

Full Year Results Presentation FY2020 For twelve months ended 31 March 2020



Disclaimer

The information in this presentation is for general purposes only and should be read in conjunction with Fisher & Paykel Healthcare Corporation Limited's (FPH) Annual Report 2020 and accompanying market releases. Nothing in this presentation should be construed as an invitation for subscription, purchase or recommendation of securities in FPH.

This presentation includes forward-looking statements about the financial condition, operations and performance of FPH and its subsidiaries. These statements are based on current expectations and assumptions regarding FPH's business and performance, the economy and other circumstances. As with any projection or forecast, the forward-looking statements in this presentation are inherently uncertain and susceptible to changes in circumstances. FPH's actual results may differ materially from those expressed or implied by those forward-looking statements.



Full year business highlights

+ IMPACTED

the lives of approximately 16 million patients around the world, including many with COVID-19 in hospital

+ LAUNCHED

the F&P Evora™ compact nasal mask for OSA in New Zealand, Australia, Europe and Canada

+ EXPANDED

release of the F&P 950[™] heated humidification system in Europe and the F&P Vitera[™] mask in the US

+ COMMEMORATED

fifty years of care with employee events around the globe

+ OPENED

new sales offices in Poland and Mexico, with our own dedicated sales teams promoting products in hospitals

+ INCLUDED

in the FTSE4Good and Dow Jones Sustainability Indices for 2019



Impact of COVID-19

- Our people
 - Priority has been ensuring the safety of our people, and therefore protect our ability to manufacture, supply and train end users on essential respiratory support
 - Since January 2020, have hired 548 additional direct manufacturing staff in NZ and 518 additional direct manufacturing staff in Mexico
 - Our people have gone above and beyond
 - Provided additional leave and profit sharing bonus to recognise the incredible efforts of our people
- Hospital product group
 - Publication of 14 clinical papers on use of nasal high flow on COVID-19 patients and inclusion in global clinical guidelines¹ has encouraged the early use of NHF
 - Doubling and, in some instances, tripling of output for some of our hospital hardware products over just a few months
 - H2 FY20 hardware growth of 53% CC
 - Brought forward capex spend for new product tooling and manufacturing capacity



Key full year financial results

FY20 (for 12 months ended 31 March 2020)

	% of Revenue	NZ\$M	△PCP [^]	△CC *
Operating revenue	100%	1,263.7	+18%	+14%
Hospital operating revenue	63%	801.3	+25%	+21%
Homecare operating revenue	36%	457.3	+9%	+4%
Gross margin / Gross profit	66%	835.8	-73bps	-150bps
SG&A	27%	338.0	+3%	-1%
R&D	9%	118.5	+18%	+18%
Total operating expenses	36%	456.5	+7%	+3%
Operating profit	30%	379.3	+30%	+21%
Profit after tax	23%	287.3	+37%	+30%

Recurring items, consumables and accessories approximately 85% of operating revenue (FY19: 86%)



Hospital product group



HEALTHCARE

Hospital product group - H2 FY20 results

HOSPITAL OPERATING REVENUE H2 FY20 \$447.7M

65%

OF OPERATING REVENUE

NZ\$

CONSTANT CURRENCY



 $\uparrow 30\%$

NEW APPLICATIONS* CONSUMABLES REVENUE

NZ\$



CONSTANT CURRENCY



 New applications consumables* made up 65% of H2 FY20 Hospital consumables revenue, 63% in H1 FY20

 Strong customer demand for our Optiflow and AIRVO systems, driven by clinical trial results and COVID-19

 Hospital hardware growth of 53% in H2 FY20 in constant currency



Homecare product group



HEALTHCARE

Homecare product group – H2 FY20 results

HOMECARE OPERATING REVENUE H2 FY20 \$242.6M OF OPERATING 35% REVENUE NZ\$ 15% $\uparrow 9\%$ CONSTANT CURRENCY MASKS REVENUE 15% NZ\$ 9% CONSTANT CURRENCY

- Home Respiratory Support business continues to grow well
- Strong H2 FY20 growth in OSA masks
- F&P Vitera OSA mask launched in the US in October 2019
- Released F&P Evora February, receiving US regulatory clearance in June 2020





New lease accounting standard impact (IFRS 16)

