

Care by Design

Fisher & Paykel Healthcare Investor Day
Sydney, October 2017

Morning Agenda

10:00am	Welcome	Marcus Driller	General Manager Corporate	
10:00am	Sustainable Profitable Growth	Lewis Gradon	Managing Director & CEO	
10:15am	Patient-focused R&D	Andrew Somervell	VP - Products & Technology	
10:35am	Sales Approach: Enabling Clinical Change	Paul Shearer	Senior VP - Sales & Marketing	 
10:55am	Airvo & Optiflow: World-Leading Technology	Chris Crone	Airvo R&D Manager	 
11:15am	Transforming Respiratory Therapy in Infant Care	Andy Niccol	General Manager - Infant Care	 
11:35am	Nasal High Flow The Brisbane (Paediatric) Experience	Dr Andreas Schibler	Lady Cilento Children's Hospital	
12:00pm - 1:00pm	Lunch Break			

Time will be made available at the end of each presentation specifically for questions and answers.



SUSTAINABLE PROFITABLE GROWTH



CHANGE CLINICAL PRACTICE



BETTER PRODUCTS



GLOBAL REACH

Fisher & Paykel
HEALTHCARE

Afternoon Agenda

1:00pm	Building the body of clinical evidence for myAirvo and Optiflow in the home	Chris Crone	AIRVO R&D Manager	
1:10pm	Nasal high flow humidified air via hospital in the home	Dr Darren Mansfield	Monash Health	
1:30pm	Driving Patient Success with OSA Therapy	Fiona Cresswell	General Manager Marketing	
2:00pm	Management Team Q&A	Lewis Gradon Paul Shearer Tony Barclay Debra Lumsden Andrew Somervell Winston Fong	Managing Director & CEO Senior VP – Sales & Marketing Chief Financial Officer VP – Human Resources VP – Products & Technology VP – Surgical Technologies	
2:25pm	Closing Comments	Lewis Gradon	Managing Director & CEO	
2:30pm – 3:00pm	Product hands-on and further opportunity to speak with FPH team			

Time will be made available at the end of each presentation specifically for questions and answers.



SUSTAINABLE PROFITABLE GROWTH



CHANGE CLINICAL PRACTICE



BETTER PRODUCTS



GLOBAL REACH

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HEALTHCARE

Sustainable Profitable Growth

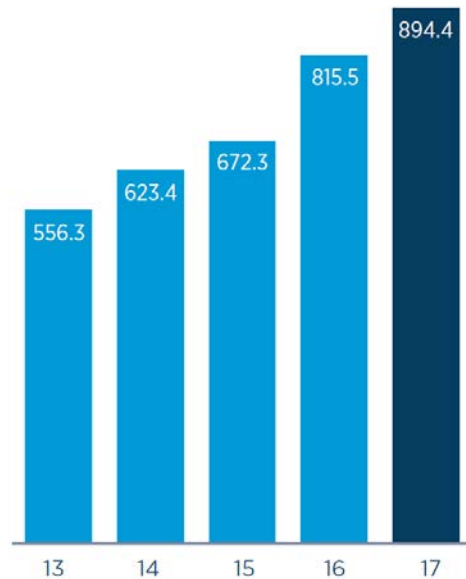
Lewis Gradon
Managing Director & CEO



Question most often asked by investors

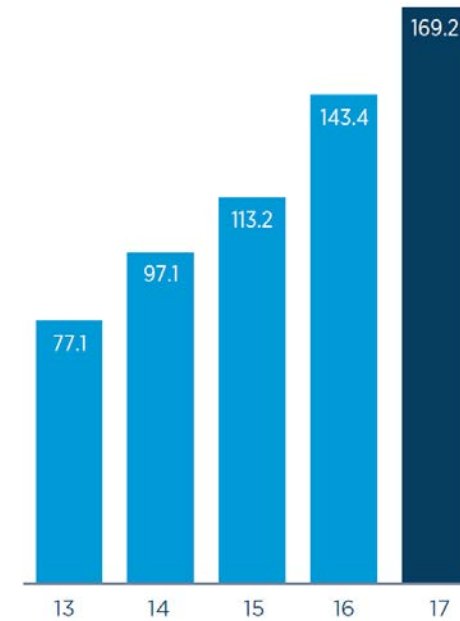
How long can you continue to grow at these kind of rates?

OPERATING REVENUE NZ\$MILLIONS



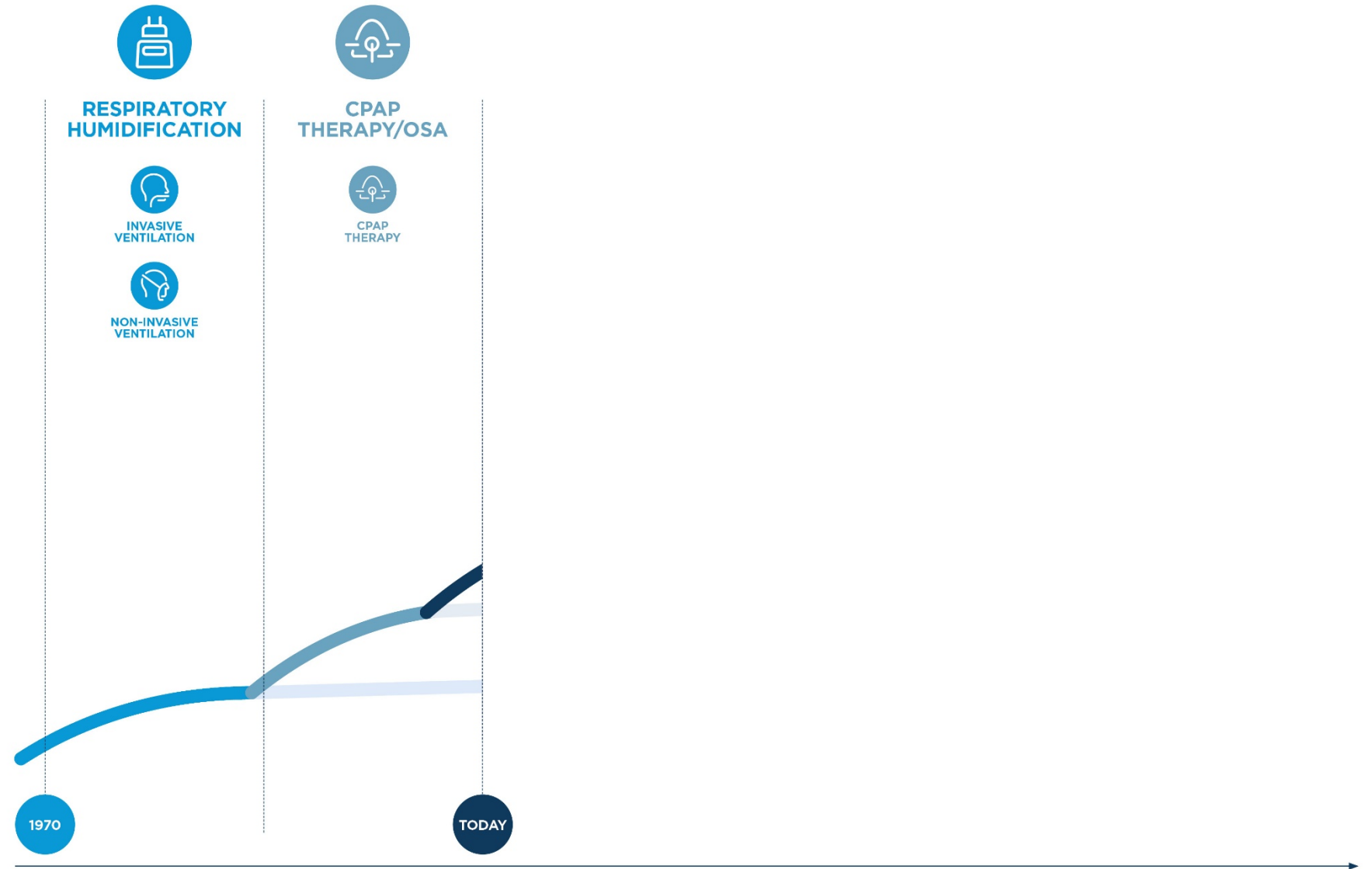
5 YEAR CAGR = 12%

NET PROFIT AFTER TAX NZ\$MILLIONS

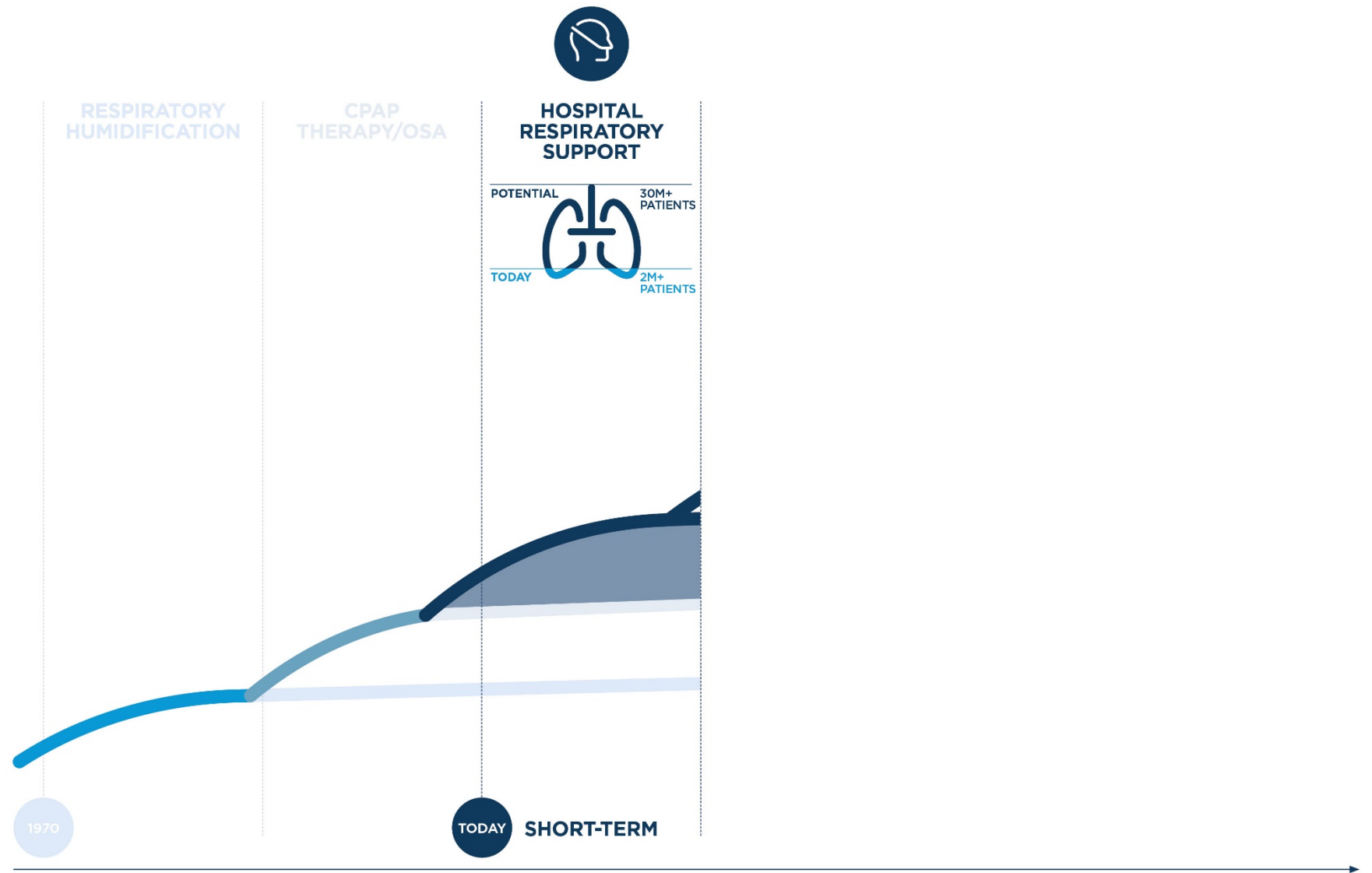


5 YEAR CAGR = 21%

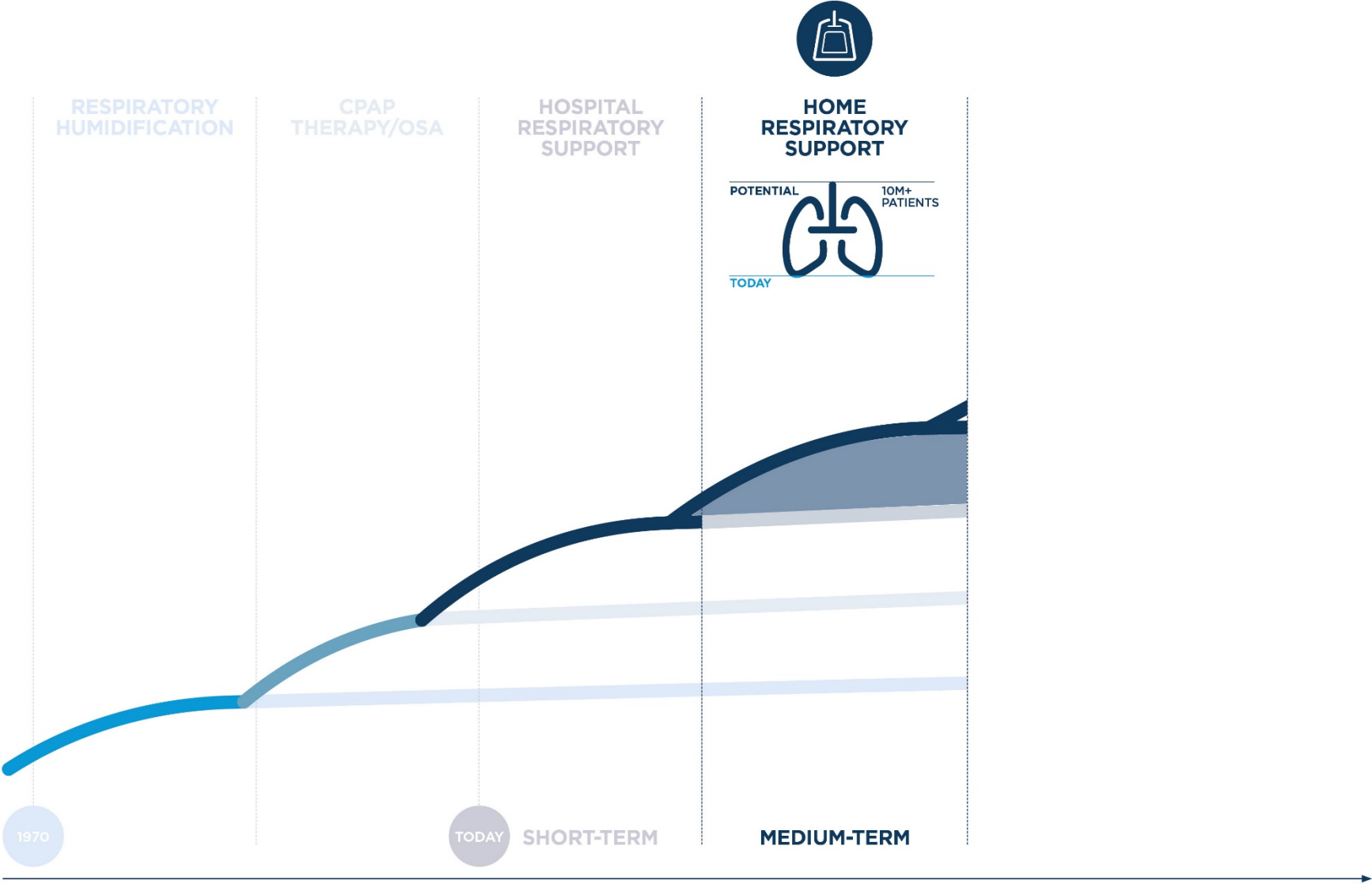
We've established
an enviable
track record
for delivering
**SUSTAINABLE
REVENUE
GROWTH.**



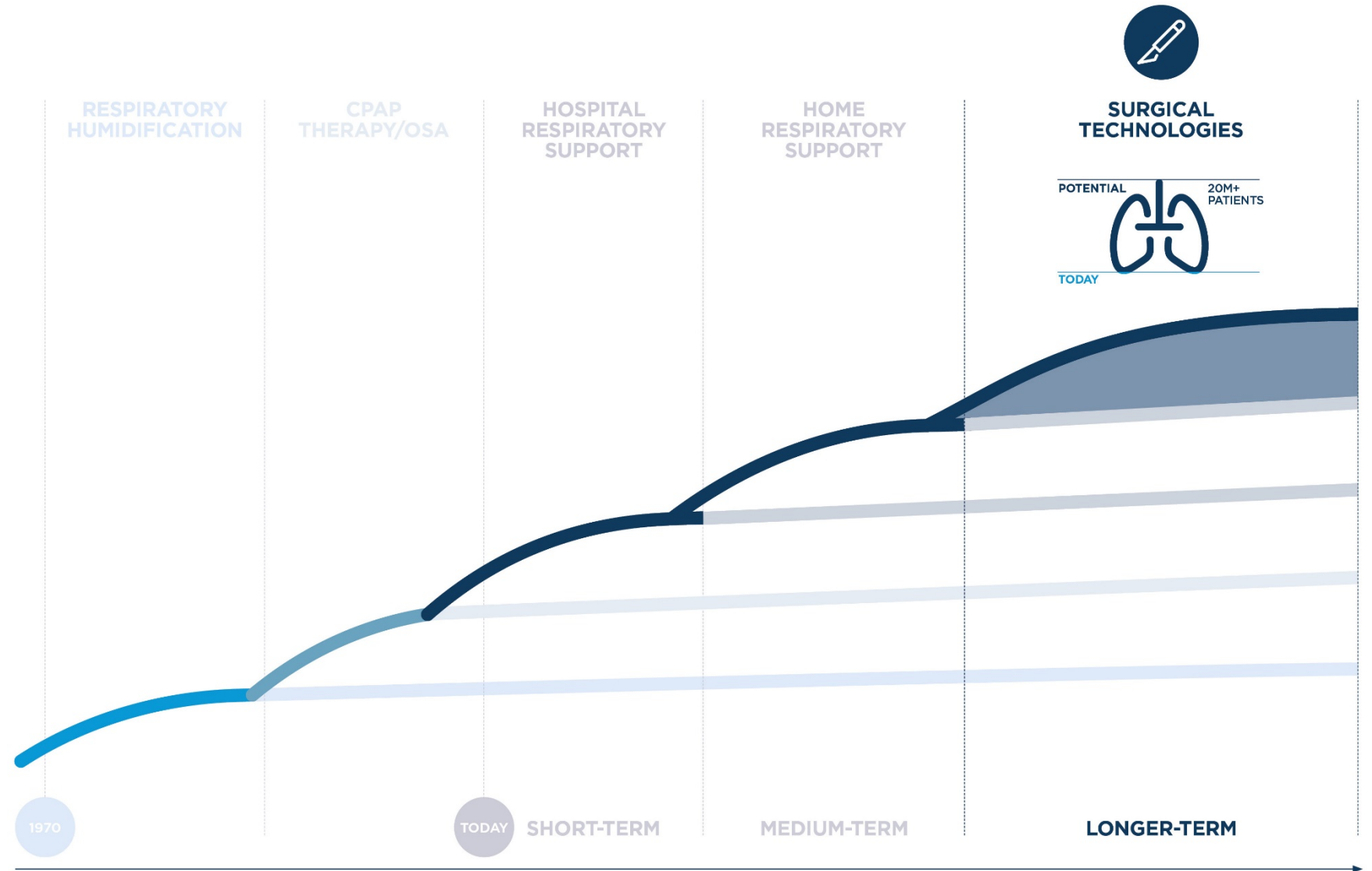
Where will
sustainable
growth come
from in the
SHORT-TERM?



