

IMPLEMENTATION OF THE ELMO 1.0 IN A PRIVATE HOSPITAL IN CEARÁ: EXPERIENCE REPORT

IMPLANTAÇÃO DO ELMO 1.0 EM UM HOSPITAL PRIVADO NO CEARÁ: RELATO DE EXPERIÊNCIA

IMPLEMENTACIÓN DEL ELMO 1.0 EN UN HOSPITAL PRIVADO DO CEARÁ: INFORME DE
EXPERIENCIA

Debora de Sousa Arnaud¹
ORCID: 0000-0001-6451-560X

Marcelo Alcântara Holanda²
ORCID: 0000-0002-6002-0084

Andréa Vasconcelos¹
ORCID: 0000-0003-0688-2254

Ana Rosa Sousa¹
ORCID: 0000-0002-5043-1111

Francisco Rafael Pinheiro Dantas²
ORCID: 0000-0002-9438-6500

¹Hospital Regional Unimed
²Escola de Saúde Pública do Ceará



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ABSTRACT

To report the experience of the implementation process of the Elmo helmet in a private hospital in Fortaleza, Ceará. The implementation of the Elmo 1.0 helmet occurred in a private hospital in Fortaleza, Hospital Regional da Unimed-HRU. The implementation process occurred in stages from the acquisition of the first Elmo unit to the implementation process of Elmoterapia in the entire hospital HRU. Chronologically, from November 26, 2020 to June 31, 2021, 1,309 patients used Elmo with a success rate of 61%. In addition to the expansion of new indications of the equipment post-pandemic, it is necessary that the professional categories maintain their training of Elmotherapy, promoting a usability with safety to the team and the patient from the public health demand in Ceará and Brazil.

Descriptors: *Noninvasive Ventilation; Technology; Health Education.*

RESUMO

Relatar a experiência do processo de implantação do capacete Elmo em um hospital privado, em Fortaleza, Ceará. A implantação do capacete Elmo 1.0 ocorreu em um hospital privado de Fortaleza, o Hospital Regional da Unimed-HRU. O processo de implantação ocorreu em etapas desde a aquisição da primeira unidade Elmo até o processo de implantação da Elmoterapia em todo o complexo hospitalar do HRU. Cronologicamente, do dia 26 de novembro de 2020 a 31 de junho de 2021, 1.309 pacientes usaram o Elmo, com uma taxa sucesso de 61%. Além da ampliação de novas indicações do equipamento pós-pandemia, é necessário que as categorias profissionais mantenham seus treinamentos de Elmoterapia, promovendo uma usabilidade com segurança à equipe e ao paciente, a partir da demanda de saúde pública no Ceará e no Brasil.

Descritores: *Ventilação Não Invasiva; Tecnologia; Educação em Saúde.*

RESUMEN

Relatar la experiencia del proceso de implantación del capacete Elmo en un hospital privado, en Fortaleza, Ceará. La implantación del dispositivo Elmo 1.0 tuvo lugar en un hospital privado de Fortaleza, el Hospital Regional de Unimed-HRU. El proceso de implantación se produjo por etapas, desde la adquisición de la primera unidad Elmo hasta el proceso de implantación de la Elmoterapia en toda la UH del hospital. Cronológicamente, desde el 26 de noviembre de 2020 hasta el 31 de junio de 2021, 1.309 pacientes utilizaron Elmo con una tasa de éxito del 61%. Además de la expansión de nuevas indicaciones del equipo post-pandémico, es necesario que las categorías profesionales mantengan su entrenamiento de Elmoterapia, promoviendo una usabilidad con seguridad al equipo y al paciente a partir de la demanda de salud pública en Ceará y Brasil.

Descriptorios: *Ventilación no Invasiva; La Tecnología; Educación para la Salud.*

Autor Correspondente:

Debora de Sousa Arnaud
deborarnaud@yahoo.com.br

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INTRODUCTION

Covid-19 is a respiratory tract infection caused by an emerging new coronavirus that was first recognized in Wuhan, China, in December 2019. Currently, the World Health Organization (WHO) has defined the infection as a pandemic⁷.