Opening adjustment to Balance Sheet at 1 April 2019 (NZ\$M)	Prior to adoption	Impact	Adjusted after adoption
Property, plant & equipment	601.4	29.4	630.8
Deferred tax assets	38.9	1.5	40.4
Lease liabilities	-	35.2	35.2
Retained earnings	549.2	(3.8)	545.4
FY20 impact to Income Statement (NZ\$M)	Prior to adoption	Impact	Adjusted after adoption
Rental and lease expenses	13.1	(12.2)	0.9
Depreciation and amortisation	50.9	10.1	61.0
Operating profit	377.2	2.1	379.3
Financing expense	2.1	1.8	3.9
Tax expense	83.1	0.1	83.2
Net profit after tax	287.1	0.2	287.3
FY20 impact to Statement of Cash Flows (NZ\$M)	Prior to adoption	Impact	Adjusted after adoption
Cash flows from operating activities	311.7	9.7	321.4
Cash flows from financing activities	(149.3)	(9.7)	(159.0)



Gross margin



GROSS MARGIN

- Gross margin for the full year:
 - decreased by 73 bps to 66.1%
 - decreased by 150 bps in constant currency
 - decrease primarily driven by an increase in freight cost as a result of COVID-19 and first full year of costs of our second Mexico manufacturing facility (first products shipped late in the financial year)
 - partially offset by favourable product mix



Operating margin



– – - Long term operating margin target

Operating expenses

• NZ\$456.5M, +7% (+3% CC)

Research & Development expenses

- NZ\$118.5M, +18% (+18% CC)
- Reflecting underlying growth and timing of R&D projects
- Long term plan to grow in line with constant currency revenue growth

Selling, General & Administrative expenses

- NZ\$338M, +3% (-1% CC)
- Patent litigation expenses of NZ\$23.4M were incurred in FY19



Interest and Tax

Financing expense	FY19 NZ\$M	FY20 NZ\$M	Change NZ\$M
Interest income	3.3	2.2	(1.1)
Lease interest expense	-	(2.1)	(2.1)
Interest expense	(2.5)	(1.8)	0.7
FX loss on interest bearing liabilities	(2.2)	(7.1)	(4.9)
Net financing expense	(1.4)	(8.8)	(7.4)
	=>//0		
Tax and R&D grant changes	FY19	FY20	Change
	NZ\$M	NZ\$M	NZ\$M
Reintroduction of building tax depreciation (Tax expense)	-	5.3	5.3
R&D tax credit* (Tax expense)	-	13.4	13.4
Callaghan growth grant (Other income)	3.6	-	(3.6)
Net profit after tax	3.6	18.7	15.1

Cash Flow and Balance Sheet

	FY19 NZ\$M	FY20 NZ\$M
Operating cash flow	253.3	321.4
Capital expenditure (including purchases of intangible assets)	133.3	170.7
Lease liability payments	-	9.7
Free cash flow	120.0	141.0
	5)/10	51/00
	FYI9 NZ\$M	FY20 NZ\$M
Net cash /(debt) (including short-term investments)	54.4	42.2
Total assets	1,206.7	1,435.0
Total equity	913.2	973.8
Pre-tax return on average total assets	26.1%	28.1%
Pre-tax return on average equity	34.8%	39.3%
Gearing (net debt/net debt + equity)*	-6.7%	-4.3%
14 * Calculated using net interest bearing debt (debt less cash and cash equivalents) to net interest-bearing debt and equity (less hedge res	serve).	

Capital management and Dividend

- Expanded previous dividend policy into a broader capital management policy. Priority to appropriately invest in the business to support long term sustainable growth.
- Target gearing ratio* of +5% to -5% debt to debt plus equity
- Increased final dividend by 15% to 15.50 cps fully imputed (gross dividend of NZ 21.53 cps). 2.7353 cps non-resident supplementary dividend
- Total dividend for the year increased by 18% to 27.50cps



Gearing ratio as at 31 March 2020 was -4.3%



Foreign exchange effects

• 49% of operating revenue in USD (FY19: 50%) and 19% in € (FY19: 19%).

