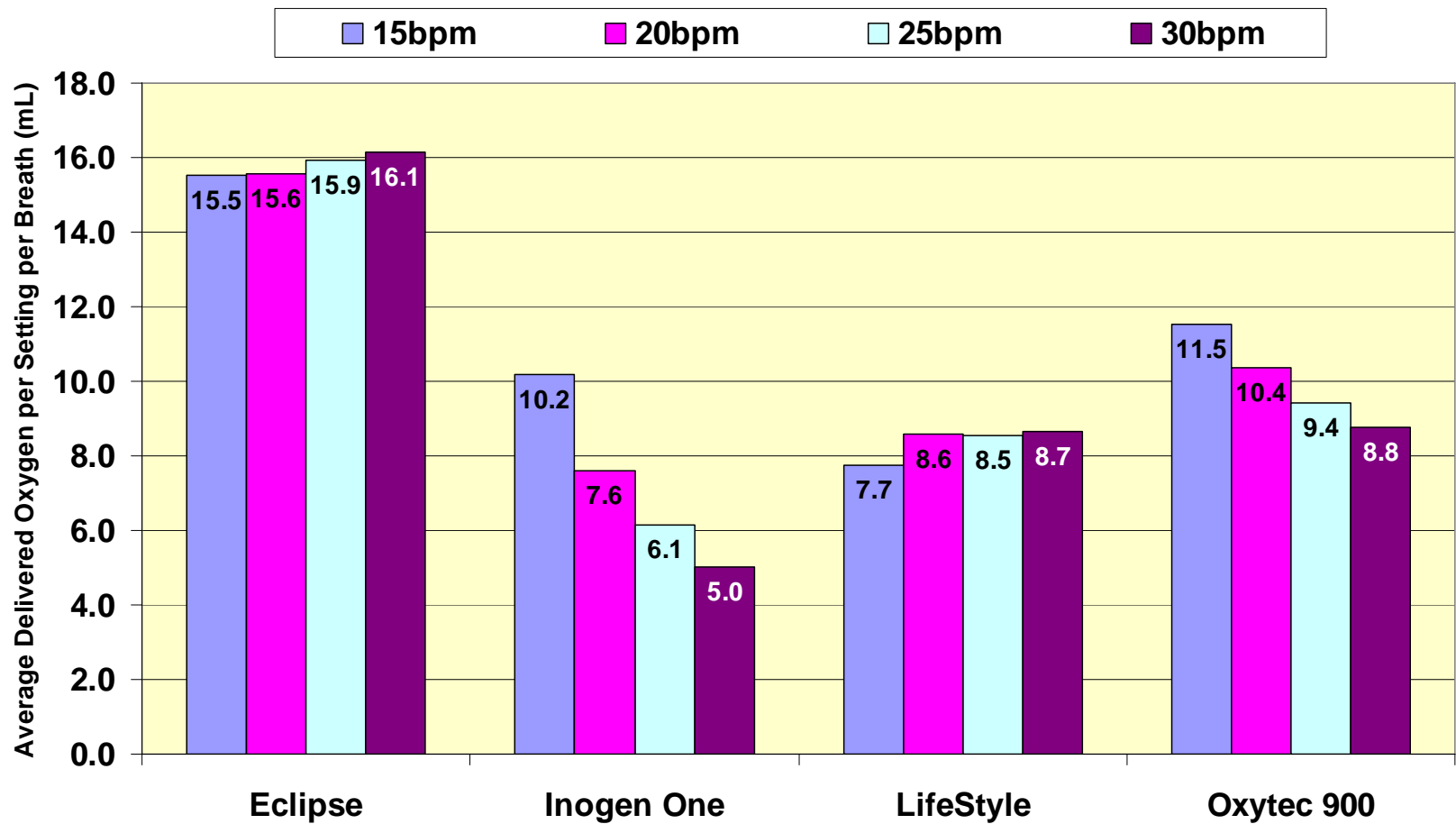
Portable Concentrator

- Improved operational range with access to ac or battery
- FAA approved
- Issues
 - Max. oxygen generation
 - Max. oxygen dose
 - Sleeping
 - 24 hour use



