CASE REPORT

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# Manual on wound care after open-window thoracostomy

## *Manual sobre cuidados com a ferida pós-pleurostomia aberta*

## *Manual sobre cuidados con herida pospleurostomía abierta*

*Alcione de Jesus Gonçalves Santana[1,*], Leila Blanes[2], Christiane Steponavicius Sobral[2], Lydia Masako Ferreira[2]*

ORCID IDs

Santana AJG https://orcid.org/0000-0003-4169-5243
Blanes L https://orcid.org/0000-0002-6922-7719
Sobral CS http://orcid.org/0000-0003-3924-147X
Ferreira LM https://orcid.org/0000-0001-6661-1830

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## ABSTRACT

**Objective:** To produce and validate a manual on wound care after open-window thoracostomy for healthcare professionals. **Methods:** This is an experience report. Initially, articles in Portuguese, Spanish and English were selected from 2010 to 2018 in the Cochrane, SciELO, LILACS, PubMed and Google Academic databases and search sites for the development of the material. The following descriptors were used: "thoracotomy", "thoracostomies", "thoracic cavity", "pleura", "pleural cavity", "injuries and lesions". After consultation, the text was prepared, followed by illustrations and layout design. The completed manuscript was sent to experts for validation. The content validity index (CVI) was used to validate the manual. **Results:** The manual developed has thirty-six pages and seven chapters with the following themes: introduction, wound care after open-window thoracostomy, wound cleansing/debridement, dressings, care record, final considerations, and bibliography. **Conclusion:** It was possible to develop and validate a manual on wound care after open-window thoracostomy for the consultation of health professionals.

**DESCRIPTORS:** Enterostomal therapy; Thoracotomy; Thoracostomy; Thoracic cavity; Pleural Cavity; Injuries and lesions.

1. Universidade de São Paulo – Hospital das Clínicas da Faculdade de Medicina – Divisão de Enfermagem – São Paulo (SP), Brazil.
2. Universidade Federal de São Paulo – Escola Paulista de Medicina – Departamento de Cirurgia – São Paulo (SP), Brazil.
*Correspondence author: alcione.goncalves@hc.fm.usp.br

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## RESUMO

**Objetivo:** Produzir e validar um manual sobre cuidados com a ferida pós-pleurostomia aberta para profissionais de saúde. **Métodos:** Trata-se de um relato de experiência. Inicialmente, foram selecionados artigos em português, espanhol e inglês no período de 2010 a 2018 nas bases de dados bibliográficos e sites de busca da Cochrane, SciELO, LILACS, PubMed e Google Acadêmico para o desenvolvimento do material. Foram utilizados os descritores: "toracotomia", toracostomias", "cavidade torácica", "pleura", "cavidade pleural", "ferimentos e lesões". Após consulta, o texto foi elaborado, seguido das ilustrações e a diagramação. O manuscrito concluído foi encaminhado aos especialistas para validação. O índice de validade de conteúdo (IVC) foi utilizado para validar o manual. **Resultados:** O manual desenvolvido possui trinta e seis páginas e sete capítulos com os seguintes temas: introdução, cuidados com a ferida pós-pleurostomia aberta, limpeza da ferida/debridamento, coberturas, registro dos cuidados, considerações finais e bibliografia. **Conclusão:** Foi possível desenvolver e validar um manual de cuidados com a ferida pós-pleurostomia aberta para a consulta de profissionais de saúde.


**DESCRITORES:** Estomaterapia; Toracotomia; Toracostomia; Cavidade Torácica; Cavidade Pleural; Ferimentos e lesões.


## RESUMEN

**Objetivo:** Elaborar y validar un manual sobre cuidados con herida pospleurostomía abierta para profesionales de la salud. **Métodos:** Se trata de un informe de experiencia. En un inicio, se seleccionaron artículos en portugués, español e inglés en el periodo de 2010 a 2018 en las bases de datos bibliográficos y sitios de búsqueda de Cochrane, SciELO, LILACS, PubMed y Google Académico para el desarrollo del material. Fueron utilizados estos descriptores: «toracotomía», «toracostomías», «cavidad torácica», «pleura», «cavidad pleural», «heridas y lesiones». Después de la consulta, el texto fue elaborado, seguido de las ilustraciones y la diagramación. El manuscrito concluido fue enviado a los especialistas para validación. El índice de validez de contenido (IVC) fue utilizado para validar el manual. **Resultados:** El manual desarrollado tiene treinta y seis páginas y siete capítulos con los siguientes temas: introducción, cuidados de herida pospleurostomía abierta, limpieza de herida/desbridamiento, coberturas, registro de los cuidados, consideraciones finales y bibliografía. **Conclusión:** Fue posible desarrollar y validar un manual de cuidados de herida pospleurostomía abierta para su consulta por profesionales de la salud.


**DESCRIPTORES:** Estomaterapia; Toracotomía; Toracostomía; Cavidad Torácica; Cavidad Pleural; Heridas y lesiones.

# INTRODUCTION

Open-window thoracostomy consists of an opening surgically made in the thoracic cavity maintained for an indefinite period until the pleural space is clean and properly drained, allowing the mobility of the chest wall and diaphragm to be reestablished, lung reexpansion, promoting the normalization of respiratory function and reducing the length of stay. This period may be longer than 12 weeks of treatment[1]. No consensus was found in the literature among the authors regarding the typology and denomination of this opening; therefore, the term "wound after open-window thoracotomy" is used in this study to describe this opening. This procedure is performed for the treatment of lung diseases associated with parapneumonic pleural effusion (PPE), which is defined as the abnormal accumulation of fluid caused by lung abscess or bacterial pneumonia in the pleural cavity. This phenomenon is called pleural empyema and is characterized by the presence of pus in the originally sterile pleural space[2].