			Year to 31 Ma	irch		
Hedging position for our main exposures	FY21	FY22	FY23	FY24	FY25	FY26-28
USD % cover of expected exposure	85%	60%	45%	35%	35%	-
USD average rate of cover	0.652	0.652	0.637	0.630	0.624	-
EUR % cover of expected exposure	85%	60%	50%	35%	35%	5%
EUR average rate of cover	0.551	0.536	0.518	0.509	0.502	0.470
Hedging cover percentages have been rounded to the nearest 5%						
Reconciliation of constant currency to actual income statements				FY19 NZ\$M		FY20 NZ\$M
Profit after tax (constant currency)				204.3		265.0
Spot exchange rate effect				5.5		24.8
Foreign exchange hedging result				(1.3)		(5.6)
Balance sheet revaluation				0.7		3.1
Profit after tax (as reported)				209.2		287.3
					Fish	er & Pavke

Revenue and expenses by currency

FY20 (for 12 months ended 31 March 2020)





Outlook FY2021

- Strategic direction remains consistent
- For the first three months of FY21:
 - Hospital hardware growth >300% and Hospital consumables growth >33% on PCP
 - Homecare growth closer to FY20 full year rate of growth in Homecare

Guidance assumptions (note these are not a forecast or a prediction of the course of COVID-19):

- Respiratory hospitalisations peak Q1 due to COVID-19, return to normal by beginning of H2
- OSA diagnosis rates lower in H1, returning to normal by H2
- Freight costs remain at elevated levels through end of 2020
- Exchange rates of NZD:USD 0.64, NZD:EUR 0.57
- For FY21, based on the assumptions listed above:
 - Operating revenue approximately NZ\$1.48 billion
 - Net profit after tax approximately NZ\$325 million to NZ\$340 million
- Capital expenditure expected to be approximately NZ\$160 million
 - Manufacturing capacity and new product tooling brought forward



Key Financials



Key full year financial results

FY20 (for the 12 months ended 31 March 2020)

	NZ\$M	△PCP^	△CC *
Operating revenue	1263.7	+18%	+14%
Hospital operating revenue	801.3	+25%	+21%
Homecare operating revenue	457.3	+9%	+4%
Hospital new applications consumables revenue		+27%	+23%
OSA masks revenue		+8%	+4%
Gross margin (basis points decrease)		-73bps	- 150bps
Net profit before tax	370.5	+27%	+20%
Net profit after tax	287.3	+37%	+30%



Key second half financial results

H2 FY20 (for the 6 months ended 31 March 2020)

	NZ\$M	△PCP [^]	△CC *
Operating revenue	692.8	+24%	+18%
Hospital operating revenue	447.7	+30%	+24%
Homecare operating revenue	242.6	+15%	+9%
Hospital new applications consumables revenue		+29%	+23%
OSA masks revenue		+15%	+9%
Gross margin (basis points decrease)		- 156bps	-290bps
Net profit before tax	210.8	+36%	+24%
Net profit after tax	166.1	+49%	+35%



Overview



Ye

Fisher & Paykel Healthcare at a glance

Global leader in respiratory humidification devices

- Medical device manufacturer with leading positions in respiratory care and obstructive sleep apnea
- Over 50 years' experience in changing clinical practice to solutions that provide better clinical outcomes and improve effectiveness of care
- Estimated NZ\$20+ billion and growing market opportunity driven by demographics
- Significant organic long-term growth opportunities in respiratory care, OSA, COPD and surgery
- Large proportion (85%) of revenue from recurring items, consumables and accessories
- High level of innovation and investment in R&D with strong product pipeline
- High barriers to entry

Global presence



Strong financial performance

- Continued target, and history of, doubling our revenue (in constant currency terms) every 5 to 6 years
- Targeting gross margin of 65% and operating margin of 30%
- Growth company with a strong history of increasing dividend payments



~NZ\$20+ billion and growing market opportunity

Total addressable market estimates

HOSPITAL

~90+ million patients (including ~50+ million in Hospital Respiratory Support)*



NEW APPLICATIONS Applications outside of invasive ventilation



HOMECARE

~100+ million patients



Obstructive Sleep

* Based on US HCUP data using ICD10 codes for 2018, extrapolated to the world using healthcare spend as a % of GDP

24

Our aspiration



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



25

Markets and products

- Hospital
 - Heated humidification
 - Respiratory care
 - Neonatal care
 - Surgery
- Homecare
 - Masks
 - Flow generators
 - Data management tools
 - Respiratory care in the home

Recurring items, consumables and accessories approximately 85% of operating revenue (FY19: 86%)

REVENUE BY PRODUCT GROUP 12 MONTHS TO 31 MARCH 2020





Impact of changing demographics



—

Hospital cost breakdown





Lower care intensity = lower cost

MEAN ANNUAL COPD-RELATED MEDICAL, PHARMACY AND TOTAL COSTS BY CARE INTENSITY COHORT







Hospital





Г

Respiratory humidification

- Normal airway humidification is bypassed or compromised during ventilation or oxygen therapy
- Mucociliary transport system operates less effectively
- Need to deliver gas at physiologically normal levels
 - 37°C body core temperature
 - 44mg/L 100% saturated