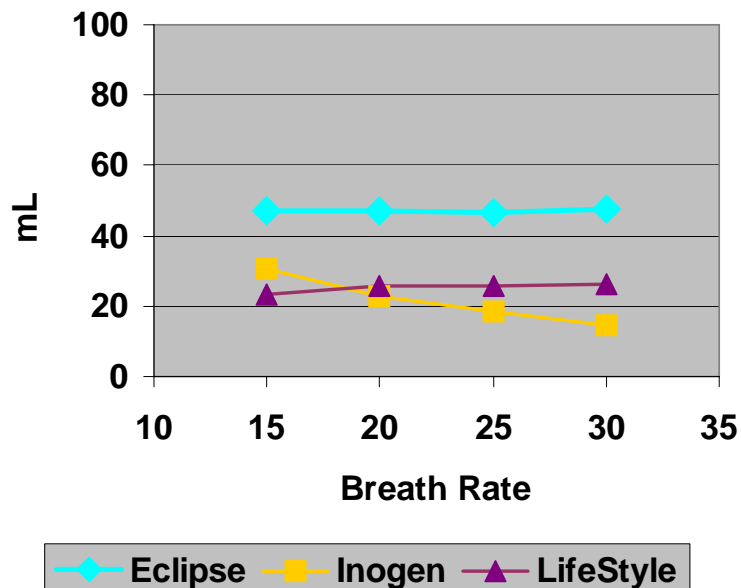
Oxygen Dose Per Setting

15, 20, 25, 30 Breath per Minute

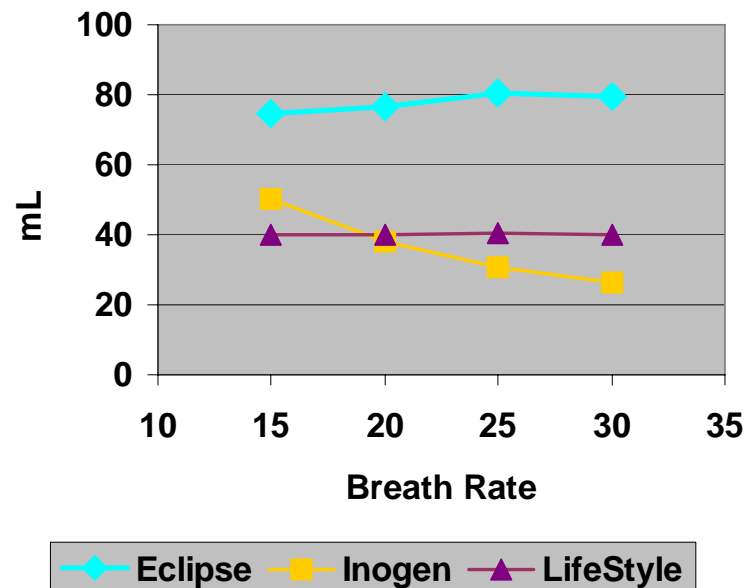


Delivered Oxygen Volume

mL/Breath versus Breath Rate
Setting=3

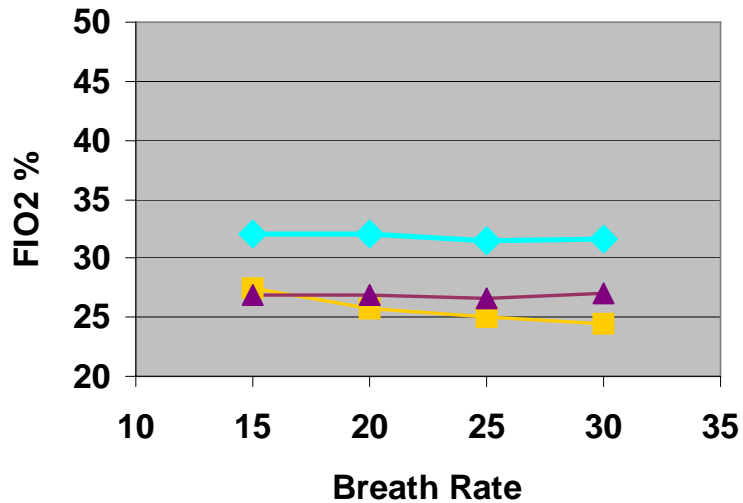


mL/Breath versus Breath Rate
Setting=5



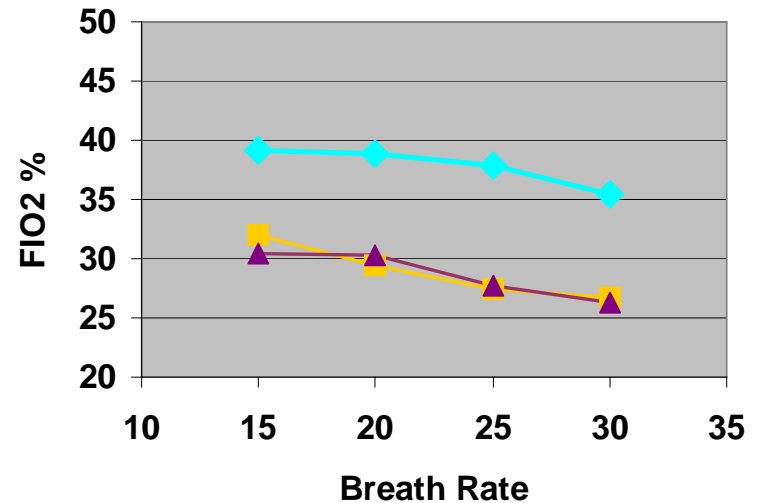
FIO2 at Higher Settings

FIO2
Setting=3



◆ Eclipse ■ Inogen ▲ LifeStyle

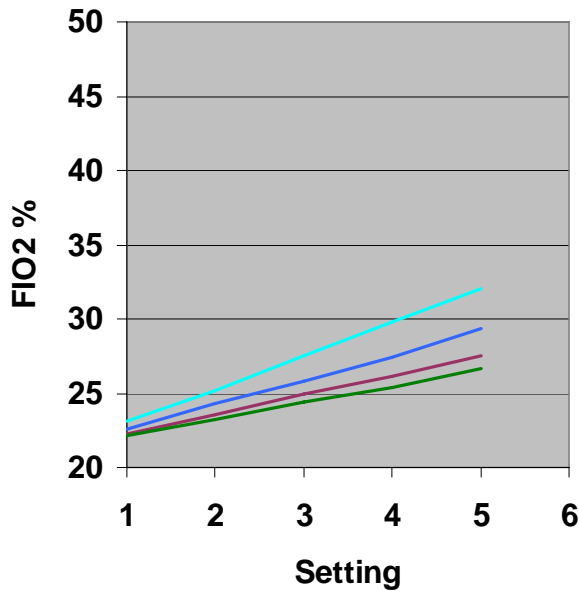
FIO2
Setting=5



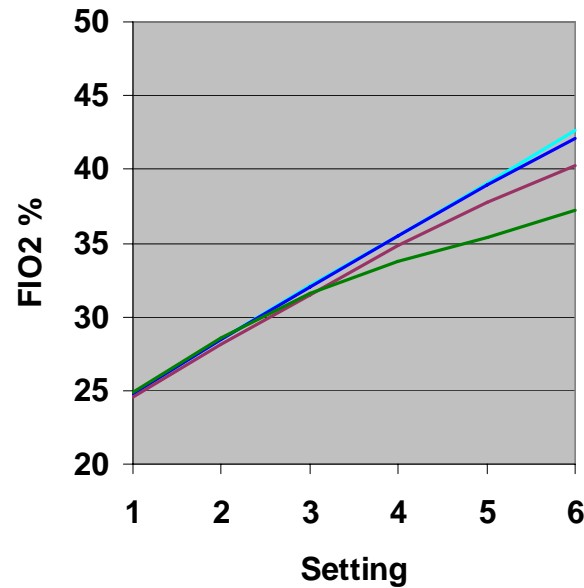
◆ Eclipse ■ Inogen ▲ LifeStyle

FIO2 at Higher Settings

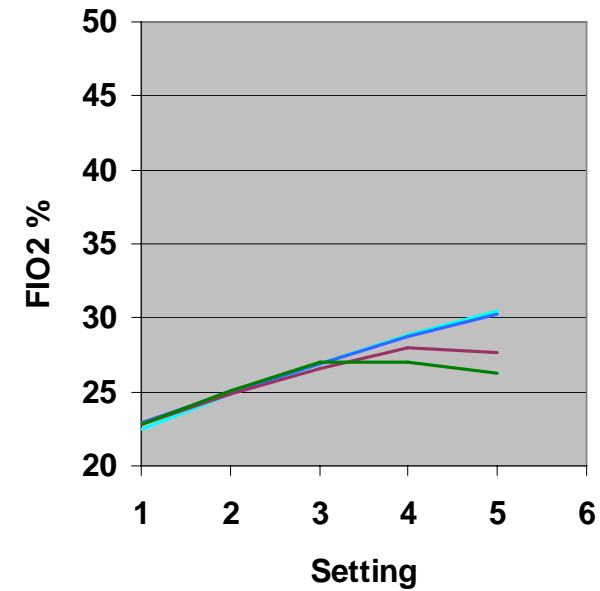
Inogen



Eclipse



LifeStyle



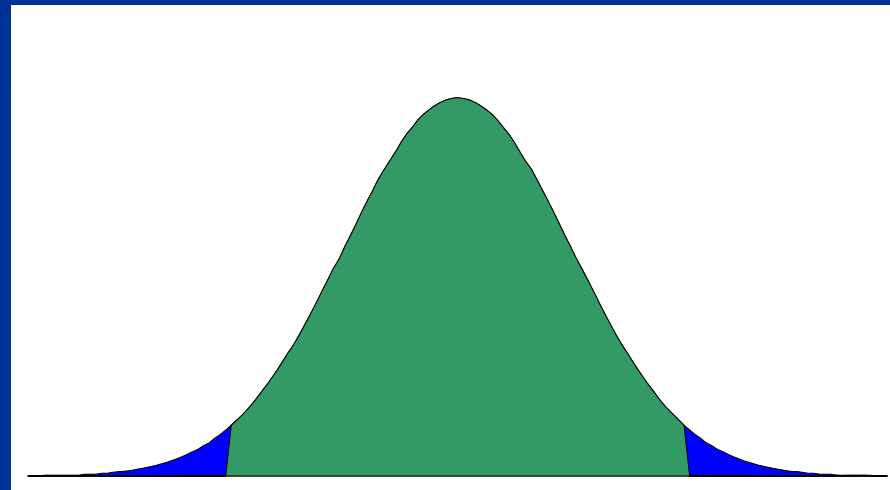
— 15 BPM — 20 BPM — 25 BPM — 30 BPM

Comparison