Where will sustainable growth come from in the MEDIUM-TERM?



Where will
sustainable
growth come
from in the
LONGER-TERM?



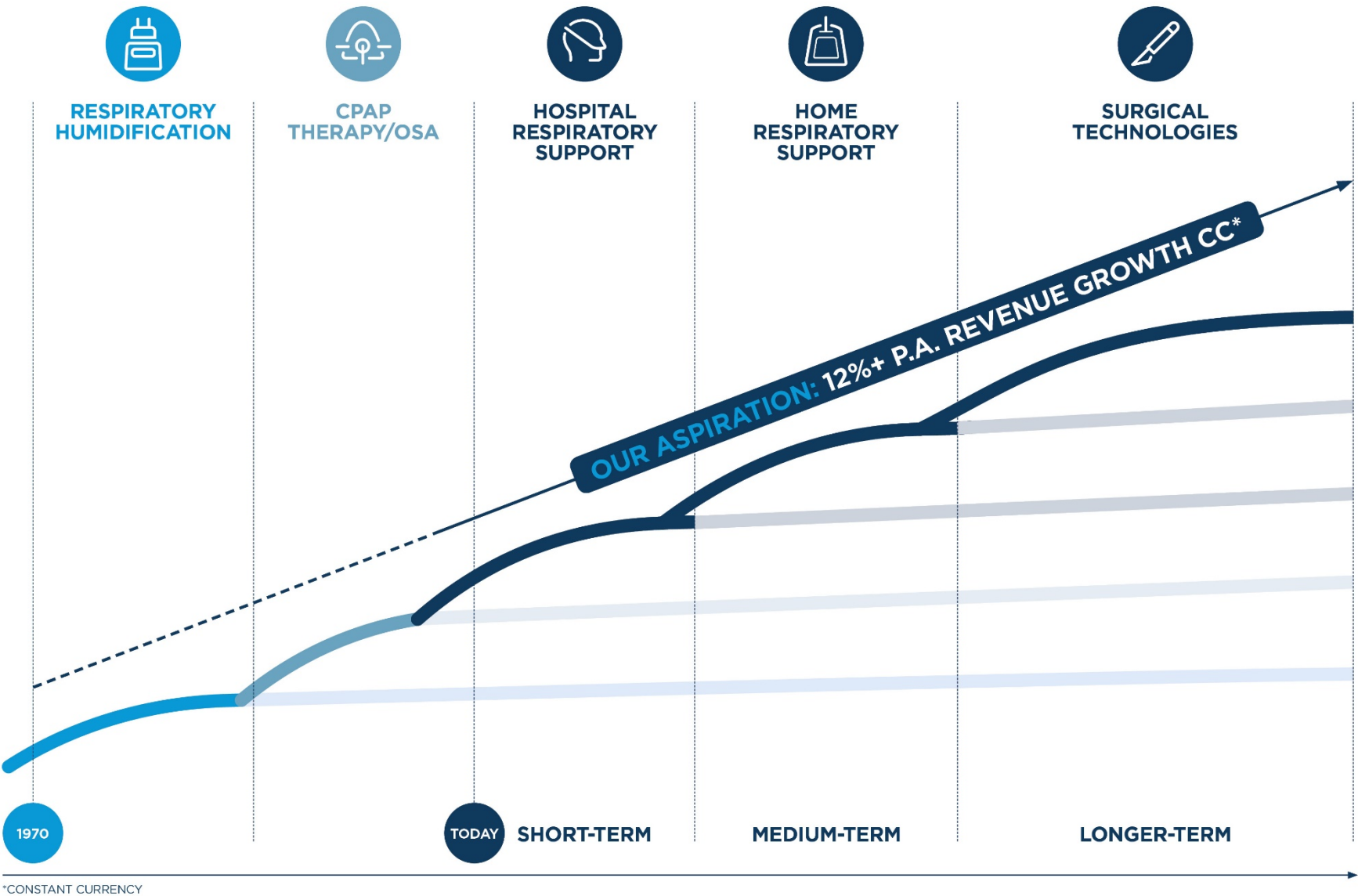
**SURGICAL
TECHNOLOGIES**

POTENTIAL
TODAY



20M+
PATIENTS

OUR ASPIRATION:
Sustainably
DOUBLING
our constant
currency revenue
every 5-6 years.



Characteristics of our business

Market opportunities

- Diverse, growing clinical data
- Underpinned by favourable demographics, aging populations and developing country healthcare spend

Valued customer benefits

- Improved patient outcomes
- Lower cost of care

Independence of economic cycles

- Revenue derived from treating a patient

Barriers to entry

- Regulated
- Patented IP
- Care Continuum: Throughout hospital to home
- Sales force investment
- Knowledge base

Relatively predictable cash generation

- Hardware placement drives per patient consumables
- Successful treatment resists change
- Change of clinical practice inertia



GROWTH PROFITABLY, SUSTAINABLY

Questions?



Patient-focused R&D

Andrew Somervell – Vice President
Products and Technology



Improving Clinical Practice: R&D approach

- Unique products with valued differentiation that:
 - Improve care and outcomes
 - Lower overall cost of treating patients
- Proven innovation history
- Original thought required
- Enabled through understanding unmet patient and caregivers' needs

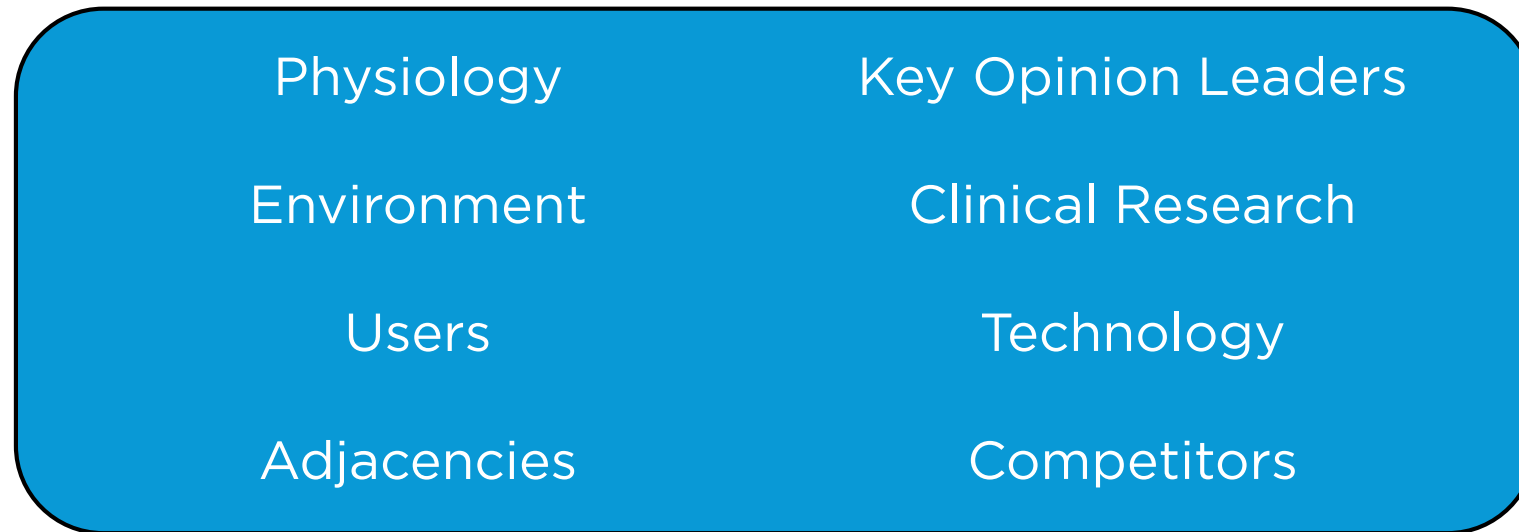


Patient Oriented R&D

- Philosophy of doing what's best for the patient
 - Needs of all stakeholders align with patient needs
 - Encourages long term thinking
 - Ingrained in FPH culture
- Patient focused multi-disciplinary product teams
 - Specialist skills, broad knowledge



Patient Focused Teams: In-depth Knowledge



NEW IDEAS, ORIGINAL THOUGHT

Enabling our Product Teams

- Easy access to the user environment:
 - Strong relationships with local and offshore hospitals and homecare dealers
 - Patient knowledge, testing solutions
- Learning by creating
 - Prototype, test, learn
 - World-class prototyping and testing facilities
- Access to world-leading technology experts
- R&D access to manufacturing
- Proven ability to attract and grow top talent



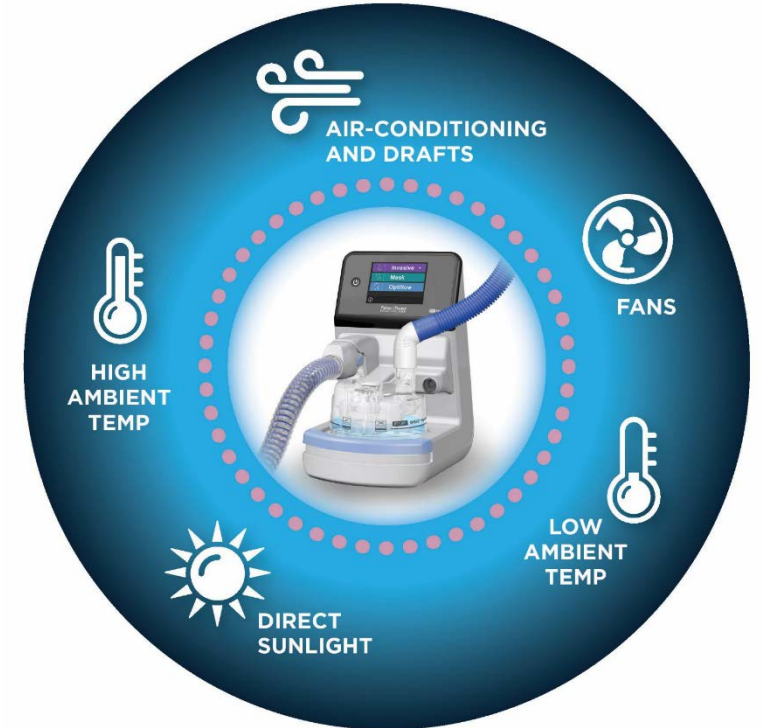
F&P 950: Redefining Expectations

- F&P 850 current market leader



AirSpiral Inspiratory Limb

- Opportunity:
 - Optimal humidity, minimal condensation in difficult ambient conditions
- Benefits:
 - Reduce ventilation breaks
 - Reduce infection risk
 - Reduce clinician's time dealing with condensate
- Idea:
 - Insulate delivered medical gas with pockets of air
- Result:
 - AirSpiral Tube
- Technical challenge
 - How to manufacture
- Conceived for 950, adapted for Airvo and SleepStyle



A photograph of three people in a laboratory or workshop setting. On the left, a woman with dark hair in a bun and safety glasses stands with her arms crossed, looking at a device on a table. In the center, a man with short dark hair and safety glasses is leaning over the table, working on the device. On the right, a woman with blonde hair in a ponytail and safety glasses is also leaning over the table, working on the device. The table has a green surface and various tools and equipment. In the background, there are shelves with various items and a large piece of equipment with a screen. The word "Questions?" is overlaid on the left side of the image.

Questions?

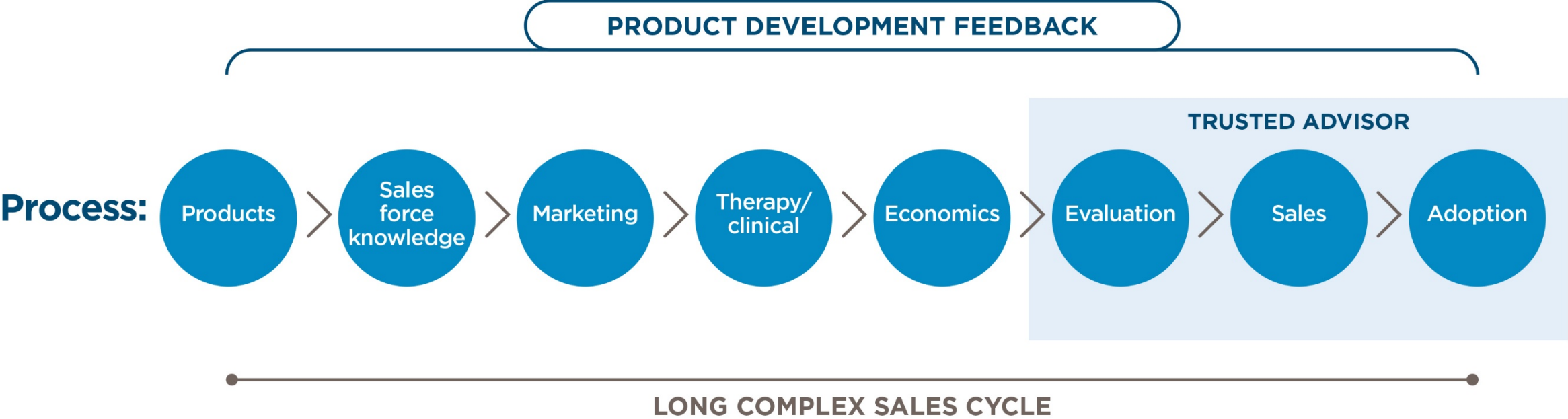


Sales approach: enabling clinical change

Paul Shearer
Senior VP – Sales & Marketing



Clinical change process

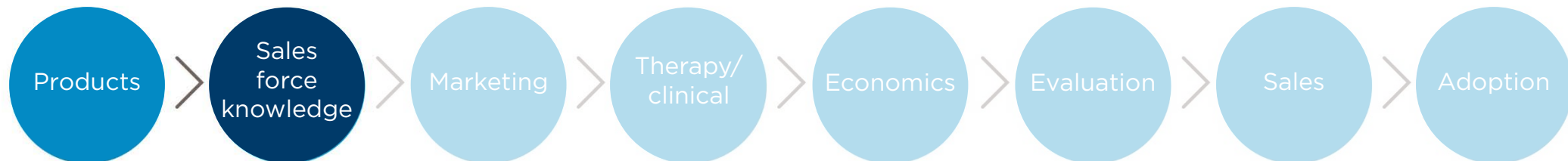


Developing sales team effectiveness

- Product training
- Therapy understanding
- Expert domain knowledge
- Develop customer relationships
- Trusted advisor

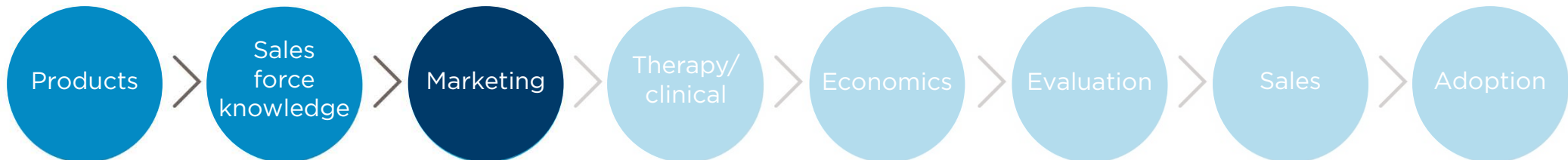


Takes several years for a FPH sales rep to become fully effective



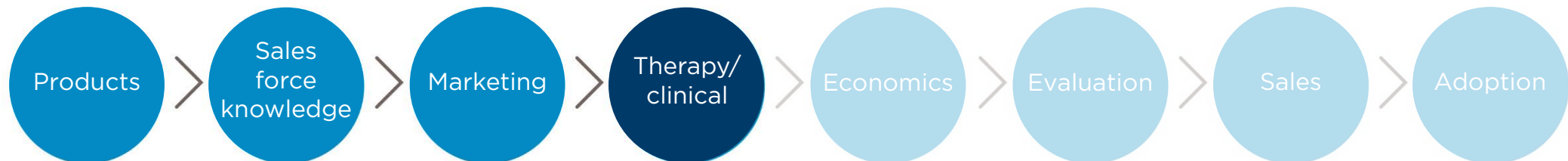
Role of marketing

- Condition market for sales organisation
- Patient group experts
- Develop messaging and approach
- Clinically-focused marketing
- Promote FPH brand
- Product approval and country registrations



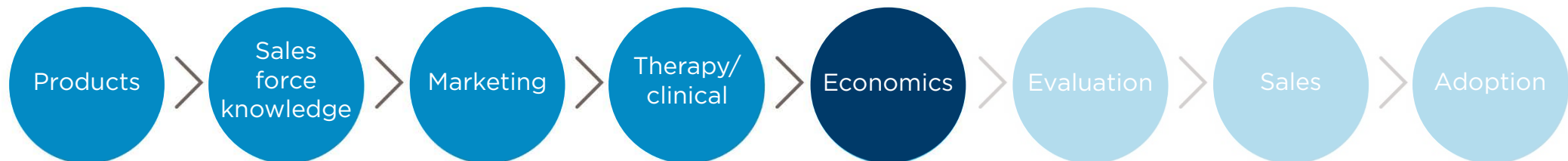
Clinical and therapy validation

- Develop Key Opinion Leaders (KOL relationships)
- Pilot studies
- Physiological studies (Mechanisms)
- Outcome studies (RCT)
- Peer to peer education



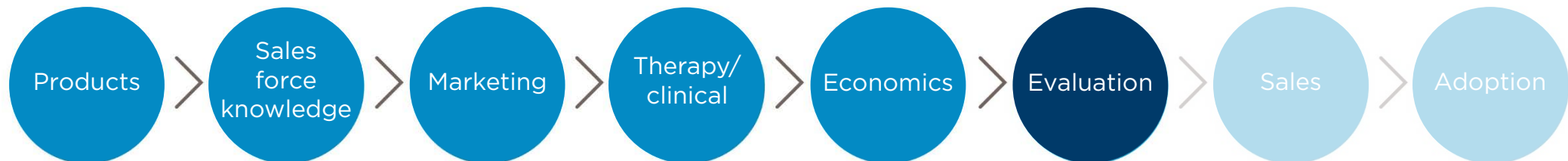
Value-based economics

- Cost calculators
- Translation of clinical evidence to financial benefits
- User case studies
- External financial validation
- Reimbursement / payment pathways