Optiflow - displacing conventional oxygen therapy

CONVENTIONAL OXYGEN THERAPY

NON-INVASIVE VENTILATION



Patient groups who may benefit from Optiflow

• Emphysema

Palliative Care

Pneumonia

• Respiratory

poisoning

compromise

• Viral pneumonia

Carbon monoxide

ADULTS:

- Acute respiratory failure
- Asthma
- Atelectasis
- Bronchiectasis
- Bronchitis
- Burns
- COPD •
- Chest trauma •

PAEDIATRICS/NEONATES:

• Infant respiratory • Bronchiolitis distress

Pulmonary embolism



Clinical outcomes of Optiflow nasal high flow therapy

Optiflow NHF therapy is associated with:

ADULTS:

- REDUCED intubation⁶
- REDUCED re-intubation^{7, 8, 9}
- REDUCED bilevel ventilation⁸
- REDUCED nursing workload⁸
- INCREASED ventilator free days⁶
- IMPROVED comfort & patient tolerance⁷
- IMPROVED compliance⁷
- REDUCED COPD exacerbations¹⁰

PAEDIATRICS:

- REDUCED intubation¹¹
- REDUCED length of stay¹²
- REDUCED respiratory distress¹³

NEONATES:

- NON-INFERIORITY with nasal CPAP¹⁴
- REDUCED nasal trauma^{15, 16}
- REDUCED respiratory distress¹⁷



Optiflow NHF - a growing body of clinical evidence



- The publication of 437 clinical papers on NHF continues to signify a high level of clinical interest in the therapy
- Of the 65 controlled studies* on the use of NHF for respiratory support in adults, F&P products have been used in 60



Source: PubMed. Data in years 2000-2018 restated to be consistent with updated PubMed database

35

* Controlled studies: randomised controlled trials, non-randomised controlled trials and randomised crossover trials

Nasal High Flow in AHCRF patients**

		Comparator	Max flow rate	IMPROVES Hypercapnia	IMPROVES Respiratory Rate	REDUCED PH	IMPROVES PtCO2 / PaCO2	IMPROVES Comfort
Kim, ES ²¹ 2018	Medical ICU	СОТ	>50					
Yuste, M ²² 2019	ICU	-	>50					
Pilcher, J ²³ 2017	Medical ward	СОТ	>35		•			
Lee, MK ²⁴ 2018	Respiratory ward	NIV	60				•	
Longhini, F ²⁵ 2019	ICU	СОТ	>50				*	
Millar, J ²⁶ 2014	ED	-	>50					
Pavlov, I ²⁷ 2017	ED & Ward	-	>55					
Rittayamai, N ²⁸ 2019	ICU & Ward	-	50					

36 * No significant difference to comparator. **Select studies included in the systematic review publication by Pantazopoulos et al. 2019 AHCRF: Acute Hypercaphic Respiratory Failure (Type 2 respiratory patients)



Consistently strong growth in hospital new applications



• New applications consumables currently make up 64% of Hospital consumables revenue, up from 59% in FY18 and 62% in FY19

37







Obstructive sleep apnea

- Temporary closure of airway during sleep
- Can greatly impair quality of sleep, leading to fatigue; also associated with hypertension, stroke and heart attack
- Estimate >100 million people affected in developed countries
- Most common treatment is CPAP (Continuous Positive Airway Pressure)
 - Key issue with CPAP is compliance
 - Humidification provides significant acceptance and compliance improvements





Mask matters most

- Masks are key to compliance
- Unique, patented designs
- Vitera launched in US in October. Evora launched in NZ, Australia, Europe and Canada in February and received US regulatory clearance in June



Home respiratory support

- Chronic obstructive pulmonary disease (COPD) is a lung disease which is commonly associated with smoking
- Emphysema and chronic bronchitis are both forms of COPD
- Chronic respiratory disease, primarily COPD, is the third leading cause of death in the world¹⁸
- 6% of US adults have been diagnosed with COPD¹⁹ (~15 million people)
- 4-10% COPD prevalence worldwide²⁰ (~400 million people)
- Emerging evidence for COPD patients using NHF at home, reduced exacerbation rates¹⁰, reduced hypercapnia^{27,28}, and improved Quality of life^{10,27}.