	Pulse/CF	Concentrator + Pulse Portable	Home Filling Systems	Concentrator + Cylinders
Portable Weight	18 lbs	10 lbs	5-8 lbs	5-8 lbs
Portable Time	4.3 hrs	1-8 hrs	4-8 hrs	4-8hrs
Trip Time	Unlimited*	Unlimited*	4-8 hrs	4-8 hrs
Overnight travel?	Yes	Yes	Yes	Yes
Overnight travel with CPAP?	Yes	No	Yes	Yes
Continuous flow available when away from home?	Yes	No	Yes	Yes
Average Power	70 watts	350 watts	600 watts	330 watts
Provider O2 Delivery \$	\$0	\$0	\$0	\$1,200/yr

Flow/Dose Options Meet Patient Needs

Dose Need Changes with Activity



Low Dose oxygen need

High Dose Oxygen need



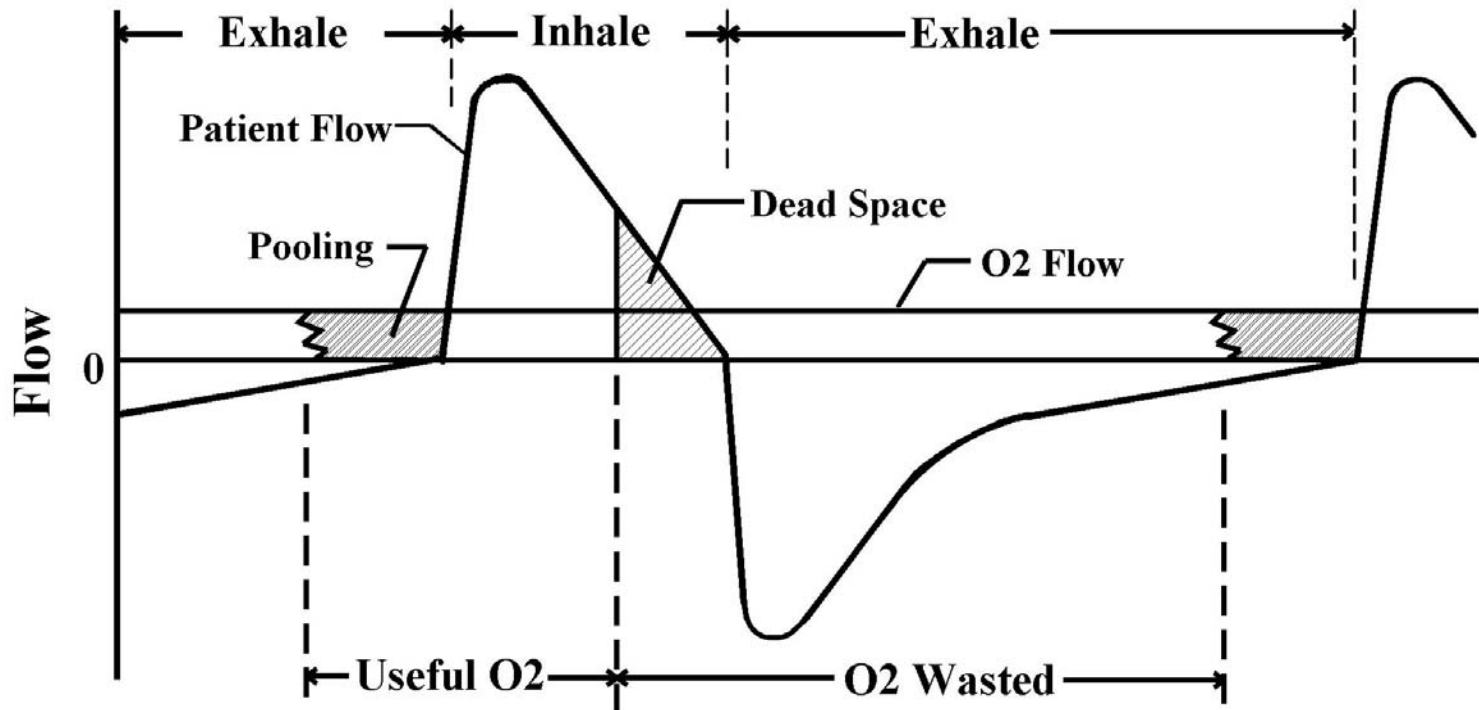
Concentrator Filling Portable

Non-Delivery Systems

- No delivery costs or scheduling
- Issues
 - Fill times
 - Use times
 - Oxygen purity
 - OCD/ dose capability
 - Electricity