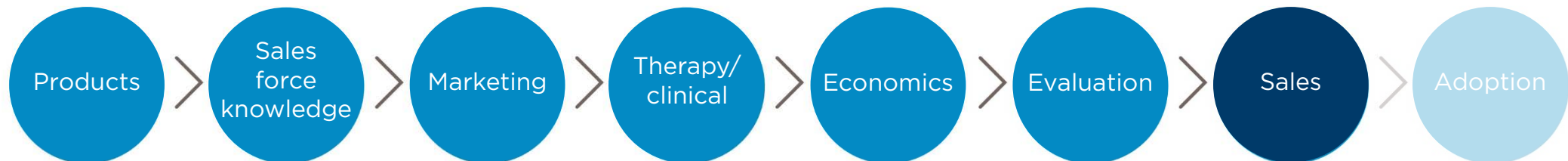
Evaluation

- Customer preparedness
- Evaluation criteria
- Educating clinicians over multiple shifts
- Validating critical success factors
- Trust and confidence



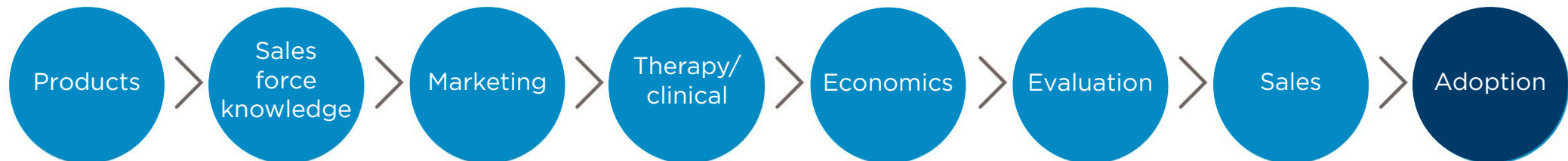
Sales achievement

- Contract (GPO / IDN) formularies
- Win / meet tender specifications
- Capital acquisition (annual cycles)
- Lease / commitment programmes
- Installation / in-service support
- Customer success



Driving adoption

- Facilitate change management
- Customer commitment
- Standard of care
- Physician-generated protocol
- Product performance
- Ongoing review



Customer satisfaction

- Proven product performance ✓
- Improved care and outcomes based on unique FPH product ✓
- Strong relationships and trust ✓
- Product standardisation and continuum of care ✓
- Customer commitment ✓

Enabling clinical change - summary

- Clinical change is a disruptive, lengthy and complex process
- Clinicians:
working with trusted products delivering improved outcomes to at risk patients
are reluctant to change



A close-up photograph of a young child with light skin and blue eyes. The child is wearing a white nasal cannula that is secured to their face with white adhesive tape. The cannula has two thin tubes that go into the nostrils. The child is looking directly at the camera with a neutral expression. They are wearing a light-colored shirt with a small red pattern. The background is a soft, out-of-focus white.

Questions?

Airvo & Optiflow: World-Leading Technology

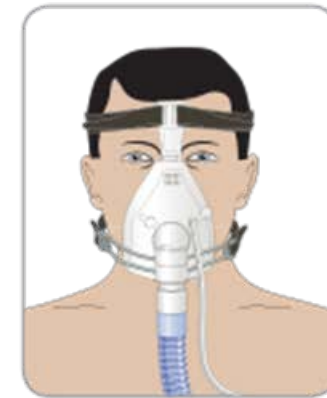
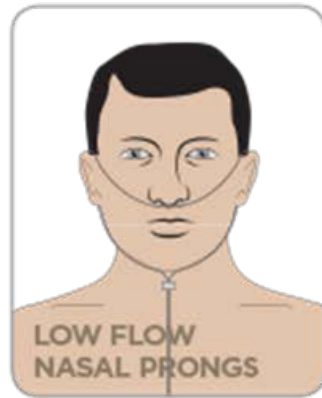
Chris Crone
Research & Development Manager –
Airvo/Optiflow



What is Optiflow nasal high flow therapy?

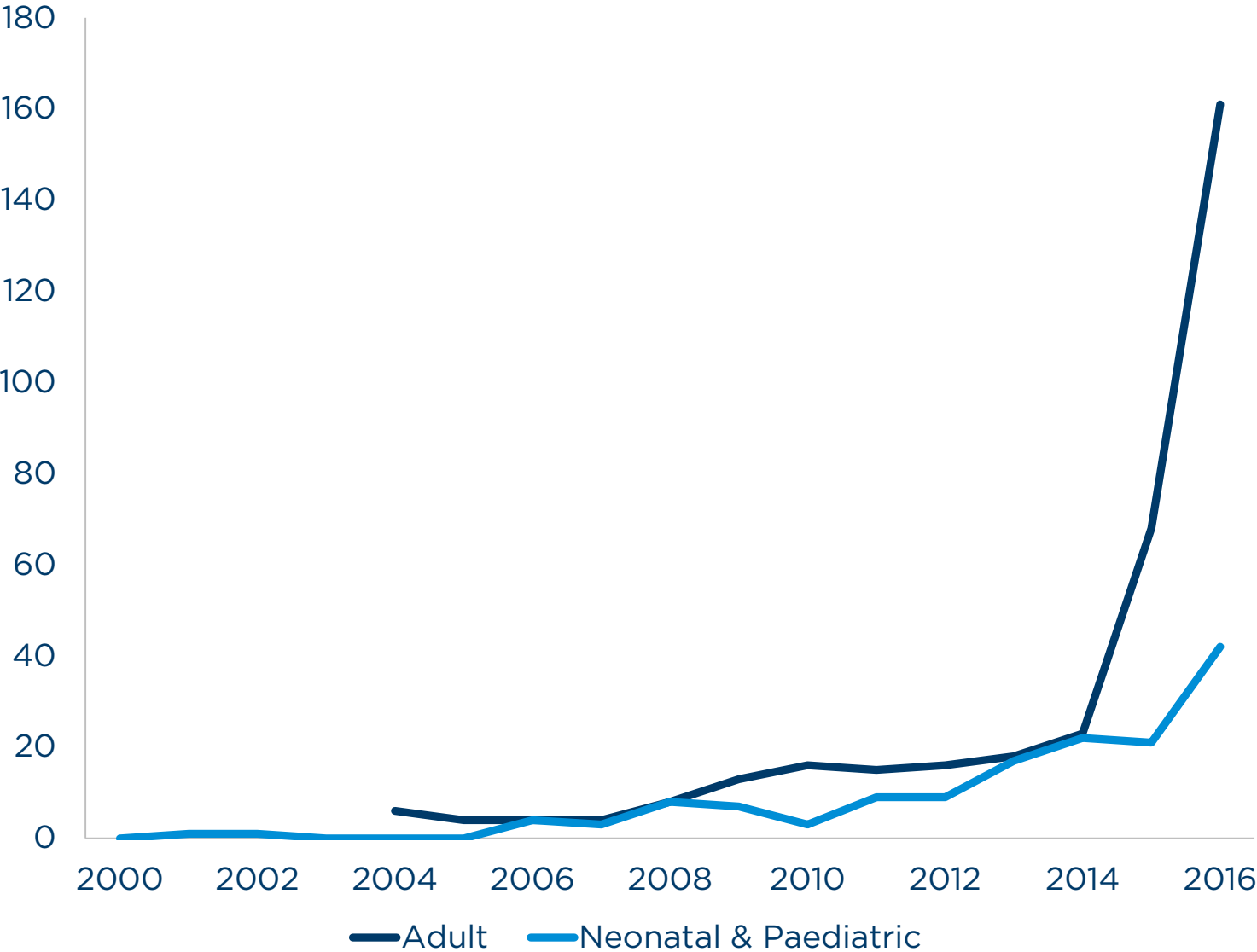
CONVENTIONAL
OXYGEN THERAPY

NON-INVASIVE
VENTILATION



Interest accelerating in Nasal High Flow therapy

**Nasal High Flow
Clinical Papers
Published
Annually**



2014-2015: Breakthrough publications



The NEW ENGLAND
JOURNAL of MEDICINE

ORIGINAL ARTICLE

High-Flow Oxygen through Nasal Cannula
in Acute Hypoxemic Respiratory Failure



AMERICAN JOURNAL OF
Respiratory and
Critical Care Medicine®

ORIGINAL ARTICLE

Nasal High-Flow versus Venturi Mask Oxygen Therapy
after Extubation
Effects on Oxygenation, Comfort, and Clinical Outcome

JAMA The Journal of the
American Medical Association

Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

High-Flow Nasal Oxygen vs Noninvasive Positive Airway
Pressure in Hypoxemic Patients After Cardiothoracic Surgery
A Randomized Clinical Trial



2016: More evidence post-extubation

Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Effect of Postextubation High-Flow Nasal Cannula vs Conventional Oxygen Therapy on Reintubation in Low-Risk Patients A Randomized Clinical Trial

Gonzalo Hernández, MD, PhD; Concepción Vaquero, MD; Paloma González, MD; Carles Subira, MD; Fernando Frutos-Vivar, MD; Gemma Rialp, MD; Cesar Laborda, MD; Laura Colinas, MD; Rafael Cuenca, MD; Rafael Fernández, MD, PhD



Summary

- 7 centres in Spain
- 527 patients at low risk of reintubation
- Optiflow significantly reduced reintubation rates vs O2

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Effect of Postextubation High-Flow Nasal Cannula vs Noninvasive Ventilation on Reintubation and Postextubation Respiratory Failure in High-Risk Patients A Randomized Clinical Trial

Gonzalo Hernández, MD, PhD; Concepción Vaquero, MD; Laura Colinas, MD; Rafael Cuenca, MD; Paloma González, MD; Alfonso Canabal, MD, PhD; Susana Sanchez, MD; Maria Luisa Rodriguez, MD; Ana Villasclaras, MD; Rafael Fernández, MD, PhD



Summary

- 3 centres in Spain
- 604 patients at high risk of reintubation
- Optiflow was non-inferior to NIV

Reintubation is linked with poor outcomes

Emerging evidence in other areas

- Hypercapnic patients
 - Large randomised controlled trials (RCTs) in planning stages (French government support)
- Emergency department
 - Bell, et al. 2015. Emergency Medicine Australasia
 - Makdee, et al. 2017. Annals of Emergency Medicine
- Wards
 - Pirret, et al. 2017. Intensive Critical Care Nursing



Emerging evidence in other areas

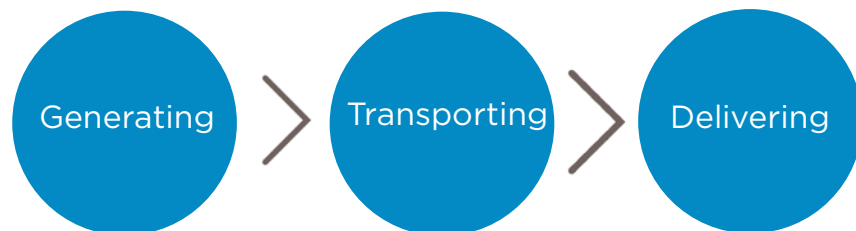
- Evolution in research
 - Different patient groups and settings
 - Larger trials
- Towards:
 - All spontaneously breathing patients requiring respiratory support



FPH technology advantage

For Optiflow Nasal High Flow:

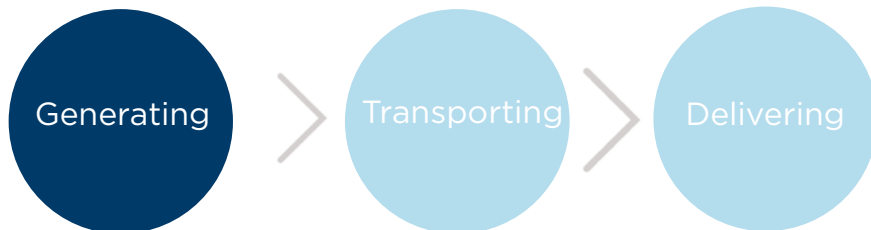
- **Generating** with Airvo
- **Transporting** with AirSpiral
- **Delivering** with Optiflow



Generating with Airvo

Superiority in:

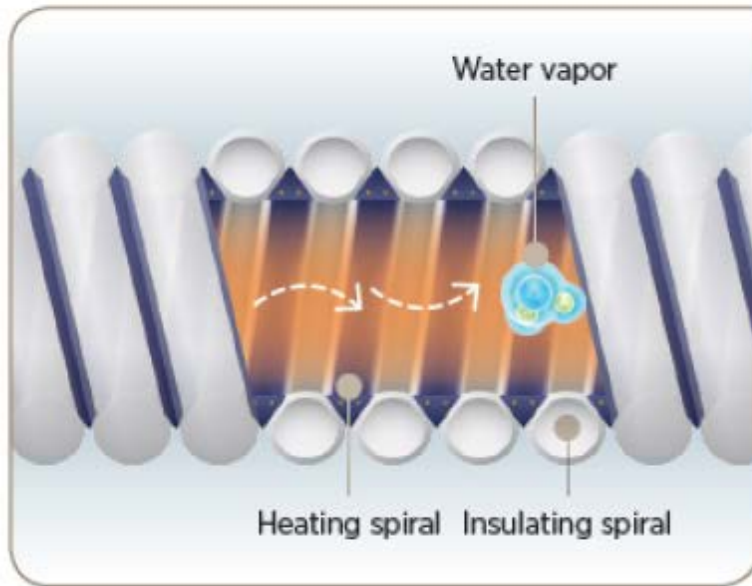
- Performance - humidification, flow, sensing
- Versatility - wide range of temperatures, flows and oxygen
- Mobility - throughout the hospital



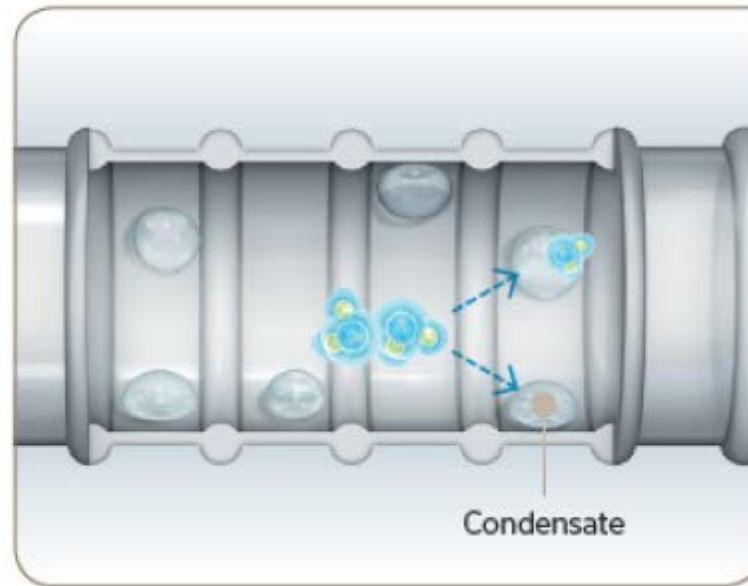
Transporting with AirSpiral

- Superior protection against condensate
- Patents filed on technology and processes

AirSpiral tubes



Conventional breathing tubes



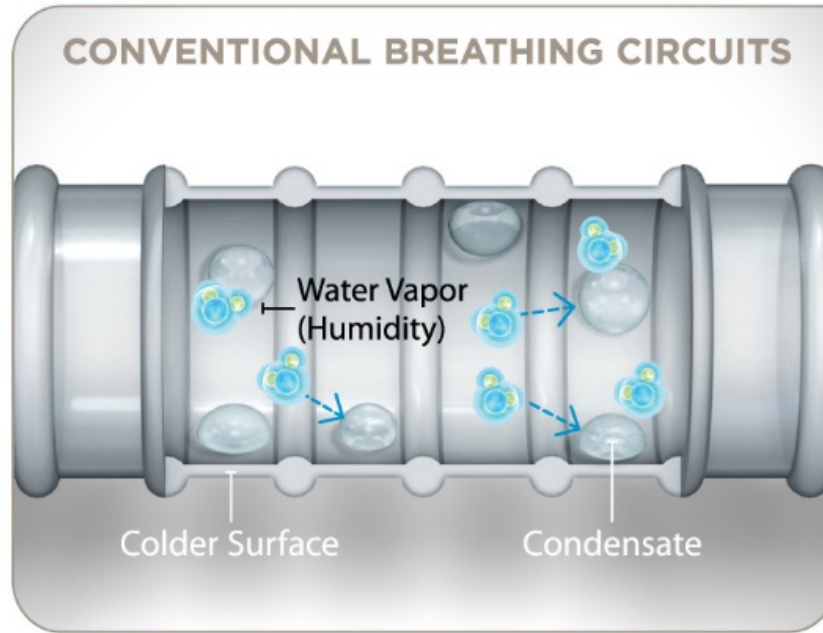
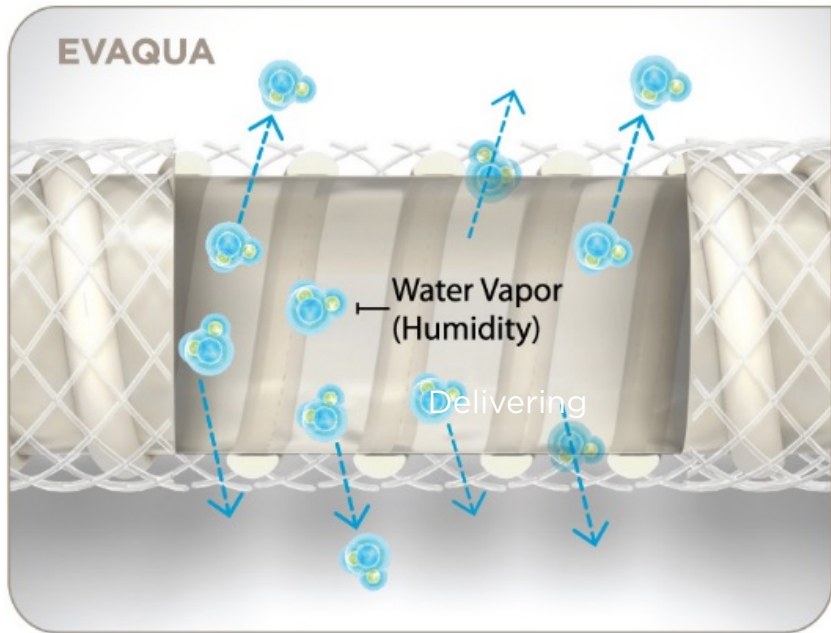
Generating

Transporting

Delivering

Delivering with Optiflow

- The only interface with Evaqua technology
- Reduces formation of mobile condensate
- Comfort for patients and confidence for clinicians



Exciting potential

- Huge clinical interest in Optiflow
- We are well-positioned with Airvo, AirSpiral and Optiflow technologies



Questions?