High level of innovation and investment in R&D

- R&D represents 9% of operating revenue: NZ\$118.5M
- Product pipeline includes:
 - Humidifier controllers
 - Masks
 - Respiratory consumables
 - Flow generators
 - Compliance monitoring solutions
- 302 US patents, 430 US pending, 1,236 Rest of world patents, 1,228 Rest of world pending[†]





Growing patent portfolio



Average remaining life of FPH patent portfolio (all countries): 11.5 years*



Manufacturing and operations

- Vertically integrated
- Will grow manufacturing capacity to accommodate future volume growth
 - Modest growth in NZ
 - Most growth outside NZ

Auckland, New Zealand

- Four buildings: 110,000 m² / 1,180,000 ft²
- 100 acres / 40 hectares land
- Fourth building was completed in 2020
- Co-location of R&D and manufacturing in NZ a competitive advantage

Tijuana, Mexico

• Two buildings: 41,000 m² / 450,000 ft²



Daniell Building – the fourth building on our Auckland site, completed May 2020



Environmental Social Governance

Summary of key environmental metrics

Торіс	Description of measure	Target				
Scope 1 & 2 carbon emissions	Tonnes Co ₂ e	4.2% annual reduction from 2019 base year	70 60 OD 50 70 40 30 20			
Scope 3 carbon emissions	Tonnes Co ₂ e	SBTi supplier engagement	10 0	2018 Scope 1 & 2	2019 Scope 3 -	2020 — Total

Sustainability disclosures and indices

We participate annually in a suite of wellrespected sustainability disclosure programmes and have been included this year in the Dow Jones Sustainability Index and the FTSE4Good index.

Dow Jones Sustainability Indices

In collaboration with a RobecosAM brand

CDP (Carbon Disclosure Project) grading

Climate	Supplier engagement	Water
В	В-	C





Strong global presence

- Direct/offices
 - Hospitals, home care dealers
 - Sales/support offices in North America, Europe, Asia, South America, Middle East and Australasia, 18 distribution centres
 - ~1,000 employees in 39 countries
 - Ongoing international expansion
 - Distributors
 - +150 distributors worldwide
- Original Equipment Manufacturers
 - Supply most leading ventilator manufacturers
- Sell in more than 120 countries in total

REVENUE BY REGION 12 MONTHS TO 31 MARCH 2020





Ownership structure and listings

• Listed on NZX and ASX (NZX.FPH, ASX.FPH)