While most people with Covid -19 develop mild symptoms, 14% develop a severe form that requires hospitalization and oxygen therapy, and 5% may need admission to an intensive care unit^{1,6}.

The management of respiratory failure by Covid-19 is quite challenging, with non-invasive ventilatory support strategies, measures to minimize aerosolization, available beds, collapse of the worldwide mechanical ventilator industry in view of the growing need for its use¹.

Another peculiar aspect of the COVID-19 pandemic is the overwhelming number of patients who need respiratory assistance, causing a shortage of ICU beds. Thus, physicians, nurses and physiotherapists have been required to apply non-invasive ventilation in regular hospital wards^{1,4}.

The positive benefit of non-invasive ventilation (Helmet helmet) is the continuous positive airway pressure (CPAP) mechanism, which may be crucial to improve hypoxemia and prevent the progression of lung injury during spontaneous breathing³.

Inspired by models from the literature, Elmo 1.0 is composed of a transparent PVC capsule, silicone seal applied to the neck attached to a rigid base injected in polypropylene. Insufflation and exhalation inlets direct gas into and out of the Elmo 1.0. As it is not invasive, it prevents leaks and droplet dispersion, as well as offering 10-15 cmH₂O CPAP levels, presenting a series of interesting attributes for use in patients with COVID-19 who require oxygen therapy².

Faced with this reality, it was also necessary to understand the new reality that health professionals were inserted in and to reorganize the way they work, optimizing interventions and the relationships of the learning process in the care work environment⁵.

This experience report has as its guiding question the innovation mechanisms and implementation strategies of a new hospital medical device (Helmet Elmo 1.0) in the private health service. Thus, it is questioned what are the adequate, quick and resolute ways to implement a new medical article in a private hospital service in the COVID-19 pandemic?

Based on this premise, this study brings as scientific justification and social relevance a

contribution to the strategy of the deployment process of the Elmo 1.0 device in a pandemic context.

The study had as general objective to report the experience of the implantation process of the Elmo helmet in a private hospital, in Fortaleza, Ceará.

METHODS

SCENARIO/PERIOD

The implantation process of the Elmo 1.0 helmet took place in a private hospital in Fortaleza, the Hospital Regional da Unimed-HRU. The process began on November 26, 2020, in the hospital's respiratory care unit (UCR).

RESULTS

Since the second wave was already presenting itself significantly, boosting the opening of beds in Intensive Care Units-ICU, the composition of more teams became an increasingly worrying fact. Parallel to this reality of the 2nd wave, the Elmo Cpap 1.0 helmet is approved, arriving at the Unimed-HRU Regional Hospital with great prospects.

In this context, the coordination of the physiotherapy service in the person of the physiotherapist Debora de Sousa Arnaud, supported by the institution's senior management, boosted the rapid and strategic planning for the process of implanting the Elmo 1.0 helmet at the Unimed Regional Hospital, which took place in some steps:

1ª STAGE: ACQUISITION OF THE FIRST ELMO 1.0 HELMET

The first patient admitted to the HRU, selected to wear the Elmo 1.0 helmet, was a 77-year-old man diagnosed with Acute Respiratory Failure. He started Elmotherapy on November 26, 2020 at the Respiratory Care Unit (UCR).

This experience was made possible by the donation of the Elmo helmet by the Federation of Industries of the State of Ceará-FIEC system, represented by its president, Mr. Ricardo Cavalcante, as until then the marketing of the device had not been started by the manufacturing industry, the Esmaltec, with the process being carried out by the pulmonologist and creator of the helmet, Dr. Marcelo Alcântara Holanda.