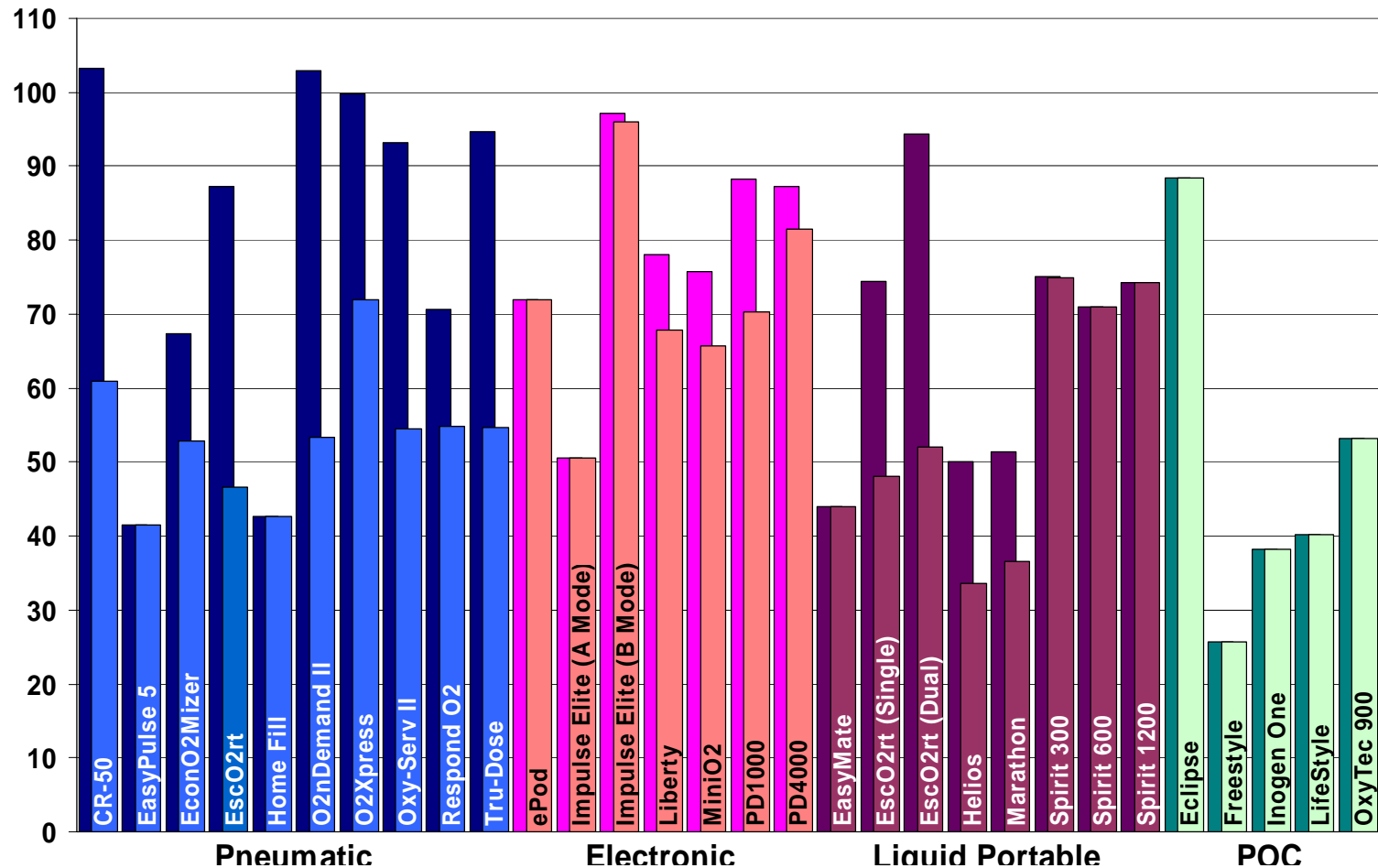


Oxygen Delivery Fundamentals

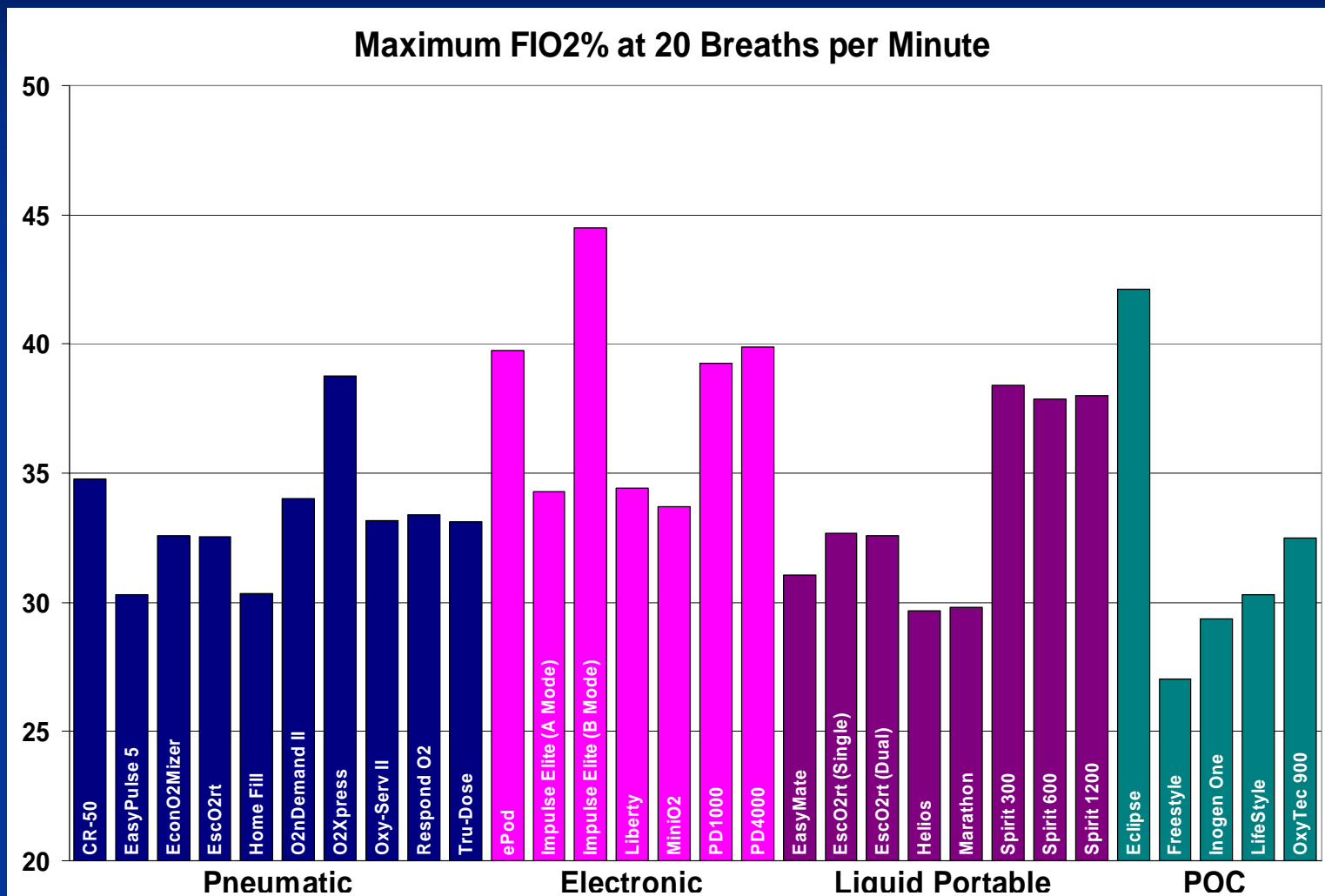


Full Dose vs. Useful Dose

Maximum Total Dose & Maximum "Useful" Dose (mL)- 20BPM