Transforming Respiratory Therapy in Infant Care

Andy Niccol
General Manager - Infant Care



Infant care continuum



Resuscitation



Invasive
ventilation



nCPAP

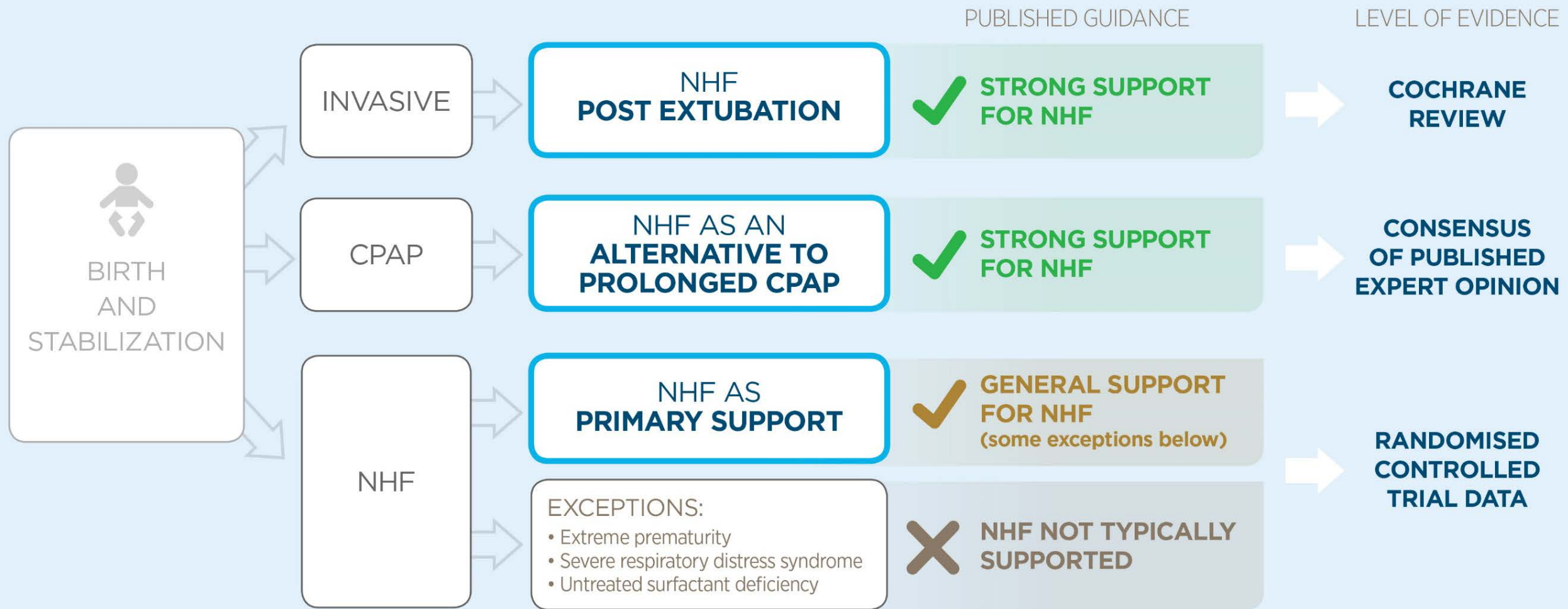


Nasal
high flow



Oxygen
therapy

Current evidence supporting the clinical applications of NHF



1. Manley et al. *N Engl J Med*. 2013. 2. Colins et al. *J Pediatrics*. 2013. 3. Yoder et al. *Pediatrics*. 2013.
4. Roberts et al. *N Engl J Med*. 2016. 5. Lavizzari et al. *JAMA Pediatrics*. 2016. 6. Wilkinson et al. *Cochrane Database Syst Rev*. 2016.
7. Manley et al. *Clinic Perinatol*. 2016. 8. Roberts et al. *Maternal Health Neonatol Perinatol*. 2017.

The next generation of care

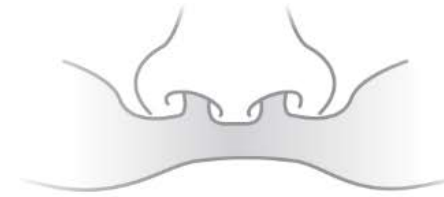


Specifically designed for the delicate anatomy and flow requirements of your smallest patients.

F&P Optiflow™ Junior 2

Fisher & Paykel
HEALTHCARE

Enhanced prong retention



Improves prong stability in the nostrils



Allows for natural facial movement
when patient's cheeks are compressed



Easier readjustment and
maintenance for caregivers

F&P Optiflow™ Junior 2

Enhanced prong retention



Wider range of sizes



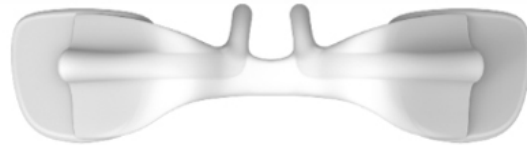
XS



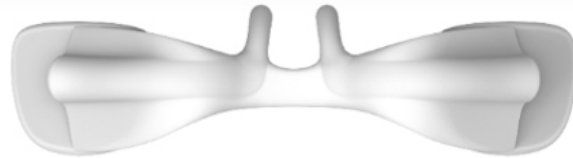
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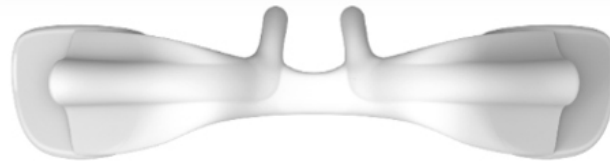
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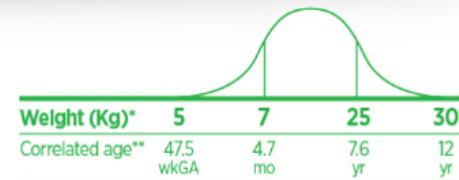
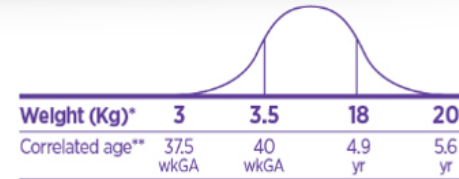
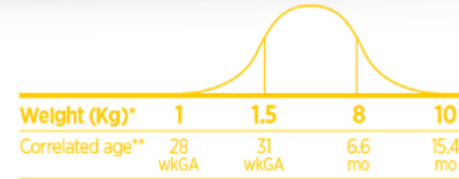
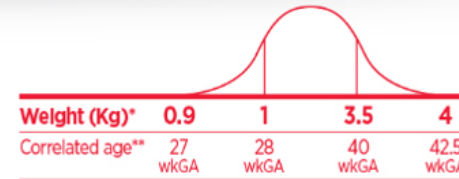
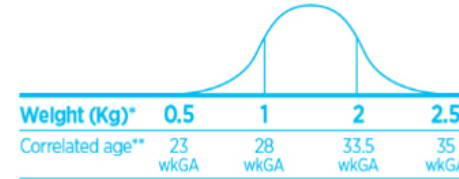


XL



APPROXIMATE AGE AND WEIGHT

Age and weight information should only be used as a guide. Ensure clinical judgement is used when sizing.



wkGA = weeks of gestation; mo = months; yr = years

* Weight data is based on F&P product validation studies.

** Age data is a correlation to weight data based on a combination of Fenton, WHO and CDC growth charts.

Retains existing product benefits



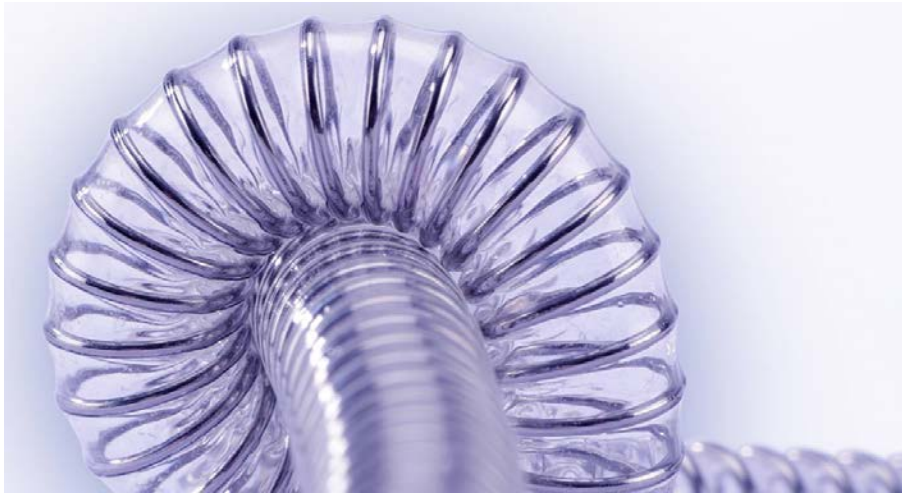
F&P Optiflow™ Junior 2

Fisher & Paykel
HEALTHCARE

Wigglepads



Tube Technology



Questions?



Nasal High Flow

The Brisbane (Paediatric) Experience



Associate Professor Andreas Schibler

Paediatric Intensive Care Staff Specialist FCICM - PICU
Medical Lead of Paediatric Critical Care Research Group (PCCRG)
Lady Cilento Children's Hospital and The University of Queensland



The PCCRG receives an ongoing research grant from Fisher & Paykel Healthcare. Travel expenses associated with this presentation have been covered by Fisher & Paykel Healthcare



A. Schibler
T. M. T. Pham
K. R. Dunster
K. Foster
A. Barlow
K. Gibbons
J. L. Hough

Reduced intubation rates for infants after introduction of high-flow nasal prong oxygen delivery

Table 3 Infants with viral bronchiolitis listed by year

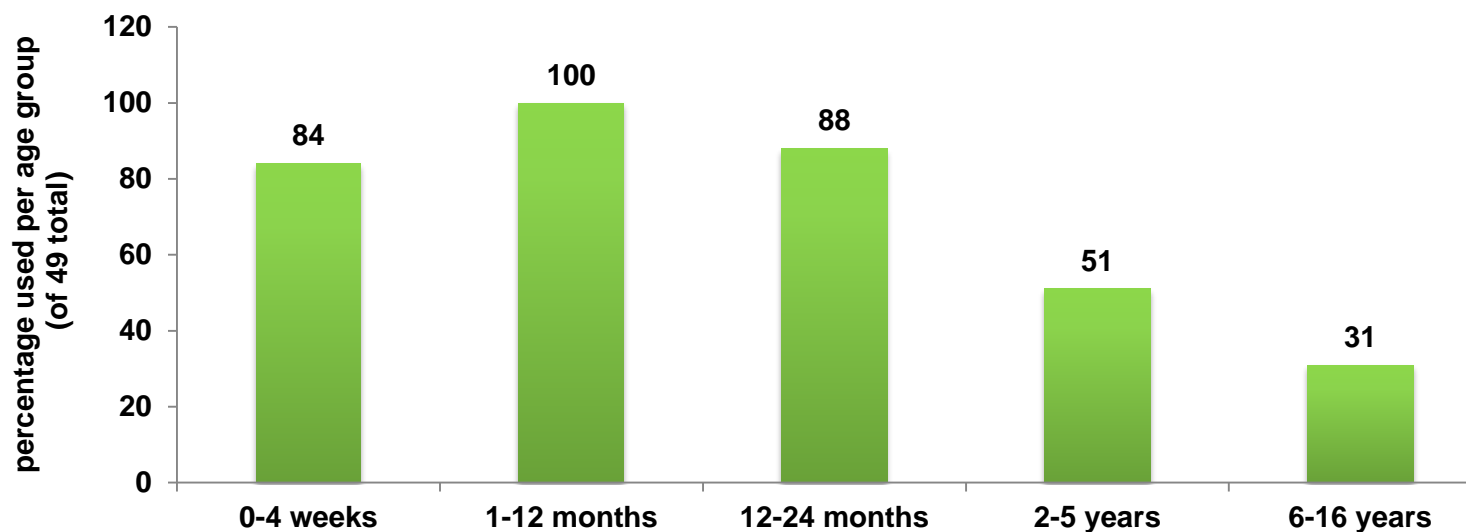
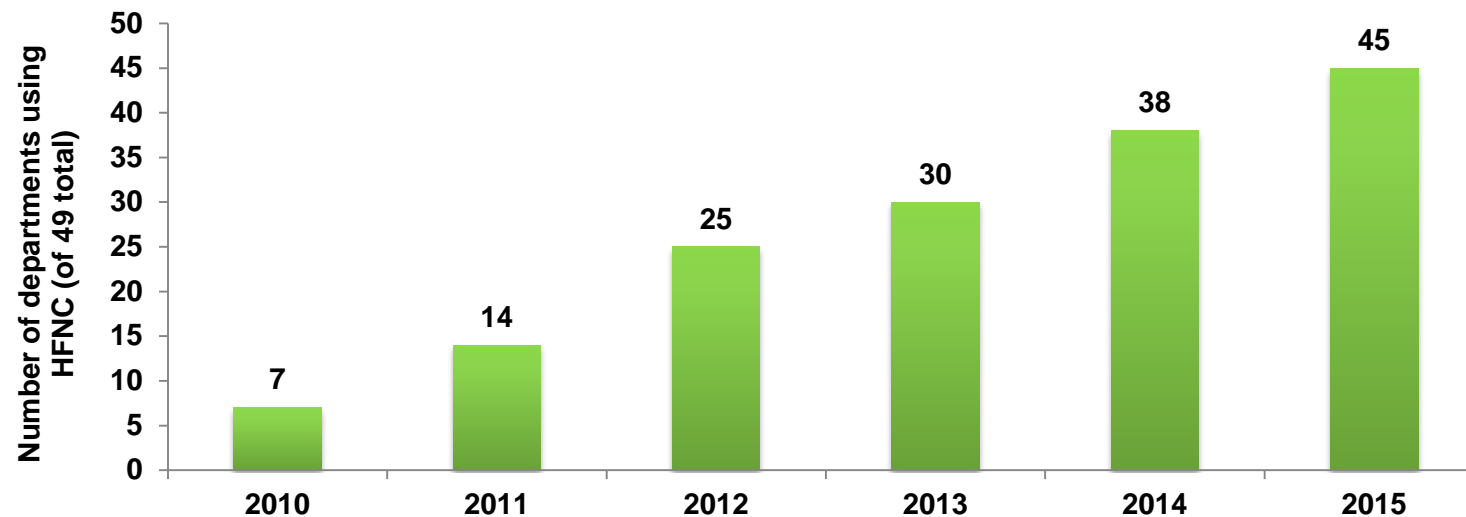
Year	Total BRONCH	HF and HF + N	Total intubated
2005	52	7 (13%)	19 (37%)
2006	72	32 (44%)	21 (29%)
2007	49	23 (46%)	15 (31%)
2008	90	56 (62%)	12 (13%)
2009	67	44 (66%)	5 (7%)
Total	330	161 (49%)	72 (22%)

2016: Current intubation rate <3%



Survey of NHF therapy use in Australia

- 83 general paediatric departments (peripheral/secondary/tertiary)
- 7/8 tertiary, 5/6 secondary and 38/69 peripheral response



Survey of NHF therapy use in Australia

Diagnostic groups

- 100% of departments use it for bronchiolitis
- 82% in pneumonia
- 55% in reactive airways (asthma)
- 40% in other respiratory disease



Other benefits of NHF therapy

- Can be applied very early in the disease process
- Greater patient tolerance
- Ease of application
- Clinical effectiveness



What are the trials we need to do?

- RCT in infants with bronchiolitis
- RCT in infants and children with Acute Hypoxic Respiratory Failure:
 - Pneumonia
 - Pneumonitis
 - Reactive Airway Disease (Asthma)

When, Where and How?

- Start in ED ? Early ?
- Start only if admitted ?
- Start only if certain severity threshold is achieved?





Paediatric Acute Respiratory Intervention Studies

High Flow Trial



PARIS 1 Background



Burden of Bronchiolitis

- Highest number of non-elective PICU admissions in 2015 (19%).
- Low mortality (~0%)
- Median PICU LOS 3.08 days
- Currently ANZPIC data registry showing higher figures for bronchiolitis admitted to ICU. Compatible with USA data which is also increasing. Is this due to NHF being used in some centres in ICU only?
- USA cost burden – US\$1.7B/annum (Hagaswasa)

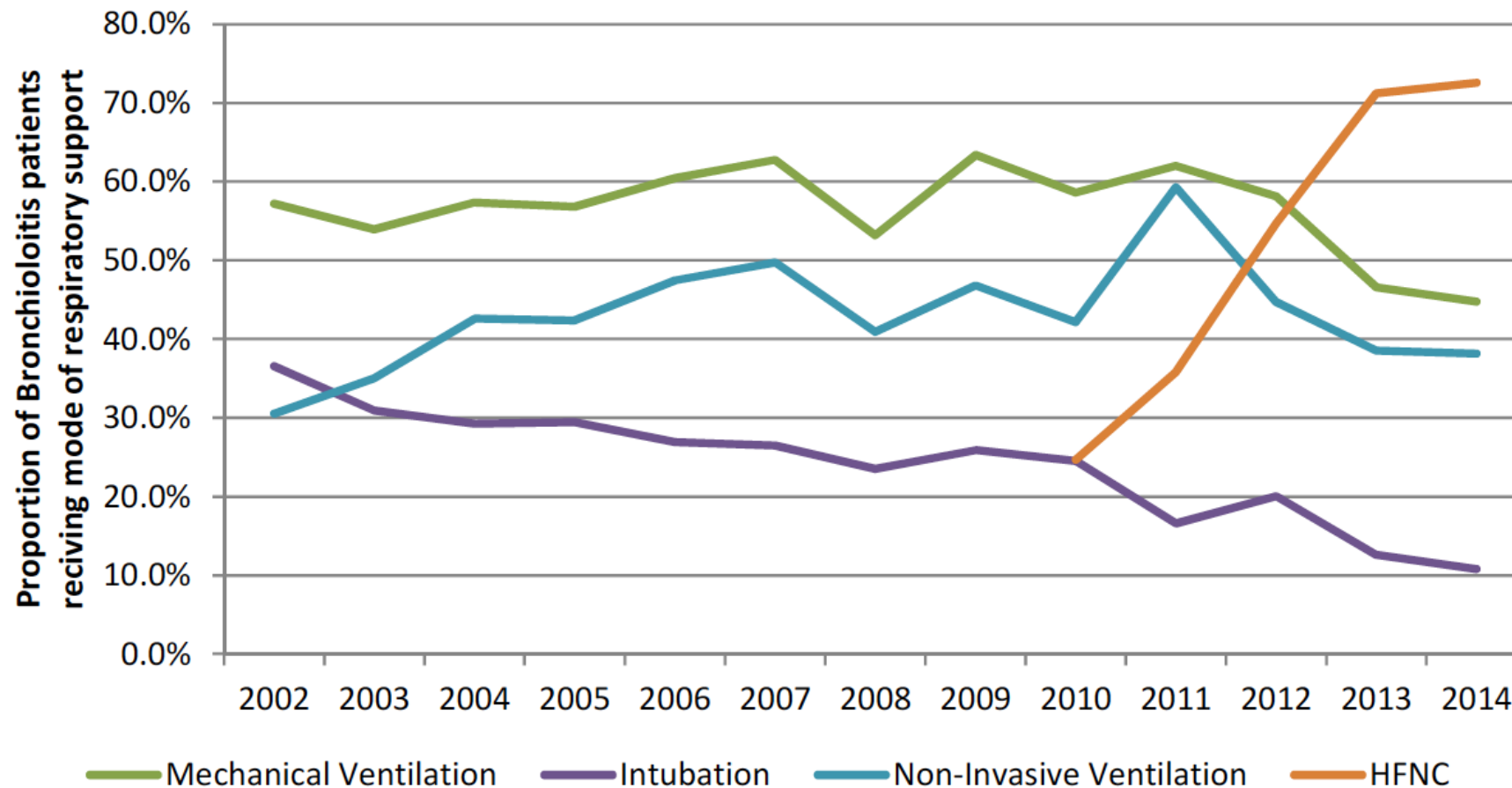
Should NHF therapy be used outside of ICU??