2ª STAGE: TRAINING IN THE USE OF THE ELMO 1.0 HELMET

After this solemn moment of donation, a training meeting was organized with theoretical and practical alignment, led by Dr. Marcelo Alcântara, on the Elmo helmet for ICU physiotherapists, on-call and daily physicians, nurses and nursing technicians.

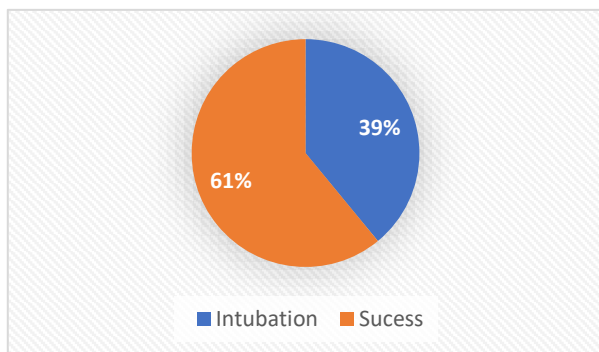
3rd STAGE: IMPLEMENTATION OF ELMO IN THE HRU

The use of Elmo 1.0 in an ICU environment was the initial choice for being a place that offered continuous assistance and surveillance to ensure safe therapy. Physiotherapists Debora Arnaud and Andrea Vasconcelos followed the patient for the first 24 hours, staying in Elmo 1.0 for six consecutive days intermittently. Given the reality that imposed agility and resolution, the protocol was drawn up, as well as the admission and monitoring forms to compile the patient.

And over the days and months, we faced a substantial increase in patients affected by the disease, which pushed us to open new beds. With our maximum installed capacity of 336 beds, we admitted 722 patients, 279 in ICU and 197 on mechanical ventilation. Fourteen more ICU beds were opened, an exclusive Covid-19 emergency room and the expansion of four wings in the field hospital with 98 beds and the wards (4th, 5th, 6th and 7th floor) was carried out. In all scenarios, Elmo was used.

Chronologically, from November 26, 2020 to June 31, 2021, 1,309 Helms were used, with a success rate of 61%.

Graph 1 – Evolution of Elmotherapy.



Source – Hospital Regional Unimed – HRU.

In view of everyone's efforts, we reached the widespread implementation process. We had a hospital complex for Elmotherapia, which allowed us to dare with different special situations: patient in pronation; in the bath; in imaging exams (CT); in intra-hospital transfers; in motor physiotherapy; in treadmill use. Not to mention the existence of different patient profiles: obese, renal failure, claustrophobic, pregnant, panic disorder, anxious, depressed. Despite everything, we managed to

give back to the patient, even if not in its entirety, something of paramount importance, life.

DISCUSSION

The peculiarities that the COVID-19 pandemic brought were strong evidence of the need to unite technology and innovation, education and management for a challenging scenario of care in any hospital complex, whether public or private.

In this context, a helmet-type interface system with complete sealing and respiratory isolation of the patient's head, allows the application of positive pressure in the airway without intubation, with safety and comfort for patients with mild to severe acute respiratory failure. Inspired by models in the literature, Elmo Cpap1.0 has a series of attributes that make it especially interesting for use in patients with COVID-19 who require oxygen therapy.^{2,3}

FINAL CONSIDERATIONS

This was the scenario that the group of professionals from the Unimed Regional Hospital experienced to share their strategies and actions in the process of implementing Helmet Elmo 1.0. Here, work with a task force, involving different collaborators, generated the possibility of strengthening teamwork, approaching and advancing the knowledge of the attributions and competencies of the professional categories involved.

More studies and experiences are needed to strengthen and expand the applicability of Elmo 1.0. In addition to the expansion of new indications for post-pandemic equipment, it is essential that professional categories maintain their training in Elmotherapy.

It is expected to continue the usability of this type of non-invasive ventilatory therapy and with its promising prospects for improvements in the Elmo 1.0 device, safely and successfully based on the public health demand of the State and Brazil.

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