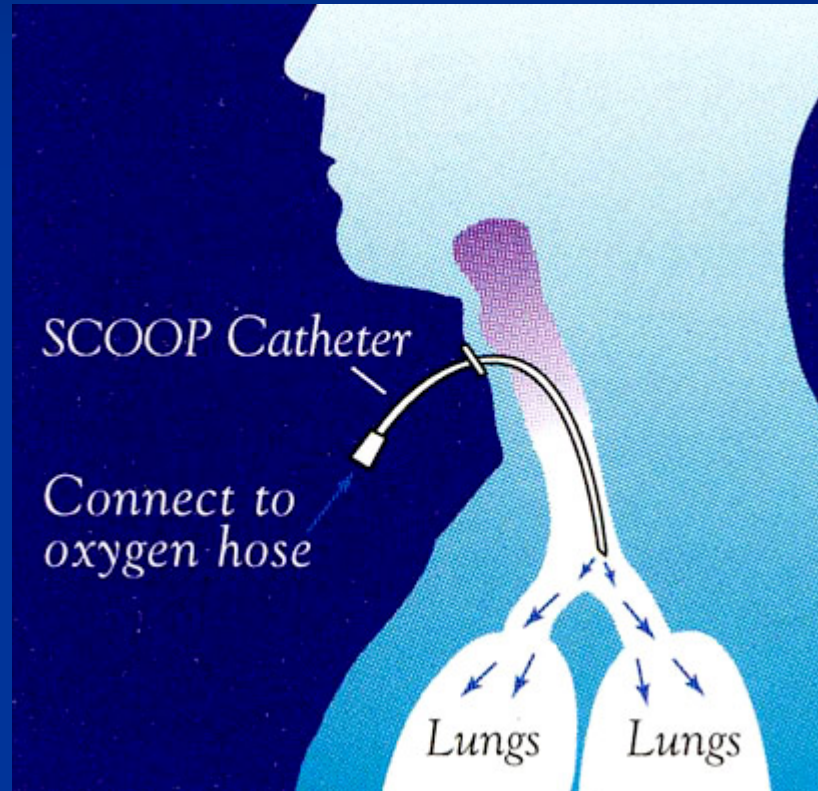
Maximum FiO2



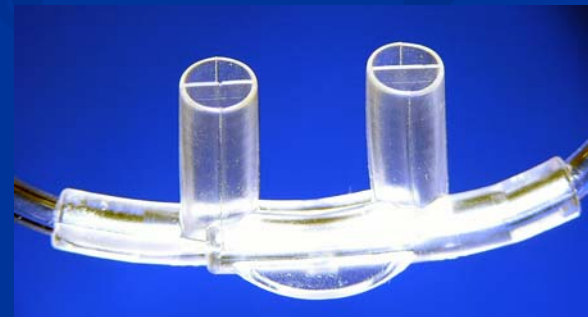
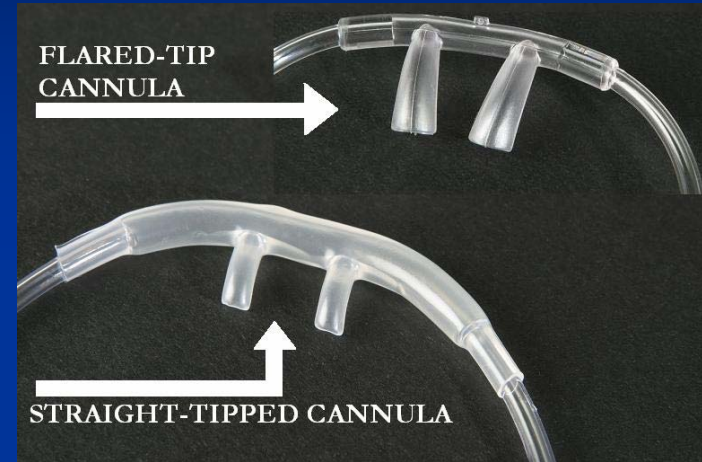
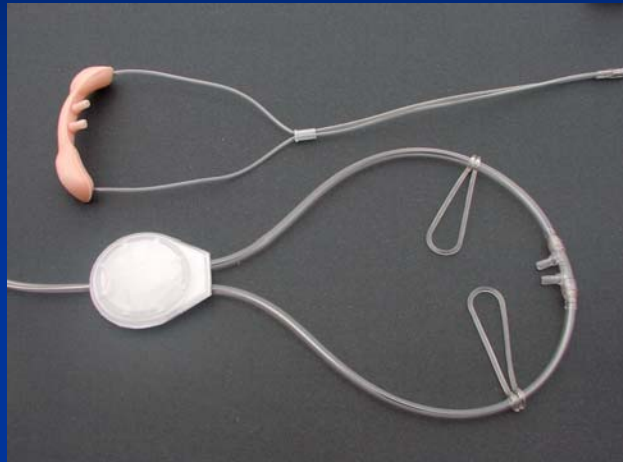
Pulse Dose Measuring Device