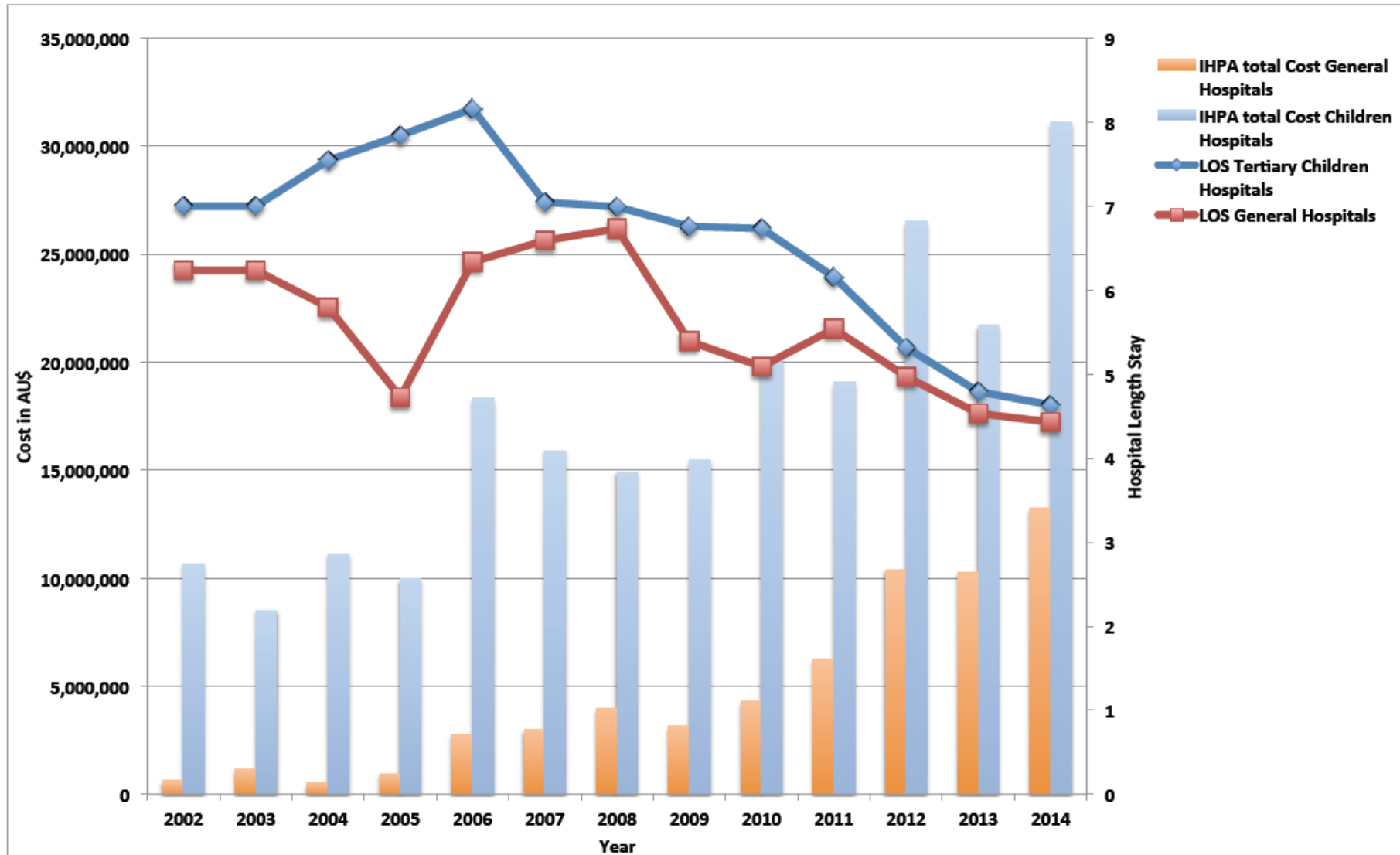
Year	Mechanical Ventilation	Intubation	Non-Invasive Ventilation	NHF therapy
2002	57.2%	36.6%	30.5%	
2003	53.9%	30.9%	35.0%	
2004	57.4%	29.2%	42.6%	
2005	56.8%	29.5%	42.4%	
2006	60.5%	26.9%	47.5%	
2007	62.8%	26.5%	49.7%	
2008	53.2%	23.5%	40.9%	
2009	63.4%	25.9%	46.8%	
2010	58.6%	24.5%	42.2%	24.7%
2011	62.0%	16.6%	59.3%	35.8%
2012	58.1%	20.1%	44.7%	54.7%
2013	46.6%	12.6%	38.5%	71.2%
2014	44.8%	10.8%	38.2%	72.6%



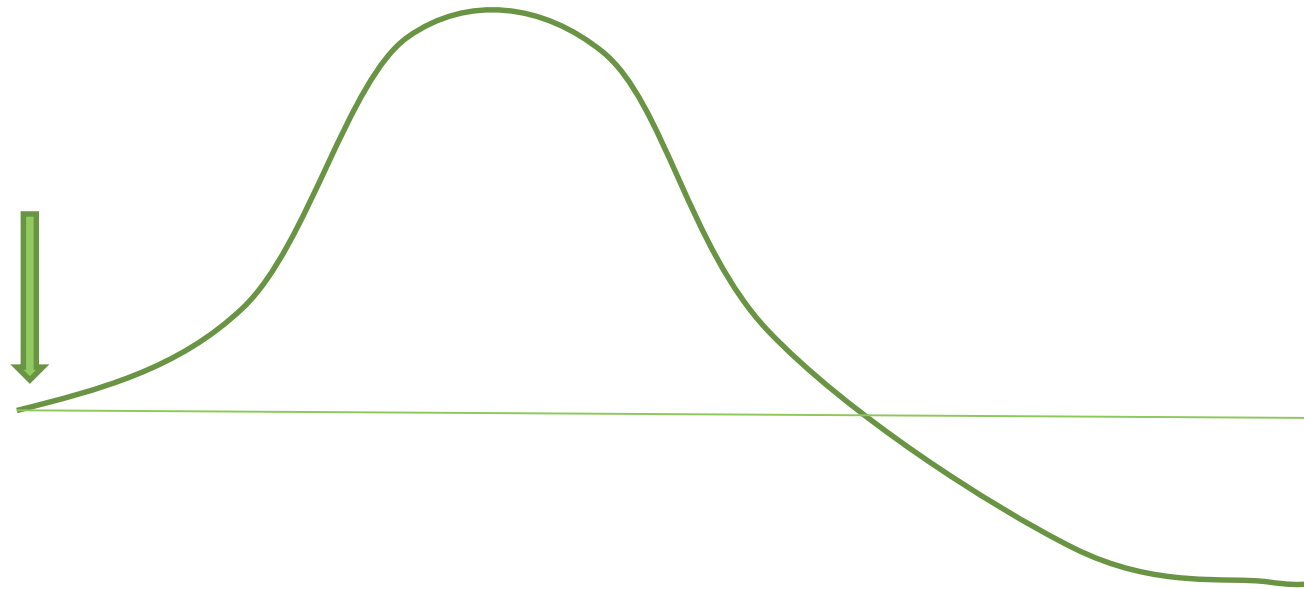
Modes of Respiratory Support in PICU for Bronchiolitis



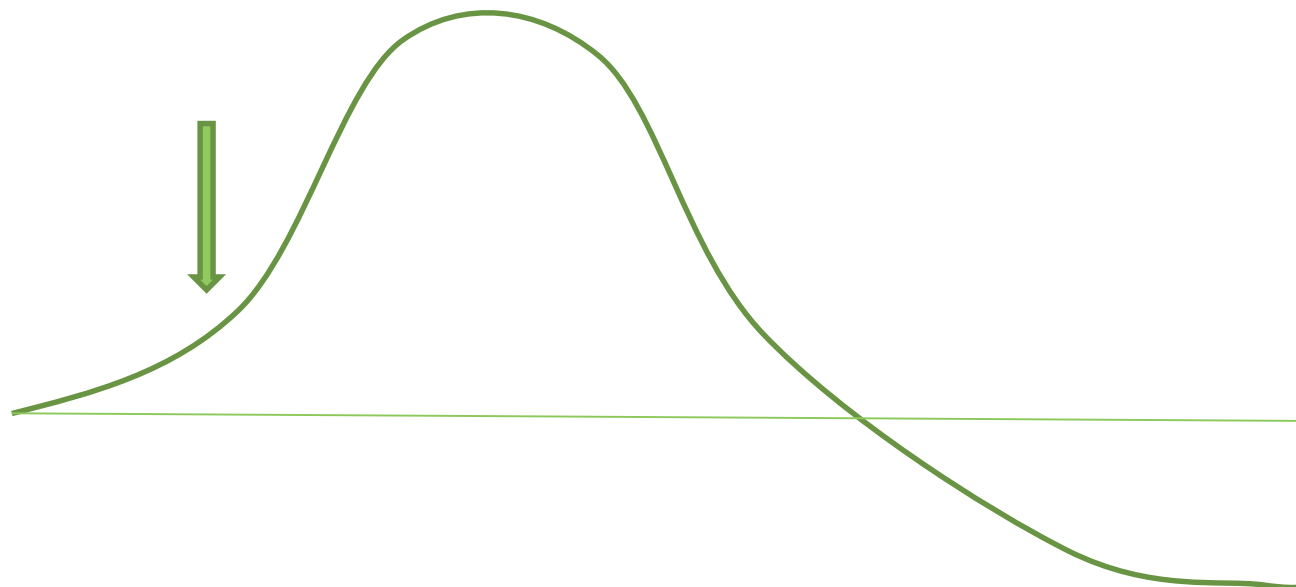
Health care costs associated with Bronchiolitis infants admitted to ICU



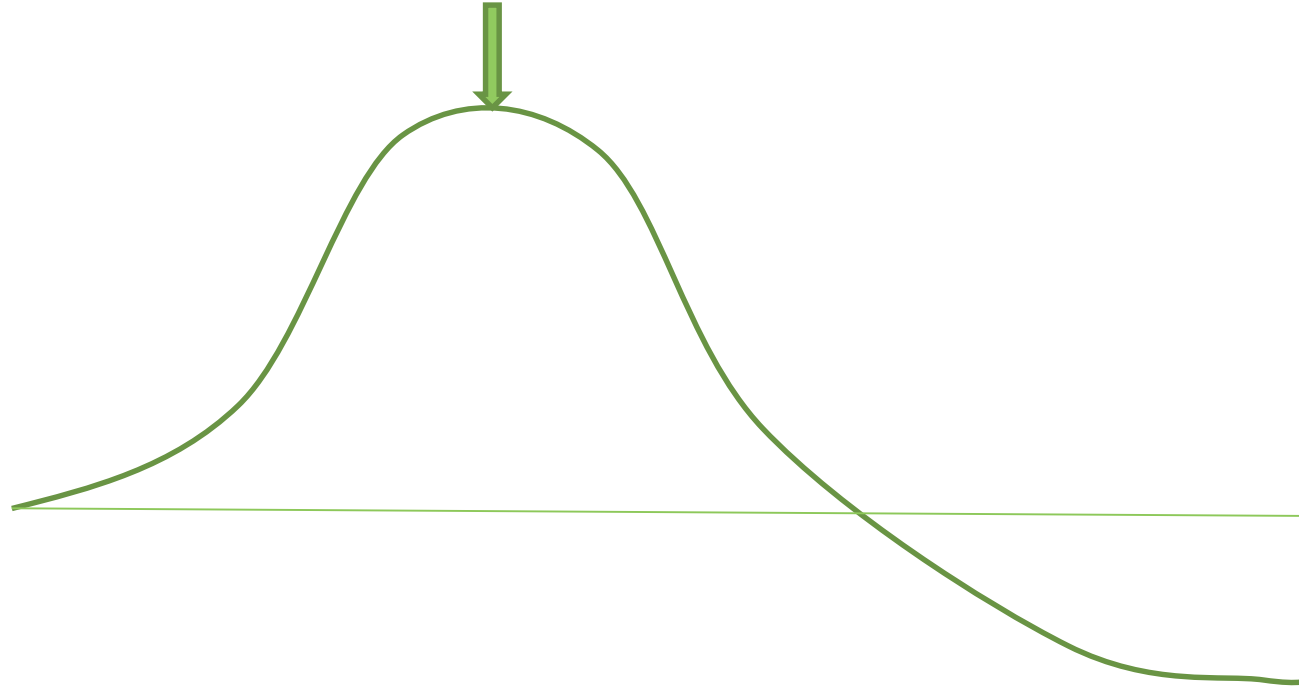
**NHF
introduction**



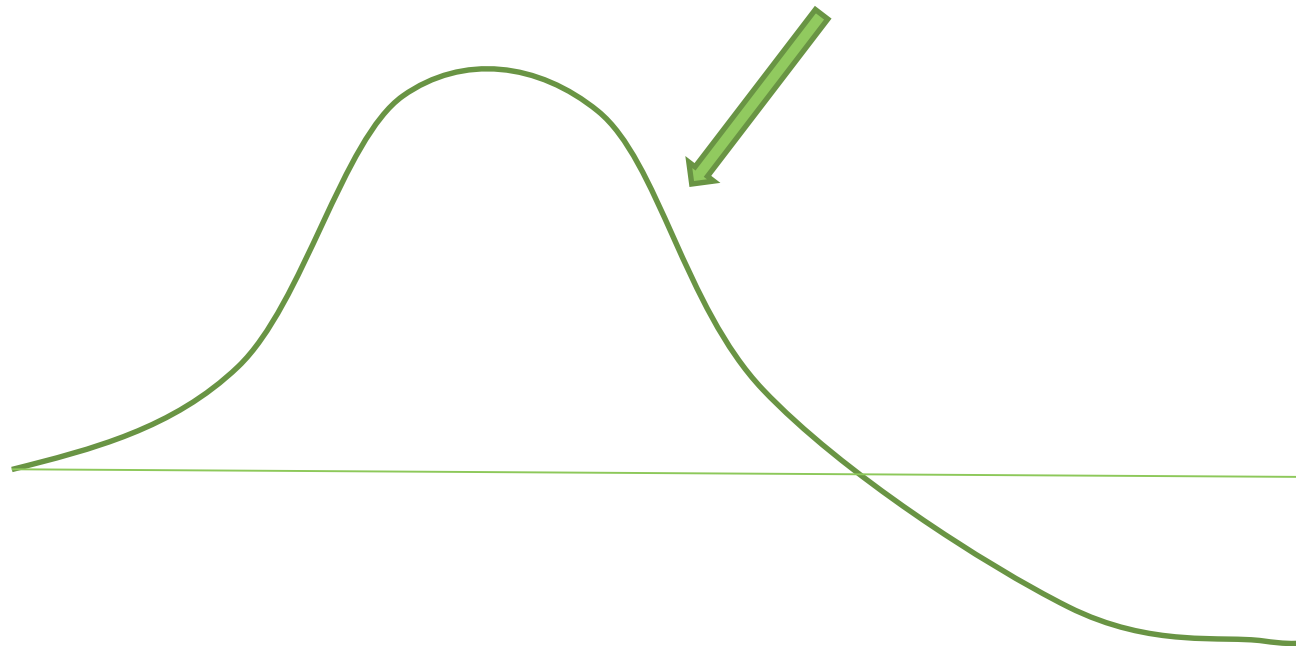
**NHF =
Everybody
Loves it**

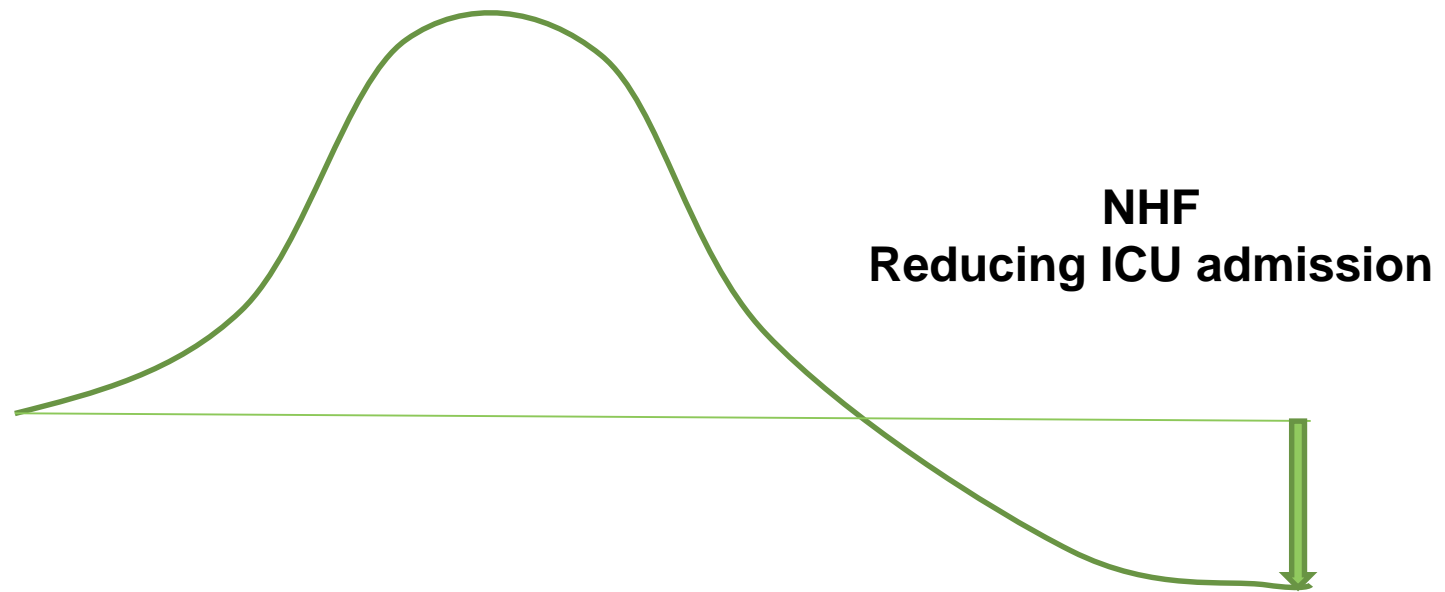


NHF
Everybody
is over it



NHF
Introduced in Paeds Ward





PARIS I – Nasal High Flow therapy in infants with bronchiolitis – a Randomised Controlled Trial

AIM

To compare in a Randomised Controlled Trial, Nasal High Flow therapy to standard oxygen delivery in infants with bronchiolitis, presenting to regional, metropolitan and tertiary centres.

