

Pitching

Breathing Management

Experiences & Devices

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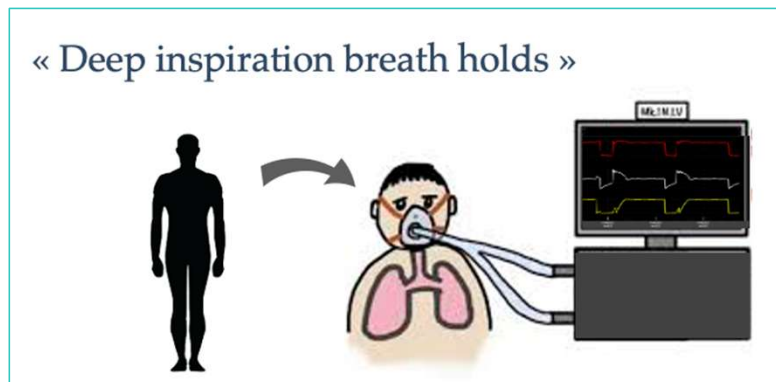
Breathing Control for Motion Management
in Radiotherapy and Imaging

MANIV-DIBH

by



BELLAVISTA ventilator – ZOLL (Arseus) Ventilator used for invasive and non-invasive ventilation



Research (2016) >> >> Clinical practice [2023, →

• From **MOTION** management to **BREATHING** management

- **2016** : development phase
 - **2017**: MRI trial with volunteers
 - **2018**: MRI trial with patients without treatment
 - **2020**: CBCT/kvCT trial with patients treated with MANIV
 - Breast cancer patients
 - Liver and lung cancer patients
 - **December 2023** : Clinical implementation in liver SABR



MANIV-Shallow (30 bpm)

MANIV-DIBH (3 bpm)



first MRI trial with volunteers (2017)



Patient selection / clinical indications

- **Abdominal** cancer patients

- Liver (> 75 patients)
- Pancreas (> 20 patients)
- Kidney
- Stomach
- Eso-gastric junction (3)

- **Thoracic** cancers

- Lung cancers (> 20 patients)

- **INcluding**

- cirrhosis (with ascites)
- BPCO Gold I-II
- Lung fibrosis (3)
- Anxiety
- 1 child (10 y)

- **EXcluding**

- Claustrophobia (3)
- Dys-synchrony (1)

MANIV-DIBH

- **Repeated controlled DIBH** fully induced by the ventilator
 - Eliminates patient-dependent reproducibility → passive for the patient
 - DIBH = no motion → IGRT gain ++
 - perpetually repeated (no free-breathing breaks) → short irradiation time
 - reproducible → reduced margin
 - good patient tolerance

- Nose and mouth covering masks

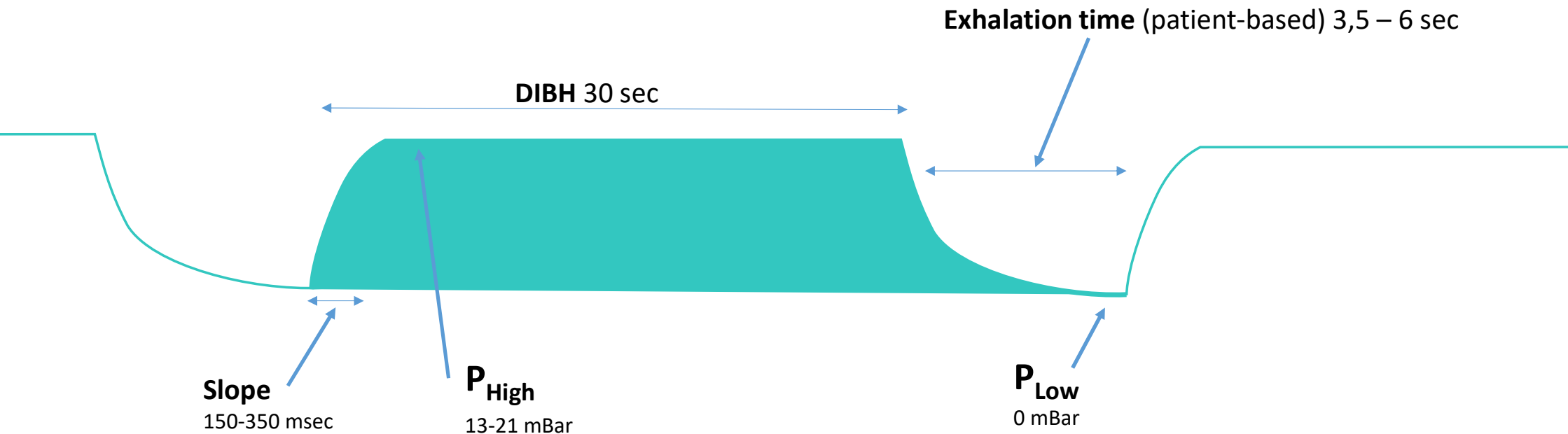
- Oxygen : FiO_2 60%
(3 min pre-oxygenation)



MANIV-DIBH settings

APRV mode

Airway Pressure Release Ventilation



Pros & Cons - BELLAVISTA®

Pros

- user-friendly interface
 - large screen → complete curves
 - remote-display
 - touch screen/mouse
- user adaptation
 - layout / alarms setting
 - only necessary information
- “mobile”
- adapted to clinical practice



Cons

- no strictly dedicated to RT
- not automatically synchronised to Linacs
- not MR-compatible

Perspectives

- Ongoing discussions with vendors
- MANIV-DIBH network ?