Consistent growth strategy





References

References

- 1. Clinical guidelines for use of NHF on COVID-19 patients, including those issued by the HHS, WHO, SCCM, ACEP, NIH and the CDC.
- 2. Grayson K. Vincent, Victoria A. Velkoff. The Next Four Decades. The Older Population in the United States: 2010 to 2050. US Census Bureau, 2010.
- 3. Cynthia L Ogden, Cheryl D Fryar et al. Mean Body Weight, Height, and Body Mass Index (BMI) 1960-2002. US Centers for Disease Control and Prevention, 2004.
- 4. Berhanu Alemayehu, Kenneth E Warner. The Lifetime Distribution of Health Care Costs. Health Serv Res. 2004 June; 39(3): 627–642
- 5. KeX, Agnes S et al. Public Spending on Health: A Closer Look at Global Trends. World Health Organisation2018.
- 6. Frat JP, Thille AW, Mercat A et al. High-flow oxygen through nasal cannula in acute hypoxemic respiratory failure. N Engl J Med. 2015;372(23):2185-96
- 7. Maggiore SM, Idone FA, Vaschetto R et al. Nasal high-flow versus Venturi mask oxygen therapy after extubation. Effects on oxygenation, comfort, and clinical outcome. Am J Respir Crit Care Med. 2014;190(3):282-8
- 8. Stéphan F, Barrucand B, Petit P et al. High-Flow Nasal Oxygen vs Noninvasive Positive Airway Pressure in Hypoxemic Patients After Cardiothoracic Surgery: A Randomized Clinical Trial. JAMA. 2015;313(23):2331-9
- 9. Hernández G, Vaquero C, González P, et al. Effect of Postextubation High-Flow Nasal Cannula vs Conventional Oxygen Therapy on Reintubation in Low-Risk Patients: A Randomized Clinical Trial. JAMA.2016;315(13):1354-1361. doi:10.1001/jama.2016.2711
- 10. Storgaard LH, Hockey HU, Laursen BS, Weinreich UM. Long-term effects of oxygen-enriched high-flow nasal cannula treatment in COPD patients with chronic hypoxemic respiratory failure. *Int J Chron Obstruct Pulmon Dis* 2018;16;13:1195-1205
- 11. Wing R, James C, Maranda LS et al. Use of high-flow nasal cannula support in the emergency department reduces the need for intubation in pediatric acute respiratory insufficiency. Pediatr Emerg Care. 2012;28(11):1117-23
- 12. McKiernan C, Chua LC, Visintainer PF et al. High flow nasal cannulae therapy in infants with bronchiolitis. J Pediatr. 2010;156(4):634-8
- 13. Milési C, Baleine J, Matecki S et al. Is treatment with a high flow nasal cannula effective in acute viral bronchiolitis? A physiologic study. Intensive Care Med. 2013 Jun;39(6):1088-94
- 14. Manley BJ, Owen LS, Doyle LW et al. High-flow nasal cannulae in very preterm infants after extubation. N Engl J Med. 2013;369(15):1425-33
- 15. Yoder BA, Stoddard RA, Li M, King J et al. Heated, humidified high-flow nasal cannula versus nasal CPAP for respiratory support in neonates. Pediatrics. 2013;131(5):e1482-90
- 16. Collins CL, Holberton JR, Barfield C, Davis PG. A randomized controlled trial to compare heated humidified high-flow nasal cannulae with nasal continuous positive airway pressure postextubation in premature infants. *J Pediatr*. 2013;162(5):949-54
- 17. Saslow JG, Aghai ZH, Nakhla TA et al. Work of breathing using high-flow nasal cannula in preterm infants. J Perinatol. 2006;26(8):476-80
- 18. World Health Organise (2018) The top 10 causes of death, Available at: https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death (Accessed: 24 May 2018)
- 19. Nicole M Kosacz, Antonello Punturieri et al. Chronic Obstructive Pulmonary Disease Among Adults -United States 2011. US Centers for Disease Control and Prevention, 2012.
- 20. R J Halbert, Sharon Isonaka, Dorothy George, Ahmar Iqbal. Interpreting COPD Prevalence Estimates. Chest. 2003; 123:5 1684 1692.
- 21. Kim ES, Lee H, Kim SJ, et al. Effectiveness of high-flow nasal cannula oxygen therapy for acute respiratory failure with hypercapnia. J Thorac Dis. 2018;10(2):882–888. doi:10.21037/jtd.2018.01.125.
- 22. Yuste ME, Moreno O, Narbona F, et al. Efficacy and safety of high-flow nasal cannula oxygen therapy in moderate acute hypercapnic respiratory failure. Rev Bras Ter Intensiva. 2019; 31(2):156–163. doi:10.5935/0103-507X.20190026.
- 23. Pilcher J, Eastlake L, Richards M, et al. Physiological effects of titrated oxygen via nasal high-flow cannulae in COPD exacerbations: a randomized controlled cross-over trial. Respirology 2017; 22(6):1149–1155. doi:10.1111/resp.13050.
- 24. Lee MK, Choi J, Park B, et al. High flow nasal cannulae oxygen therapy in acute-moderate hypercapnic respiratory failure. Clin Respir J. 2018;12(6):2046–2056. doi:10.1111/crj.12772..
- 25. Longhini F, Pisani L, Lungu R, et al. High-flow oxygen therapy after noninvasive ventilation interruption in patients recovering from hypercapnic acute respiratory failure: a physiological crossover trial. Crit Care Med. 2019;47(6):e506–e511. doi:10.1097/ CCM.000000000003740.n
- 26. Millar J, Lutton S, O'Connor P. The use of high-flow nasal oxygen therapy in the management of hypercarbic respiratory failure. Ther Adv Respir Dis. 2014;8(2):63–64. doi:10.1177/1753465814521890...
- 27. Pavlov I, Plamondon P, Delisle S. Nasal high-flow therapy for type II respiratory failure in COPD: a report of four cases. Respir Med Case Rep. 2017;20:87–88. doi:10.1016/j.rmcr.2016.12.006.
- 28. Rittayamai N, Phuangchoei P, Tscheikuna J, et al. Effects of high-flow nasal cannula and non-invasive ventilation on inspiratory effort in hypercapnic patients with chronic obstructive pulmonary disease: a preliminary study. Ann Intensive Care. 2019; 9(1):122doi:10.1186/s13613-019-0597-5.