PRIMARY OUTCOME

Defined as treatment failure of NHF therapy or standard oxygen therapy.

INCLUSION CRITERIA

- Infants < 12 months of age
- Diagnosis of bronchiolitis
- Oxygen requirement (SpO₂ <92% in room air)

SAMPLE SIZE: 1400



Secondary Outcomes

To measure:

- reduction in the need for retrievals/ICU admission
- reduction in intubation rate
- reduction in LOS
- length of oxygen therapy
- adverse effects
- health care costs
- study effect of room air only?

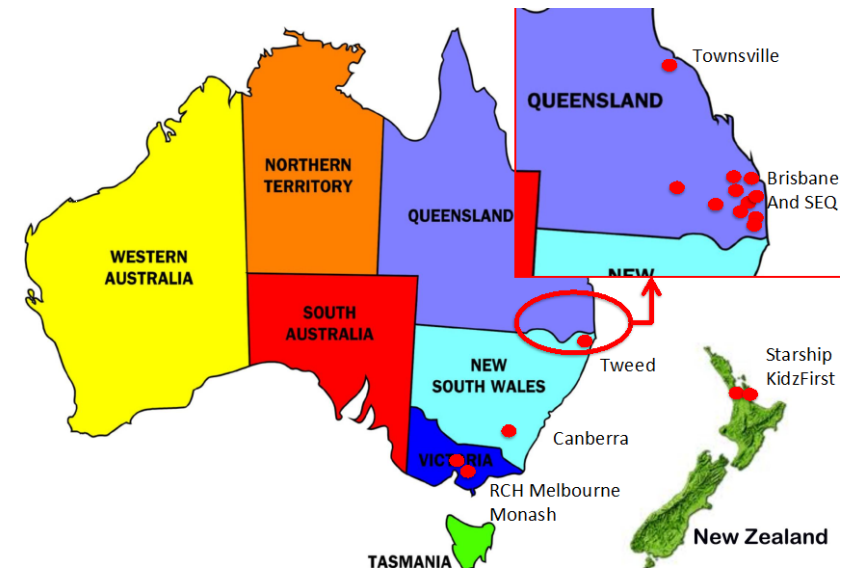


Recruitment over 3 years – 1400 patients

- **Nine Regional Hospitals**
- Ipswich Hospital
- TPOCH
- Redcliffe Hospital
- Redland Hospital
- Caboolture Hospital
- Logan Hospital
- Nambour Hospital
- Toowoomba Hospital
- The Tweed Hospital

Additional PREDICT sites with NHMRC funding

- LCCH
- GCUH
- RCH – Melbourne
- Monash – Melbourne
- Canberra Hospital
- Townsville Hospital
- Starship – Auckland NZ
- KidzFirst, Middlemore – NZ

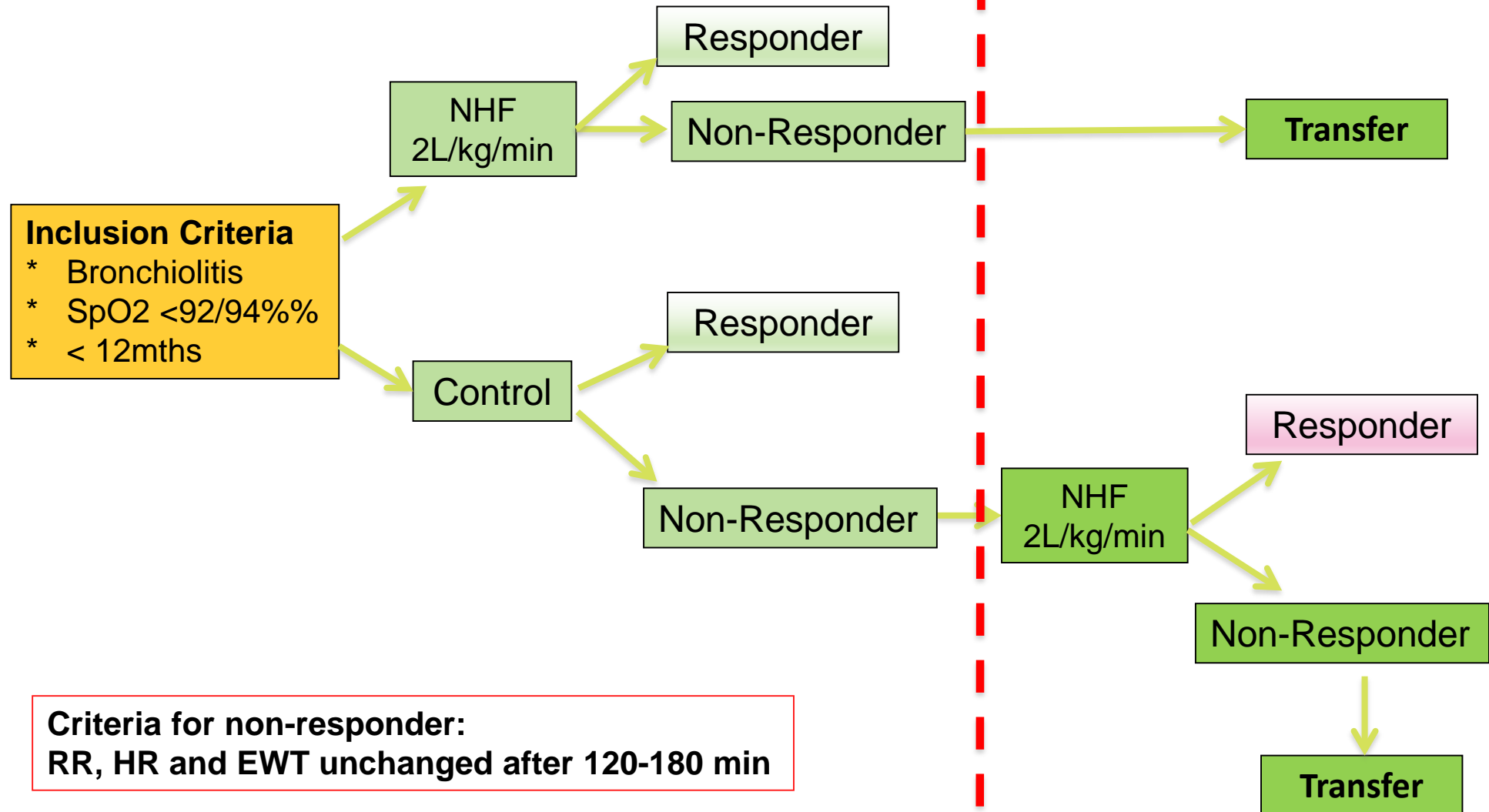


Study Protocol

n=1400

\$1.3 M NHMRC funding

Primary Outcome



Baseline Characteristics

	Standard Oxygen	Nasal High Flow
Sex	N=731	N=745
Male	469 (64%)	455 (61%)
female	261 (36%)	287 (39%)
Median age	months (IQR) 6.1 (3.4)	months (IQR) 5.8 (3.5)
Age		
≤3 month	185 (25%)	207 (28%)
3-12 months	546 (75%)	538 (72%)
Prematurity	107 (15%)	127 (17%)
Weight (kg) (SD)	7.6 (2.2)	7.3 (2.3)
Virus detected		
RSV positive	321 (44%)	335 (45%)



Primary Outcomes	Standard Oxygen	Nasal High Flow	P value	Odds ratio
Failure Rate	N=731 167	N=745 89	#0.0001	2.20 (1.65-2.89)
% of patients	23%	12%		
Non-responders/Responders <3month of age	55/130	28/179	#0.0001	2.71 (1.63-4.50)
Non-responders/Responders 3-12 months of age	112/434	61/477	#0.0001	2.02 (1.44-2.83)
Length of O2 therapy (median)	days (IQR)	days (IQR)		
All infants	1.23 (1.82)	1.24 (1.81)	*0.218	
All infants without ICU admission	1.13 (1.54)	1.07 (1.51)	*0.025	



PARIS II



Paediatric Acute Respiratory Intervention Studies

Acute Hypoxemic Respiratory Failure AHRF Trial

AHRF BACKGROUND

- 6.3 million children < 5yrs died worldwide in 2013 (WHO)
 - ✧ 1 million of these deaths - caused by resp infections
- AHRF - most frequent reason for paed's admission
 - ✧ Most common initial treatment is to offer O₂
- Approx 20% of children with AHRF rapidly deteriorate and require assisted breathing with positive pressure or mechanical ventilation (PICU)
- Very little evidence in children with AHRF



PARIS II

Nasal High Flow therapy in children with Acute Respiratory Failure – a Randomised Controlled Trial

AIM

To compare in a Randomised Controlled Trial, Nasal High Flow therapy to standard oxygen delivery in infants and children with Acute Hypoxemic Respiratory Failure (AHRF), presenting to regional, metropolitan and tertiary centres.

PRIMARY OUTCOME

Defined as treatment failure of NHF therapy or standard oxygen therapy.

INCLUSION CRITERIA

- Infants and children 0-16 yrs of age
- Diagnosis of AHRF and admitted to hospital
- Oxygen requirement (SpO₂ <92% in room air)

SAMPLE SIZE: 610



Secondary Outcomes

- To determine if use of NHF therapy reduces the need for hospital transfer to a tertiary centre
- To determine if there is an age dependent efficacy of NHF therapy
- To perform Subgroup Analysis for children with:
eg. RAD (asthma), Bronchiolitis 12-24mths, Acute Lower Resp. Tract Infection



CHALLENGES PARIS 1 & 2 – Study specific

- Bias (creep in effect)
- If NHF therapy has been used prior in a centre (stronger bias present)
- Adherence to protocol by medical staff – change in diagnosis to place child on NHF (bias) Consent Research culture present or not
- Study Fatigue (PARIS 2 with dual trials)



THANK YOU



myAirvo Research Update

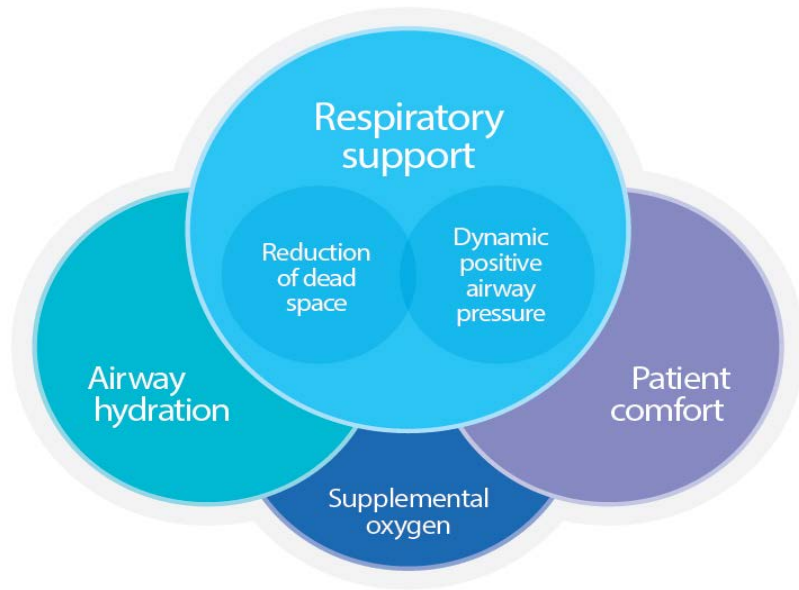
Chris Crone
Research & Development Manager –
Airvo/Optiflow



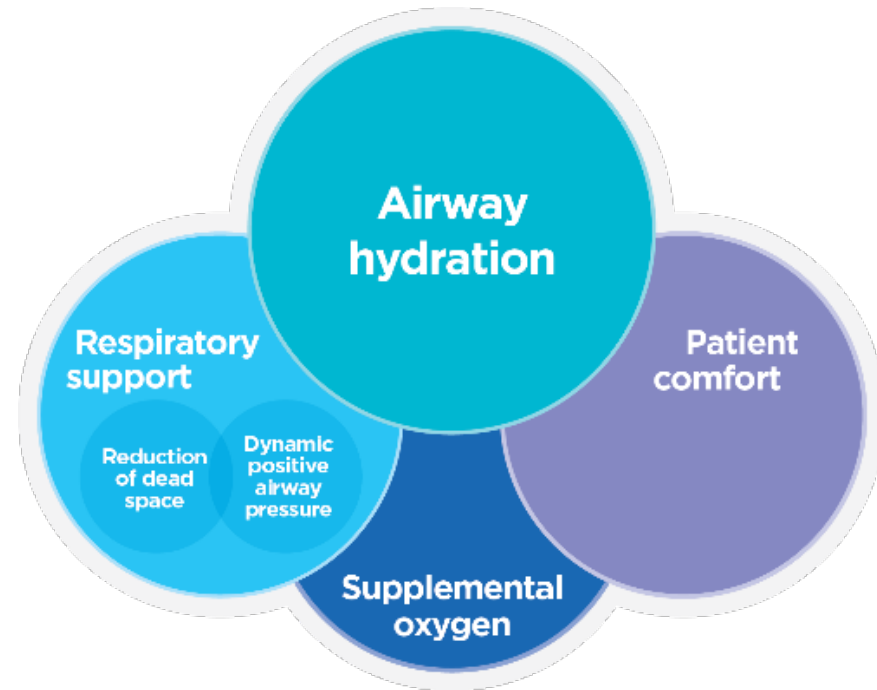
Nasal High Flow - Acute vs. Chronic use

- Same therapy, different uses, different benefits

Acute



Chronic



Home-based clinical research

- More research being carried out in the home
- Challenges
 - Patient group – age, care needs
 - Logistics
 - Compliance monitoring
 - Longer treatment times (1 year : 5 years)
 - Higher costs



Mechanisms research

Author <i>Journal</i> Yr	n	Population	Comparison	F/up	Effects
Hasani <i>Chron Resp Dis</i> 2008	10	Bronchiectasis	NHF vs no NHF	7d	↑ Increased Mucociliary clearance
Fraser <i>Thorax</i> 2016	10	COPD	NHF vs O ₂	<1d	↓ Reduced CO ₂ (measured through skin) ↓ Reduced Respiratory Rate ↑ Increased Tidal Volume
Bräunlich <i>J COPD</i> 2016	48	COPD	NHF vs O ₂	<1d	↓ Reduced CO ₂ (measured through skin) ↓ Reduced Respiratory Rate ↑ Increased Tidal Volume
Biselli <i>J Appl Physiol</i> 2016	18	COPD	NHF vs O ₂	<1d	↓ Reduced CO ₂ (measured through skin) ↓ Reduced Work of Breathing ↓ Reduced Minute ventilation
Pisani <i>Thorax</i> 2017	14	Hypercapnic COPD	O ₂ vs NHFO ₂ and NIV	<1d	↓ Reduced Respiratory Rate ↑ Increased Tidal Volume ↓ Reduced CO ₂ (blood gas)
Pilcher <i>Respirology</i> 2017	24	AECOPD	NHF vs O ₂	<1d	↓ Reduced CO ₂ (blood gas)
McKinstry <i>Respirology</i> 2017	48	COPD	NHF vs breathing	<1d	↓ Reduced CO ₂ (measured through skin) ↓ Reduced Respiratory Rate

Outcomes research

Author <i>Journal</i> Yr	n	Population	Comparison	F/up	Message
Rea <i>Resp Med</i> 2010	108	COPD & Bronchiectasis	NHF (w and w/o O ₂) vs SC	1y	Improved exacerbation days, time to 1 st exacerbation, reduced antibiotic use
Cirio <i>Resp Med</i> 2016	12	COPD in Pulmonary Rehab	NHFO ₂ vs Venturi O ₂	<1d	Improved exercise tolerance
Macann <i>Int J Radiation Oncol Biol Phys</i> 2010	210	Head & Neck Cancer patients with mucositis	NHF vs Usual care	12w	Improved patient functioning, nutritional events, decreased number of inpatient days
McNamara <i>Resp Care</i> 2014	15	Tracheostomy	THF vs HME	10w	Long term: reduced adverse events

COPD research underway

PI, Country	n	Population	Comparison	F/up	Primary Outcome
Weinreich, Denmark	200	COPD	NHFO ₂ vs O ₂	1y	Exacerbations & hospital admissions
Mansfield, Australia	150	COPD	NHF vs no NHF	30d	Length of Stay, 30 d readmission
Bräunlich, Germany	100	COPD	NHF vs Bilevel	6w	Capillary CO ₂
Nilius, Germany	40	COPD	NHFO ₂ vs O ₂	1y	Overnight trans. CO ₂
Chihara, Japan	32	COPD w CRF	NHFO ₂ vs O ₂	4w	6 Min. Walk Distance
Tomii, Japan	30	COPD	NHFO ₂ vs O ₂	6w	Quality of Life (St Georges Resp. Quest.)
Allen, USA	30	COPD	NHF(O ₂) vs Usual	3m	Quality of Life (Breathless, Cough Sputum Scale)
Fernandes, USA	30	COPD	NHFO ₂ vs O ₂	1y	Hospitalizations
Bräunlich, Germany	20	COPD	NHF Neb vs Neb	< 1d	Lung Function (FEV ₁)
Criner, USA	10	Unstable COPD	NHF	5 d	Ability to maintain SpO ₂ > 90%
Criner, USA	30	COPD	NHF	90 d	Compliance

A bright outlook

- There are challenges to home-based research
- Studies are underway with myAirvo and early results are promising

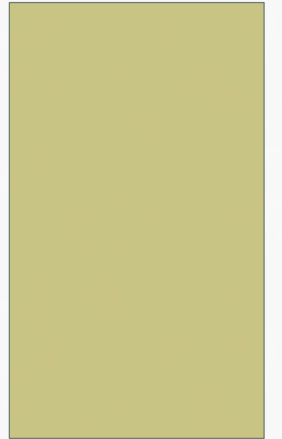


Questions?



HOSPITALIZED COPD EXACERBATIONS:

NASAL HIGH FLOW HUMIDIFIED AIR VIA HOSPITAL IN THE HOME
A/PROF DARREN MANSFIELD
MONASH HEALTH



DISCLOSURE

- A/Prof Mansfield has received research funding from Fisher & Paykel Healthcare.
- Fisher & Paykel Healthcare will make a donation to the Monash Lung and Sleep Institute and Assoc Prof Mansfield will be reimbursed for any expenses incurred in connection with his participation in today's event.