New (old) Delivery Concepts

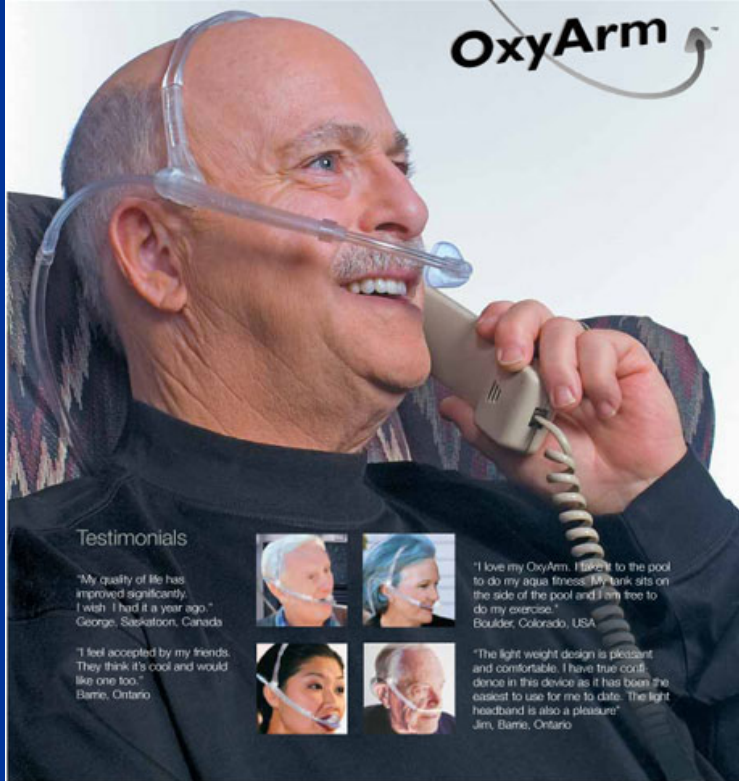


New Oxygen Interface



Patient Comfort

DELIVERING FREEDOM



OxyArm

Testimonials

"My quality of life has improved significantly. I wish I had it a year ago."
George, Saskatoon, Canada



"I feel accepted by my friends. They think it's cool and would like one too."
Barrie, Ontario


"I love my OxyArm. I went to the pool to do my aqua fitness. My tank sits on the side of the pool and I am free to do my exercise."
Boulder, Colorado, USA

"The light weight design is pleasant and comfortable. I have true confidence in this device as it has been the easiest to use for me to date. The light headband is also a pleasure."
Jim, Barrie, Ontario

A PARADIGM SHIFT IN OXYGEN THERAPY

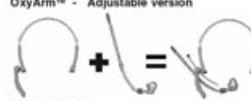
OXYARM DELIVERS FREEDOM

<p>Diffuser Flow Rates</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Oxygen Flow Settings</th> <th>Approximate O₂ Concentrations</th> </tr> </thead> <tbody> <tr><td>1 LPM</td><td>24% - 27%</td></tr> <tr><td>2 LPM</td><td>26% - 31%</td></tr> <tr><td>4 LPM</td><td>32% - 35%</td></tr> <tr><td>6 LPM</td><td>36% - 39%</td></tr> <tr><td>8 LPM</td><td>40% - 43%</td></tr> <tr><td>10 LPM</td><td>42% - 47%</td></tr> <tr><td>12-15 LPM</td><td>48% - 50%</td></tr> </tbody> </table> <p>OxyCannula Flow Rates</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Oxygen Flow Settings</th> <th>Flow Rate</th> </tr> </thead> <tbody> <tr> <td>0-8 LPM</td> <td>0-8 LPM</td> </tr> </tbody> </table>	Oxygen Flow Settings	Approximate O ₂ Concentrations	1 LPM	24% - 27%	2 LPM	26% - 31%	4 LPM	32% - 35%	6 LPM	36% - 39%	8 LPM	40% - 43%	10 LPM	42% - 47%	12-15 LPM	48% - 50%	Oxygen Flow Settings	Flow Rate	0-8 LPM	0-8 LPM	 <p>Diffuser Arm O₂</p>  <p>OxyCannula</p>	<ul style="list-style-type: none"> • Adapts for left or right sided positioning • Minimal contact design - no facial contact • Designed for both nose & mouth breathers • Relief from nasal irritation • Appealing design - high tech, sleek and light weight • Latex-free construction • Delivers freedom
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


Product Codes
 OA-PLUS-1125
 OA-PLUS-1125-8 (7ft tubing)
 OA-PLUS-2025 (RTM)


OxyArm™ - Adjustable version



Product Codes
 OA-HB-1125 OA-DA-1025
 OA-HB-1100 OA-DA-1006




2cm
(3/4")