THE BURDEN OF DISEASE ON THE ACUTE FACILITY

- COPD exacerbations Dandenong Hospital
- 90% are admitted to hospital
 - No/yr
 - LOS 5.9 days
 - 60 day readmission rate 22%

Large numbers due to comorbidities and social circumstances rather than severe acute exacerbations

CHARACTERISTICS



FLOW RATES -60L/MIN

TEMPERATURES 37 DEGREES

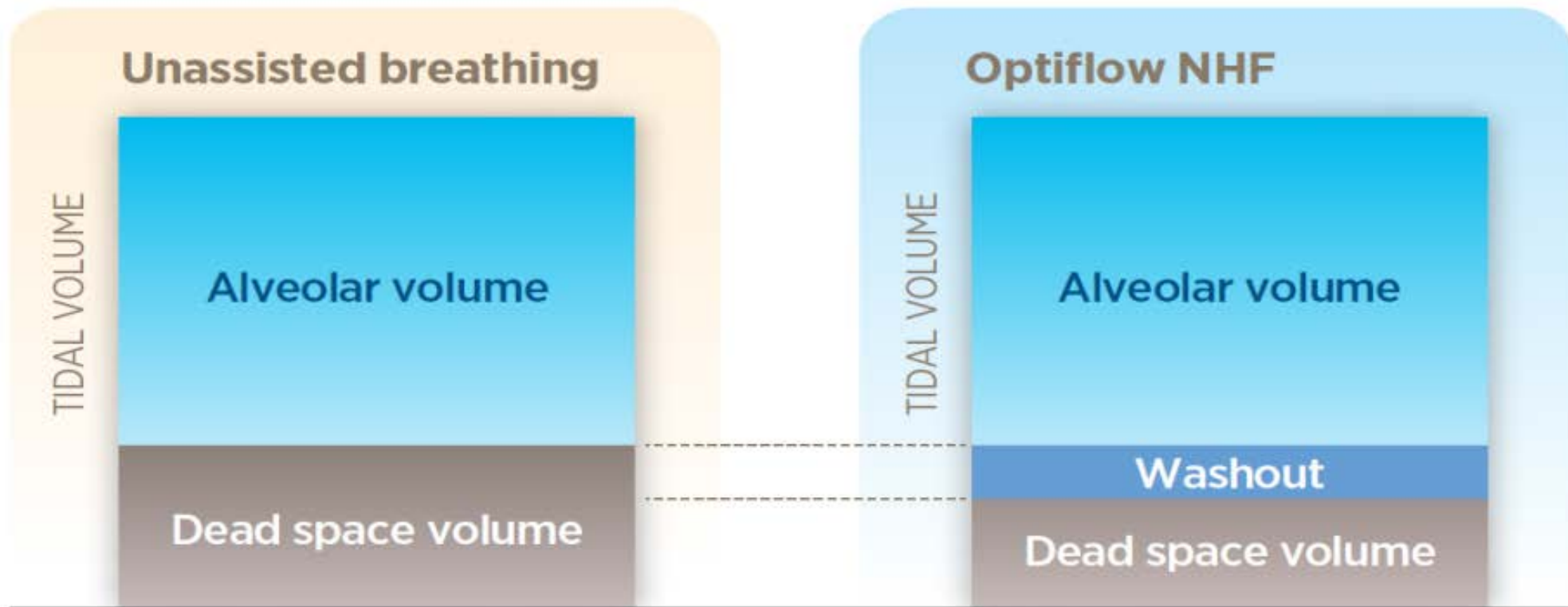
LOOSE FITTING CANNULA

POSTULATED BENEFITS

- Facilitative effects
 - Staff
 - Patients
- Clinical/Physiological Effects

Reduction of dead space

Reduces rebreathing of gas with high CO_2 and depleted O_2



1. Mündel T. et al. *J Appl Physiol*. 2013.
2. Möller W. et al. *Am J Respir Care Med*. 2012.



PRELIMINARY NUMBERS

- Admissions under Hospital In The Home (HITH) = 20
- Readmissions post discharge from HITH = 1
- Patients who purchased AIRVO system privately = 2
- Good outcomes in patient satisfaction with care & symptom improvement while on NHF

SUMMARY

- Can realistically be incorporated into an acute clinical management setting
- Reduces hospital length of stay, inpatient complications and recurrent admissions
- Beneficial not only to patients
- Can assist in unloading the healthcare system

Thank you

Driving Patient Success with OSA Therapy

Fiona Cresswell
General Manager Marketing



Unique and Personal



The Threat

- Up to 100M OSA sufferers^{1,2}
- CPAP therapy is the gold standard of treatment
- Up to 50% will abandon therapy, many within first 2 weeks
- Untreated sleep apnea has many life threatening consequences



Main Drivers of Non-Adherence



- Leaks¹
- Facial Abrasions¹
- Mask Discomfort^{1,2}
- Claustrophobia^{1,2}

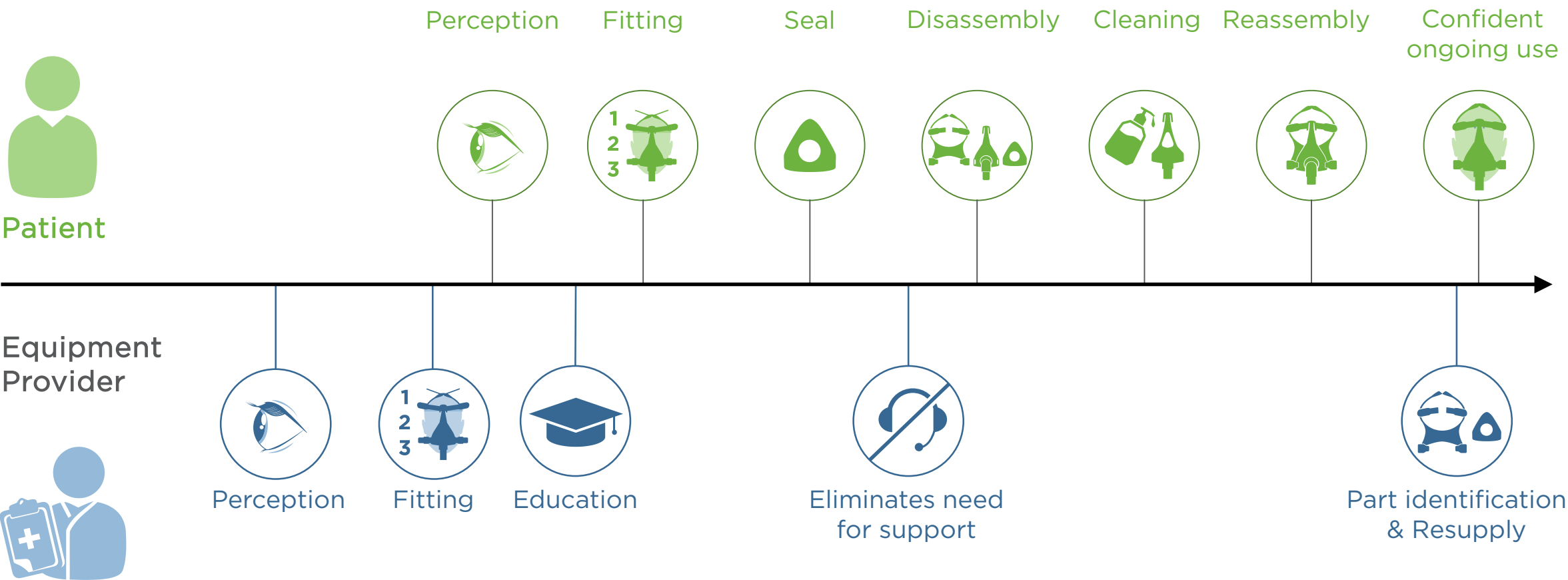
Intimacy of the Mask

- Comfort
- Seal
- Ease of Use

= CONFIDENCE



User Experience Mask Design Philosophy



Complex and Diverse Facial Anatomy



Our Leading-Edge Masks



F&P Simplus™



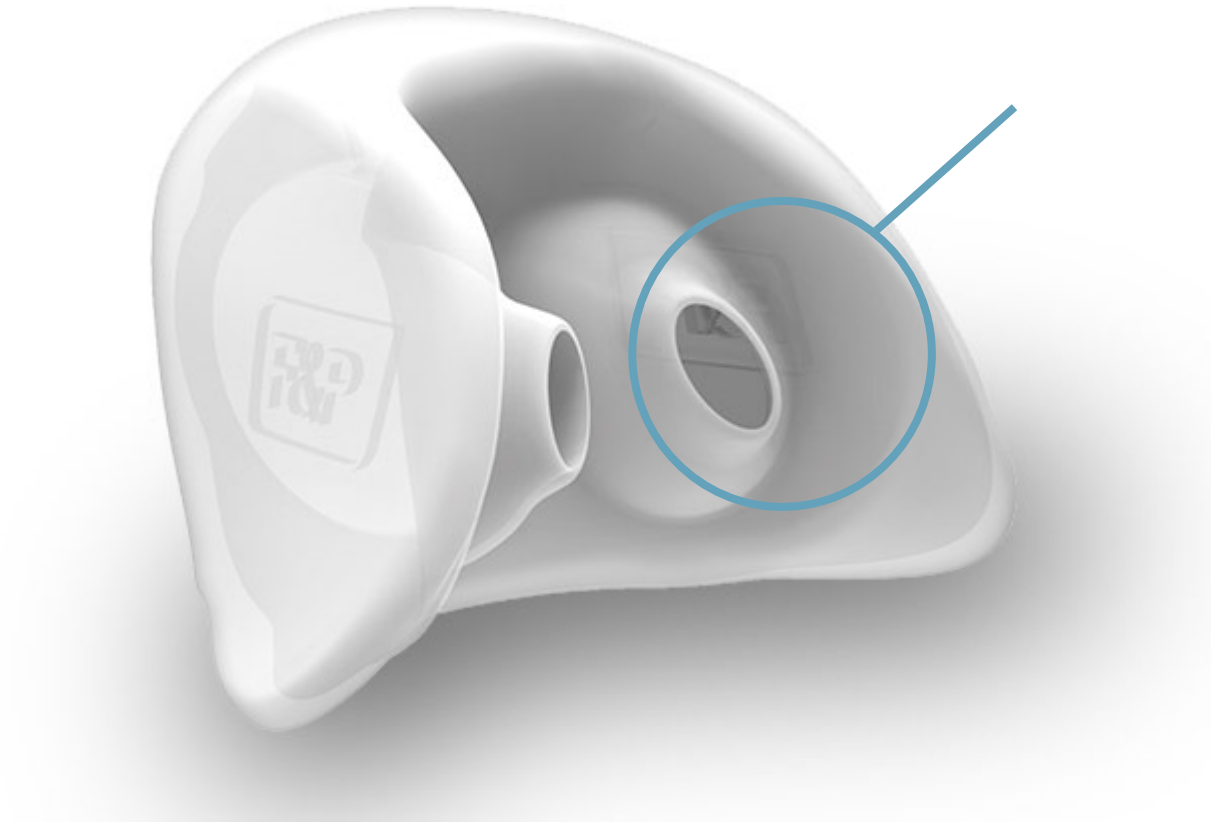
F&P Eson™ 2



reddot award 2017
winner

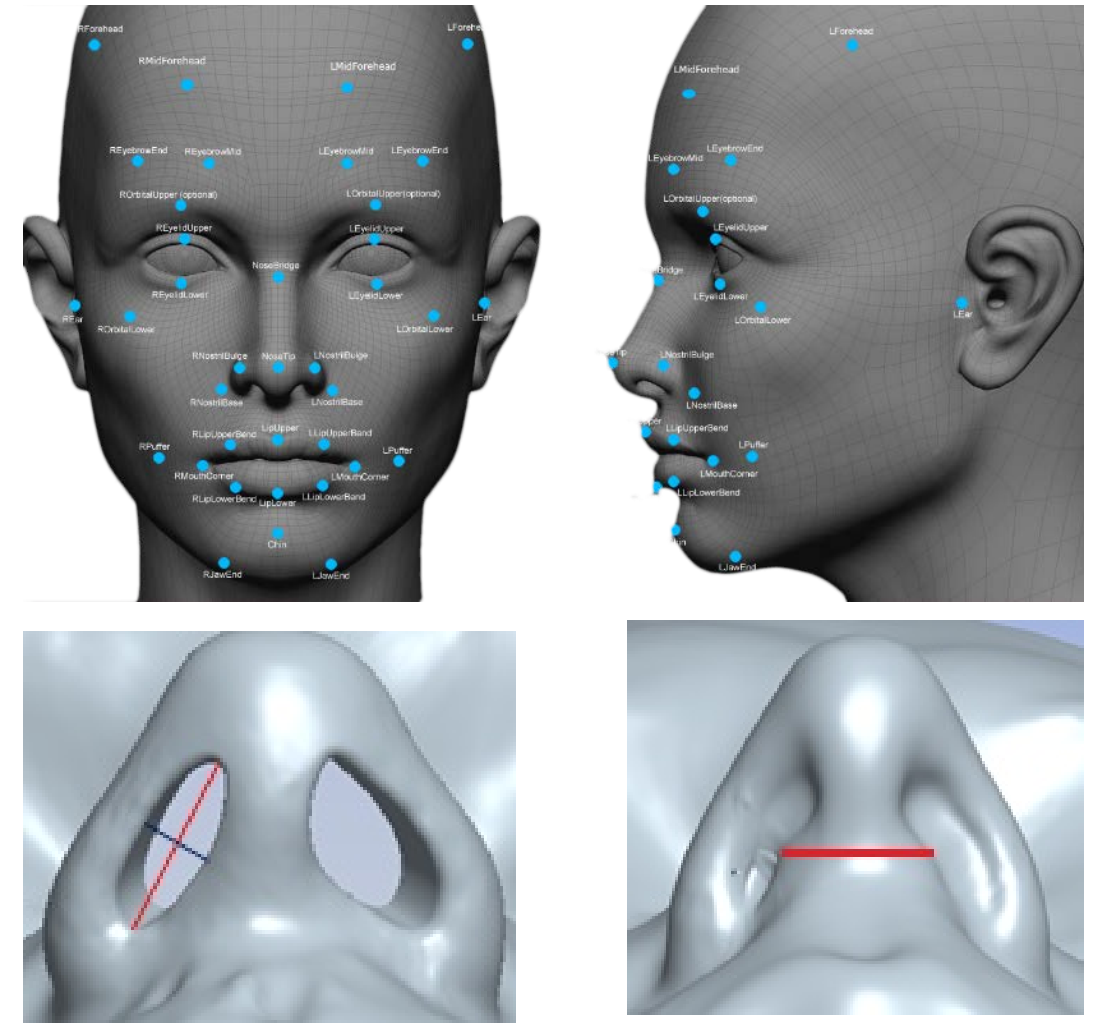
F&P Brevida™

AirPillow Seal



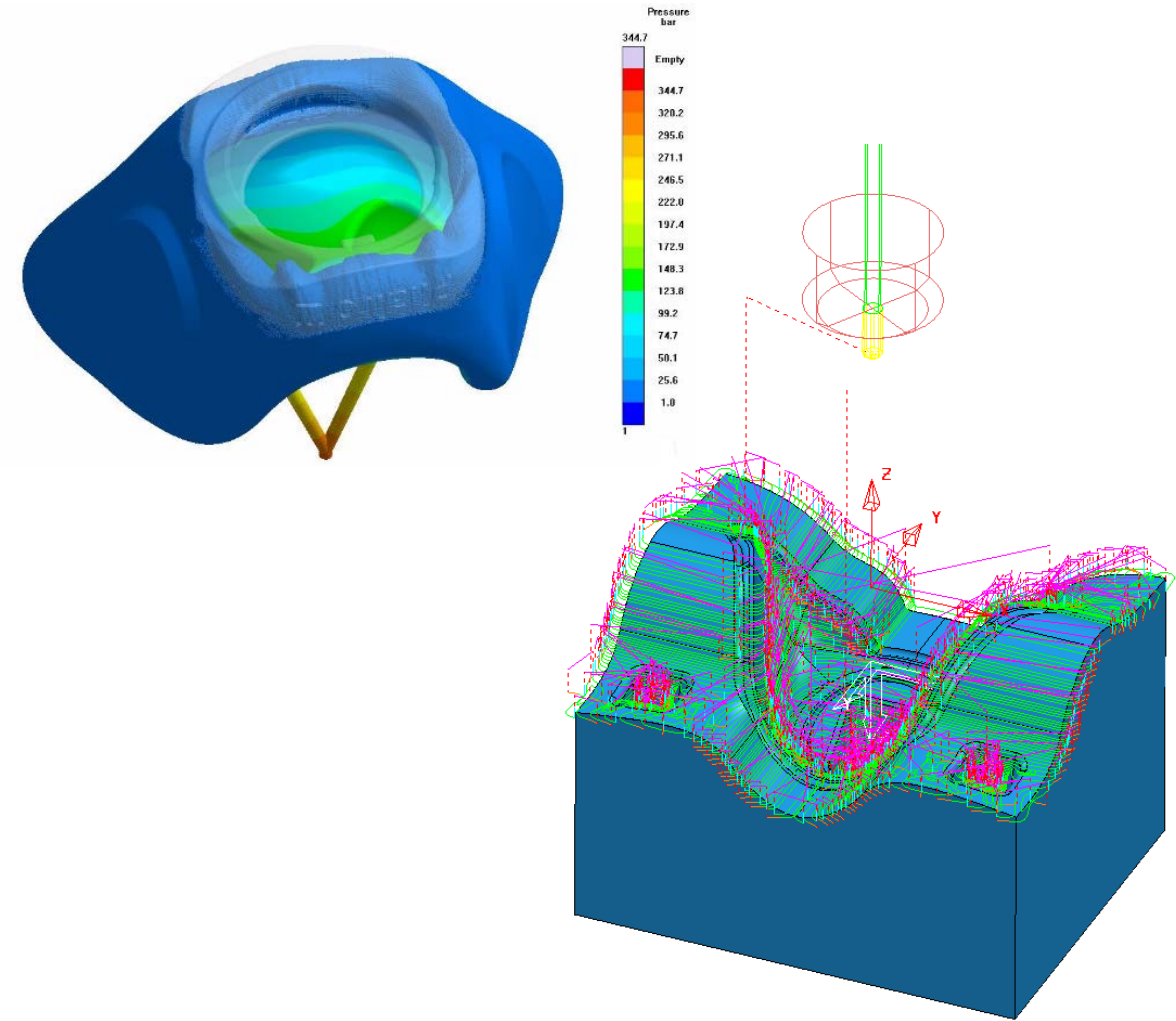
We Measure What Nature Created

- Facial Scanning
 - Many hundreds of real OSA participants
 - 200,000+ points captured
- Anthropometric Database
 - 42 key facial dimensions
 - Statistically analysed
 - Numerically driven seal design



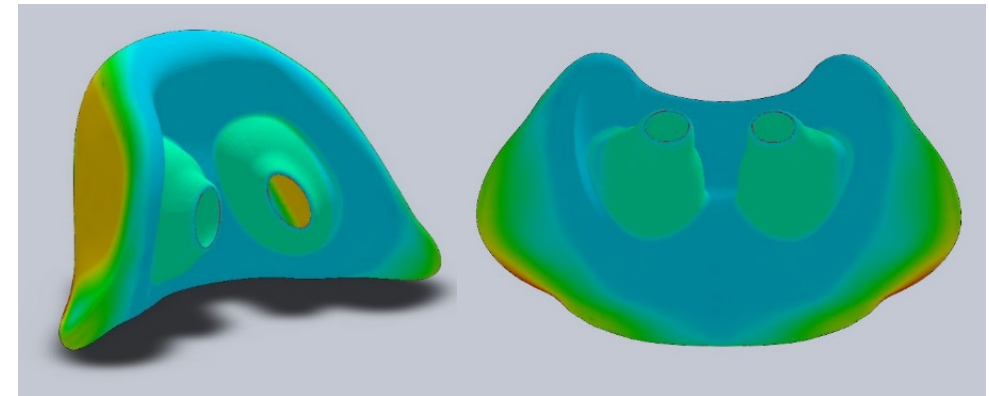
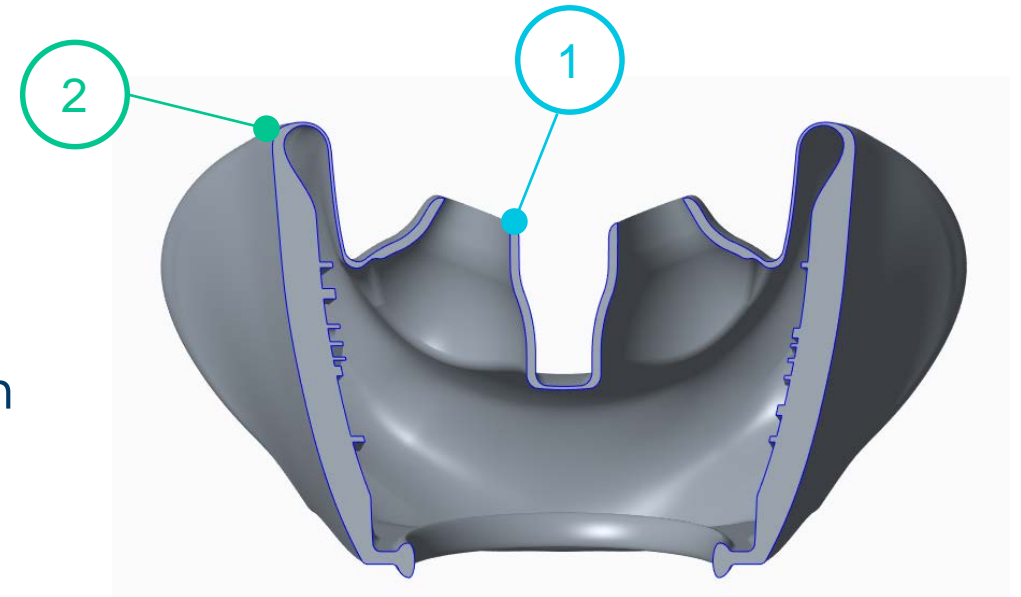
We Use Technology to Optimise Design

- 3D CAD Modelling
 - Gradient transitions
 - Integrated mask stabilizers
- Massive Variable Thickness Molding
 - 1200% range in single molded part
 - Satin surface finish



The Benefit

- Soft Nasal Prongs
 - 1/33 inch (0.75mm) thickness (1)
 - Gently contours to nostril shape
 - Significantly less pressure on the septum
- Super Thin Silicone Seal Membrane
 - Prongs surrounded by thin silicone
 - 1/100 inch (0.25mm) thickness (2)
 - Allows prong rotation in any direction



Adjustable Headgear

Adjustable to offer personalised secure fit



Tactile Feedback and locks in place



Provides stability against dislodgement

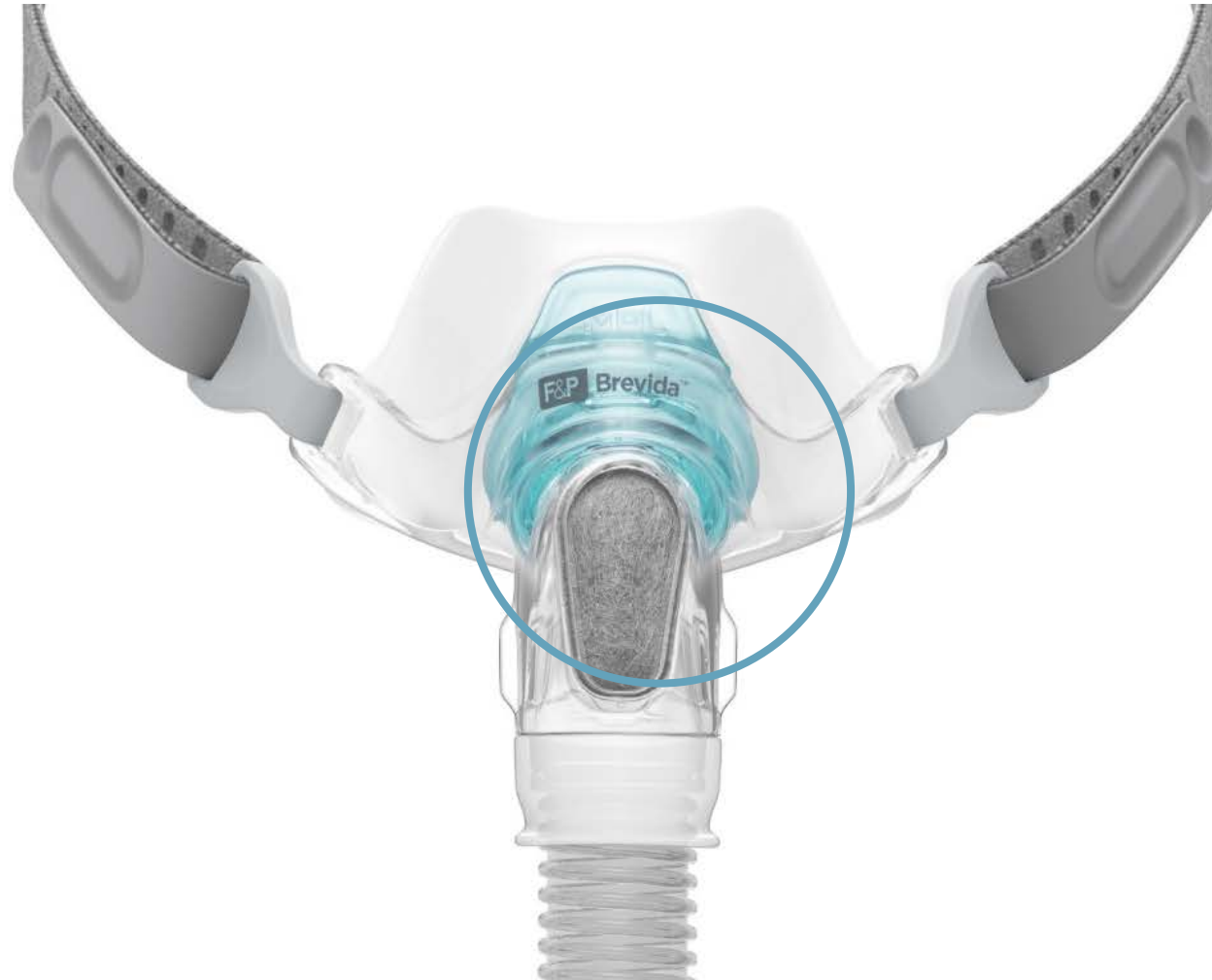


We Consider Real World Use

- Lifecycle Testing
 - Soaked in sweat solution
 - Cleaned over 50 times
 - Stretched 2800 times
- Destruction Testing
 - Pulled until broken
 - Target = 30N Force

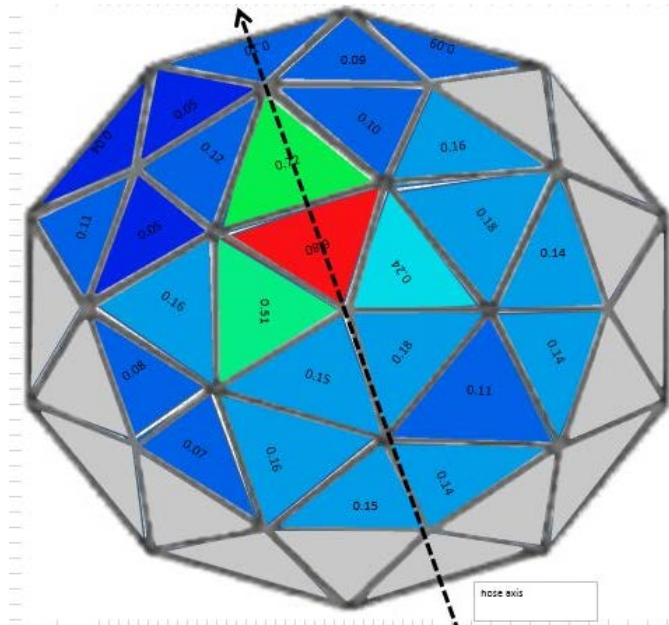


Washable Exhaust Diffuser



We Quantify the Invisible

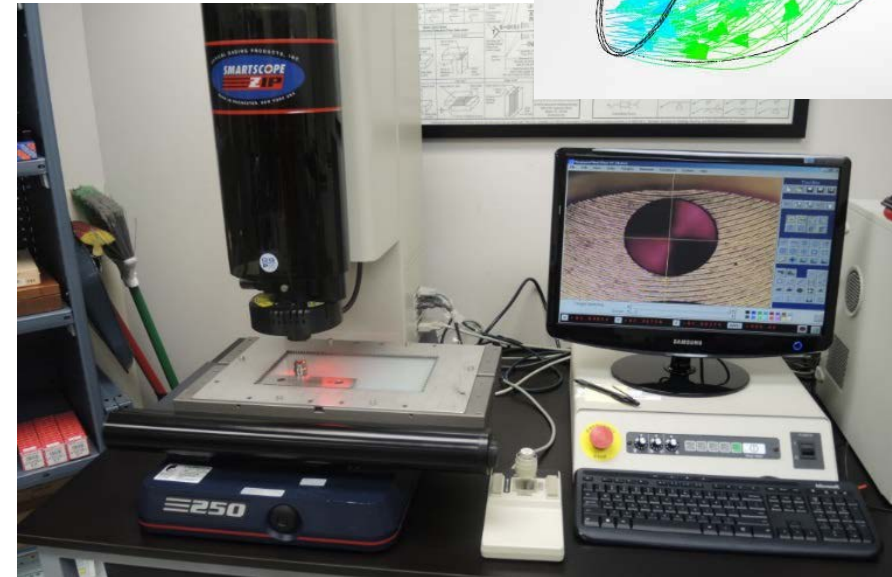
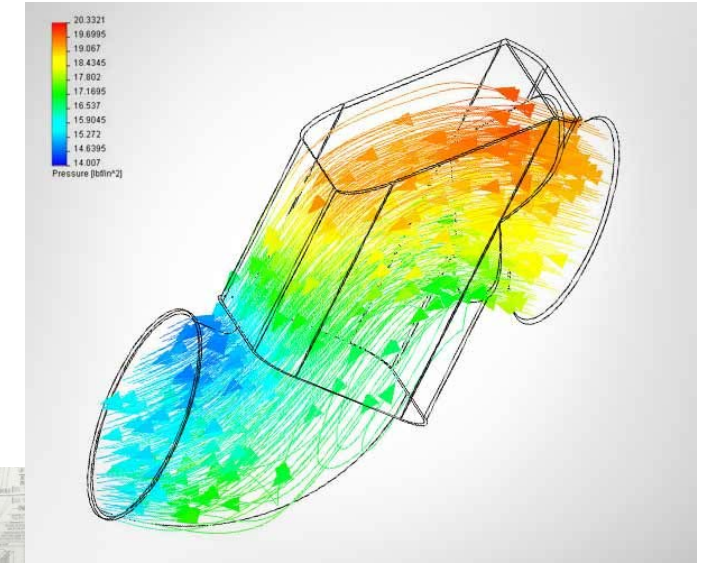
- Sound Testing
 - Target less than 25dBA
- Draft Testing



Anechoic Chamber

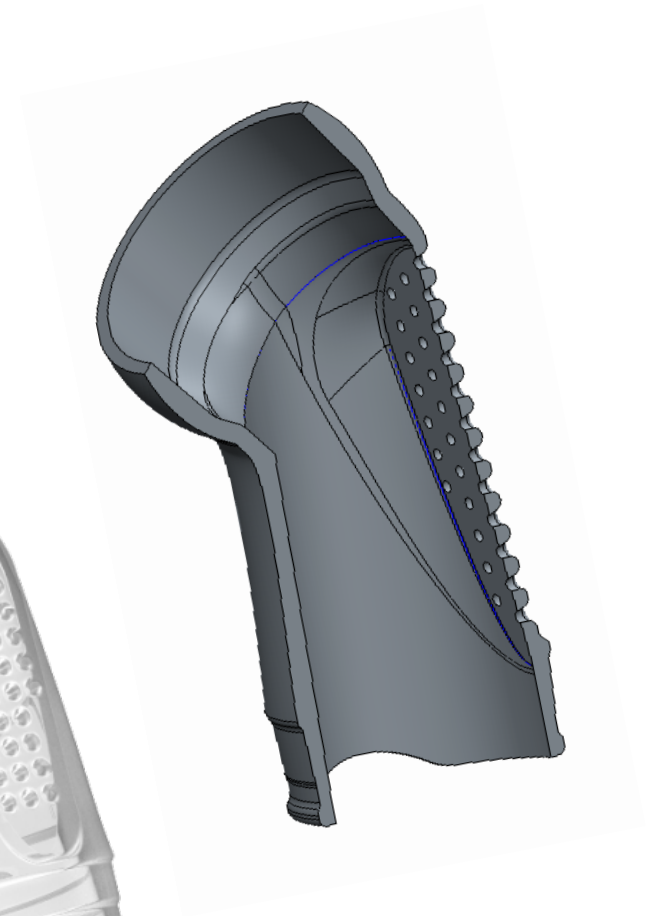
We Amplify Accuracy Using Technology

- Computational Fluid Dynamics
 - Map airflow
 - Highlight turbulence
 - Optimise design
- Optical Gauge Smartscope
 - Accuracy of 1.4 μ m



The Benefit

- Reduced air flow disruption
- Sound reduction - 17.5dB
 - similar to a ticking watch



Visiblue

- Blue Highlights incorporated into key components
- Supports mask education, orientation and reassembly



F&P SleepStyle

CPAP/Auto Therapy



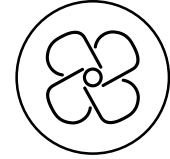
Freedom in Simplicity



Easy-access
Chamber



Built-in
connectivity
options

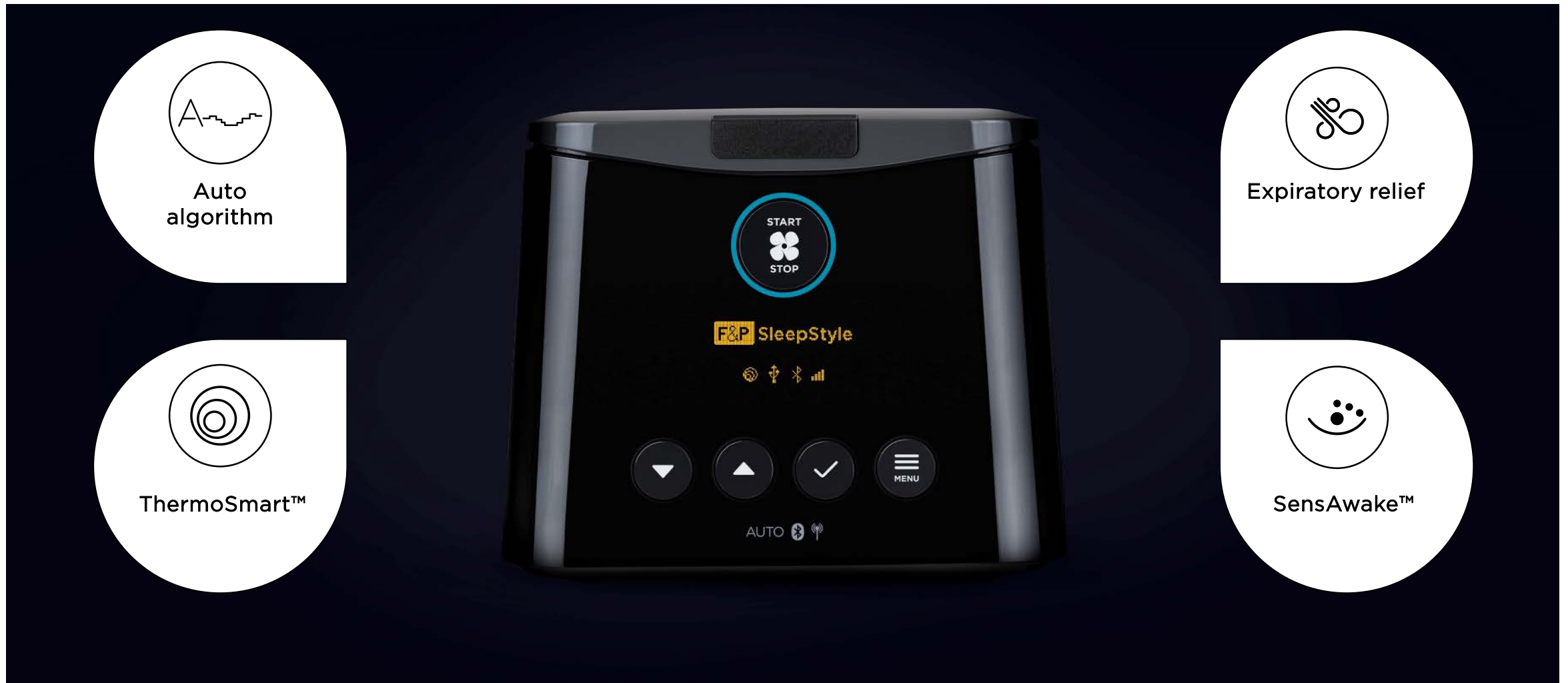


User-friendly
menu & buttons



Quiet, integrated
design

Powered by Technology



Engaging Patients



Apple, the Apple logo and iPhone are trademarks of Apple Inc., registered in the U.S. and other countries. Google Play and the Google Play logo are trademarks of Google Inc.

Empowering Clinicians



The Mask Matters Most



Questions?



Thank you

Fisher & Paykel Healthcare Investor Day
Sydney, October 2017