Product Codes
 OA-PLUS-3125
 OA-PLUS-3125-8

OxyArm™ - Adjustable version




Product Codes
 OA-HB-1125 OA-DA-3025
 OA-HB-1100 OA-DA-3006



OxyArm™
Patented Technology
An OxyArm™ Product

The First Open Oxygen System

The Science - Predictable Oxygen Delivery
 The Innovation - Directional Diffuser Technology
 The Results - Open Oxygen Systems

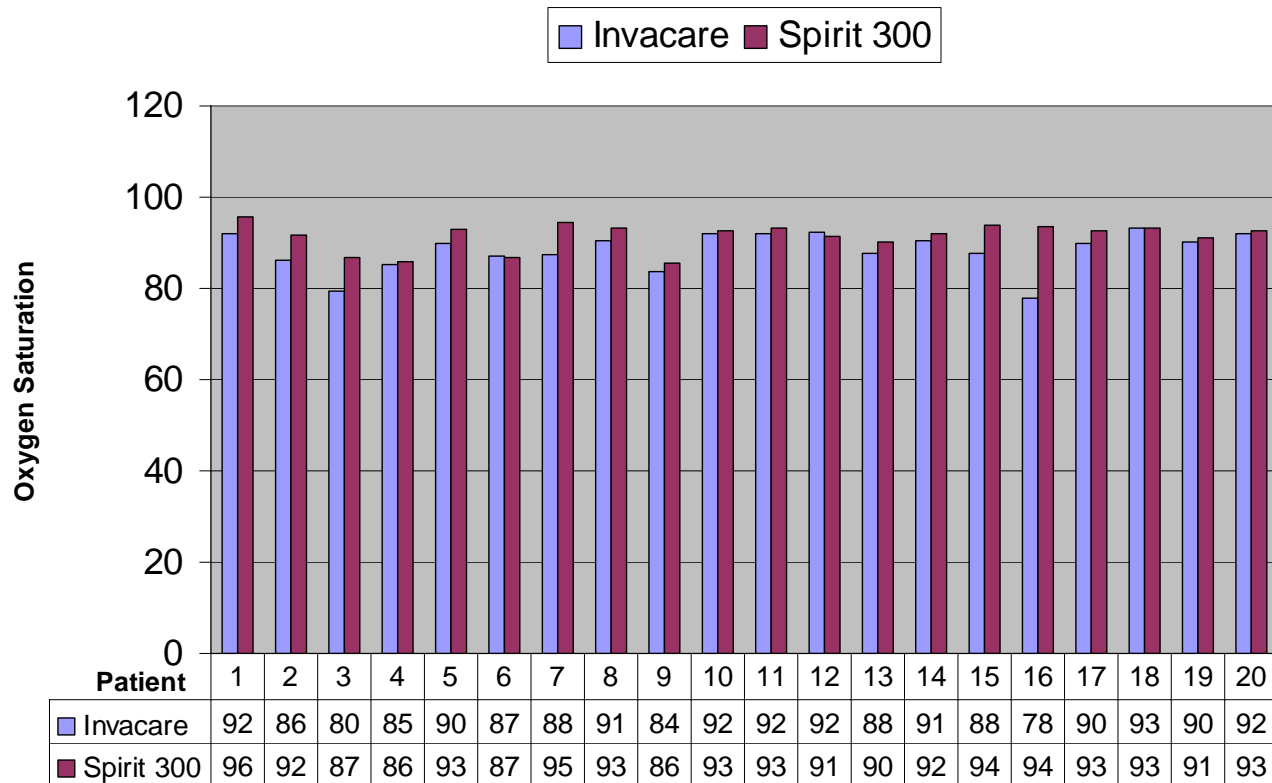


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Oxygen Delivery with Exercise

Average Blood Oxygen Saturation over 10 exercias periods



Oxygen Delivery with Sleep

- Standard practice was to increase oxygen dose for sleep
 - Prior to OSA testing
 - Not consistently applied
- Most patients do not have overnight oximetry prior to 24 hour oxygen therapy
- Sleeping with an OCD under scrutiny

Stationary (heavy) Concentrators

- Work horse of the industry
- Assumed they all work the same
- Impact on therapy?
 - Purity
 - Impact of length of tubing

	Oxygen Purity at Various Device Settings				
	1 LPM	2 LPM	3 LPM	4 LPM	5 LPM
A	94.7	94.4	94.8	95.2	95.5
B	94.0	94.4	94.5	95.0	95.4
C	91.3	91.1	91.4	93.4	95.0
D	91.3	91.3	92.8	95.0	95.1
E	94.3	94.1	94.2	94.6	95.2
F	94.1	93.9	94.5	94.9	95.2
G	93.4	93.5	93.6	94.7	95.3
H	94.2	94.0	94.4	94.5	94.7
I	93.4	94.3	94.5	94.5	94.0
J	94.8	94.6	93.6		
K	92.6	93.6	94.4	95.2	95.3
L	94.3	94.4	94.7	95.0	95.2

POC Sleep Study Demographics

Patient	Age	Gender	Diagnosis	AHI	Years on Oxygen
1	73	M	Emphysema	1.0	3
2	65	F	Emphysema	2.6	6
3	58	M	Pulmonary Fibrosis	0.8	3
4	73	M	Emphysema	9.0	3
5	77	M	Emphysema	4.4	.4
6	71	F	Emphysema	5.0	6
7	74	F	Emphysema	5.0	2.5
8	76	F	Emphysema	3.8	7
9	72	F	Emphysema	Not Available	1.5
10	64	F	Emphysema	1.6	5

Results

Patient	CF	PDOC Sensitivity	PDOC	Hours of data collection		Mean SpO ₂ (%)			Mean HR (beats/min)		
				CF	PDOC	CF	PDOC	Δ	CF	PDOC	Δ
1	0.75	S	1	7.4	9.2	94.0	93.2	-0.8	75	73.4	-1.6
2	2	S	3	7.1	6.6	96.0	95.8	-0.2	89.6	89.8	0.2
3	2	D	5	8.1	9.0	90.1	90.3	0.2	74.1	82.7	8.6
4	3	S	3	9.5	9.0	97.5	96.1	-1.4	79.7	69.6	-10.1
5	2	S	2	7.2	8.6	96.9	94.6	-2.3	64.3	63.9	-0.4
6	2	S	3	7.2	9.6	96.5	97.2	0.7	64.3	69.6	5.3
7	2	S	3	6.6	6.6	97.2	93.3	-3.9	69.3	69.6	0.3
8	2	D	2.5	7.2	9.0	96.9	86.3	-10.6	79.9	84.3	4.4
9	2	S	3.5	5.1	7.2	96.5	94.0	-2.5	80	80.5	0.5
10	2.5	D	3	5.6	6.5	95.0	91.6	-3.4	97	96.0	-1.0
			Mean	7.1	8.1	95.7	93.2	-2.4	77.3	77.9	0.6
			SD								
				1.2	1.2	2.2	3.2	3.3	10.4	10.3	5.0

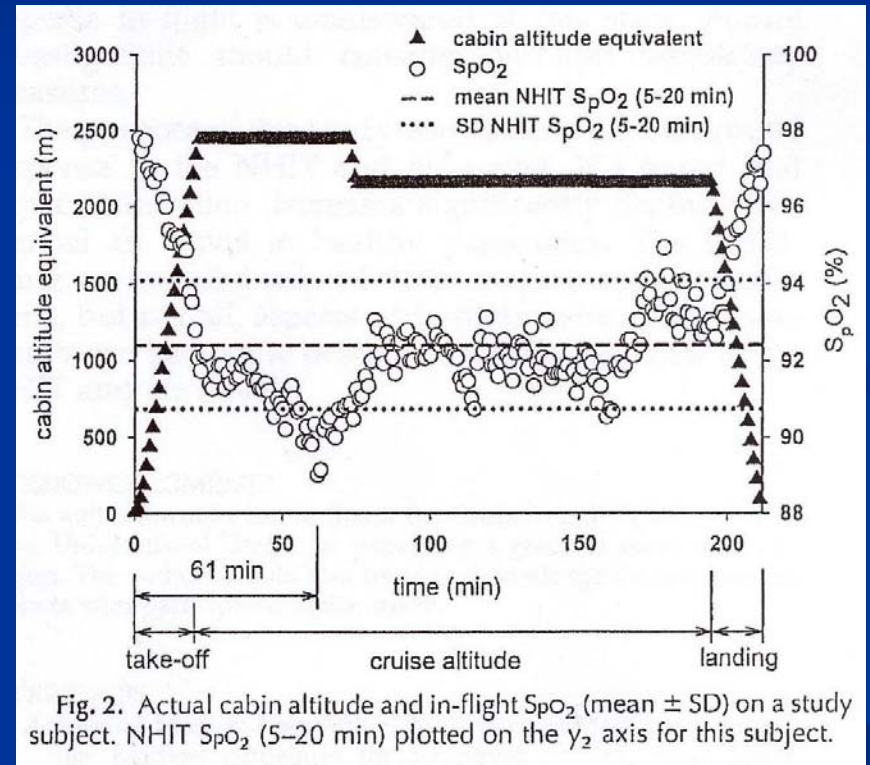
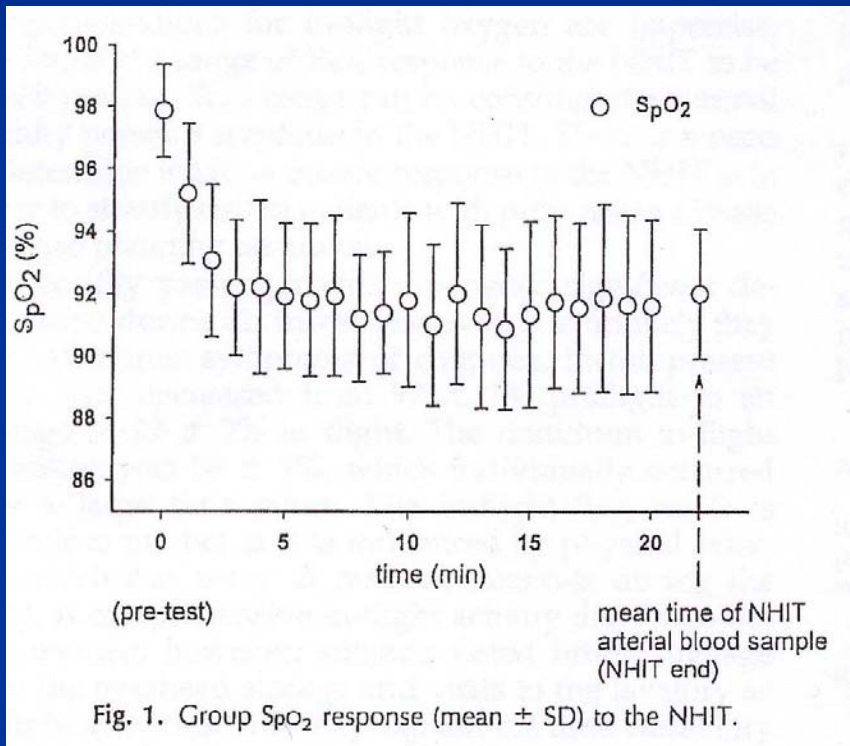
Altitude Adventure

The Altitude Adventurers at the El Rancho Restaurant

Elevation: 7,500 feet above sea level



Oxygen Delivery at Altitude



Patient Monitoring



LTOT Outcomes

- Equipment orientation
 - Revenue higher than expense
 - Increase volume
- Therapy orientated
 - Maintain oxygen saturations at all activity levels
 - Encourage patient to be as active as possible

Planned Research

- NIH COPD study
- This *will* be a huge study, with 14 sites and a target recruitment of roughly 3500 subjects. The goal is to give half of them full-time oxygen (stationary and portable)...

Who is Driving LTOT?



LTOT Drivers

- Oxygen payers - most influential short term
- Oxygen patients - first to realize the impact of LTOT economics
- Oxygen prescribers - get an ear full from patients
- Politicians - a cause to respond to
- Oxygen basics - where does it all start?

Future of LTOT



Future of LTOT

- When all the dust settles what will be left?
 - Diseases that require LTOT
 - Patients that need solutions
 - The need for standards, protocols, guidelines or other support that defines the need, the benefit, the outcomes and the overall good of LTOT.
 - A medical basis for LTOT

Thank You!