In Brazil, isolated studies estimate that between 20 and 30% of hospitalized patients develop PPE. Considering the number of hospitalizations with PPE informed by the Brazilian Ministry of Health (BMH), there were more than 7 million hospitalizations for pneumonia between 2000-2008; therefore, it can be estimated that, among these cases, about 140,000 to 210,000 were cases of PPE. Waisberg et al. reported in their study that, in the international literature, the number of cases of PPE that can evolve into complicated PPE or pleural empyema reaches 10%[2,3].

Some cases can be surgically approached with lung resection, with partial (anatomic and nonanatomic segmentectomy, wedge or perinodular resection, lobectomy and bilobectomy) or total lung withdrawal (pneumonectomy). The surgical technique of partial and/or total lung resection consists initially of resection of the costal segment of the second or third rib, making a pleurocutaneous flap with wide displacement of the skin in order to suture it to the pleura, keeping the cavity open[1].

In most cases where the surgical approach to the thoracic cavity is performed to make the wound after open-window thoracostomy, the patients remain indefinitely with the wound open. The difference in the evolution of a patient who keeps the open-window thoracostomy basically depends on whether the pleural cavity will maintain or decrease the infectious load and the production of purulent exudate[4,5].

The interventions related to the care with an open-window thoracostomy are a challenge due to the installed infectious picture that is a consequence of

the systemic fragility due to interventions such as adequate exudate drainage[4].

As topical therapy in thoracostomy, the indication of negative pressure therapy when associated with preliminary cleaning of the cavity and appropriate debridement has been used with positive results. Reduction of exudate, decrease in bacterial load and improvement of local vascularization were observed, providing decrease in length of stay[6].

Due to the lack of knowledge of many professionals in the management of a wound after open-window thoracostomy, the care process is a challenge. Few studies describe the care of this wound; so, there is a need to provide easily accessible educational material on this care in order to fill this gap, prevent complications and reduce the healing process in the shortest time possible, in addition to assisting in clinical evaluation, decision making and appropriate guidance on the care needed.

Consultation of information manuals is one of the strategies that can be used to guide and direct the conduct of nurses. These materials should be clear and objective with language appropriate to the target audience[7].

## OBJECTIVE

Produce and validate a wound after open-window thoracostomy care manual for consultation by health care professionals.

## METHODS

This is an experience report on the process of building and validating the wound after open-window thoracostomy care manual. Initially, a study for the construction of a wound after open-window thoracostomy care manual indicated for health professionals was developed, evaluated and approved by specialists.

For its elaboration, the study was divided into three phases. In the first phase, anteriority research was performed in search engines, institutions, societies and articles, in which no manual on wound care after open-window thoracostomy was found.

The keywords "manual" (manual/booklet), "pleurostomia" (thoracostomy), "pleurotomia" (thoracotomy), "cuidados" (care), were used for the search about the anteriority search in the main search sites, pages in Google, Yahoo, societies like the Brazilian Society of Thoracic Surgery (SBCT, Sociedade Brasileira de Cirurgia Torácica), the Brazilian Society of Enterostomal Therapy (Sobest, Sociedade Brasileira de Estomaterapia) and articles. No documents were found that addressed the subject of this study.

For the development of the content, a bibliographical survey was carried out for the textual elaboration and development of the manual, including the creation of the illustrations and subsequent layout by a designer. The Health Sciences Descriptors (DeCS, Descritores em Ciências da Saúde) of the Virtual Health Library (VHL) portal were used in the bibliographic survey together with their combinations in Portuguese, Spanish and English ("Thoracotomy", "Thoracostomies", "Thoracic cavity", "Pleural cavity", "Injuries and Wounds"). The sample was defined according to the following inclusion criteria: publications electronically catalogued or indexed in full in the Cochrane, PubMed, LILACS, SciELO virtual library and Google Academic search site, within the period from 2000 and 2018.

Subsequently, the manual was approved through consultation with experts. At this stage the Delphi technique was used. This technique consists of a method of obtaining opinions and information from a group of specialists on a specific subject, allowing the number of specialists to be determined directly by the phenomenon to be studied[8].

A total of 12 healthcare professionals with a title of wound or chest surgery specialist or at least one year's experience in wound care and/or chest surgery were selected[6]. The initial version of the manual was e-mailed to the experts so they could handle and evaluate it. Together with the material, a questionnaire was sent with the objective of analyzing the content of the information, its relevance and objectivity as a whole[7].

The content validity index (CVI) was used for the purpose of measuring the percentage or proportion of agreement between judges on certain aspects of the instrument. This is a technique often used in the area of health[8]. It consists of the evaluation of concordances and representativities from the application of a Likert-type scale[9]. For the present study, a questionnaire was chosen with five alternative answers for each question, presented as: 1 being the equivalent to inadequate; 2 being the equivalent to partially adequate; 3 being the equivalent to adequate; 4 being the equivalent to fully adequate; and not applicable.

After all stages of construction and validation of the manual were completed, grammar revision of all material was performed.

In the last step or finishing stage of the manual, the *International Standard Book Number* (ISBN 978-85-924321-0-2) was requested.

The work was approved by a Research Ethics Committee through opinion number 2,105,385.

## RESULTS

As a result, the manual consists of 36 pages and 18 illustrations. Fig. 1 shows a chapter in which the dressings that can be used in the treatment of the wound after open-window thoracostomy were described, highlighting the name, description, mechanism of action, main indications, and period of change.

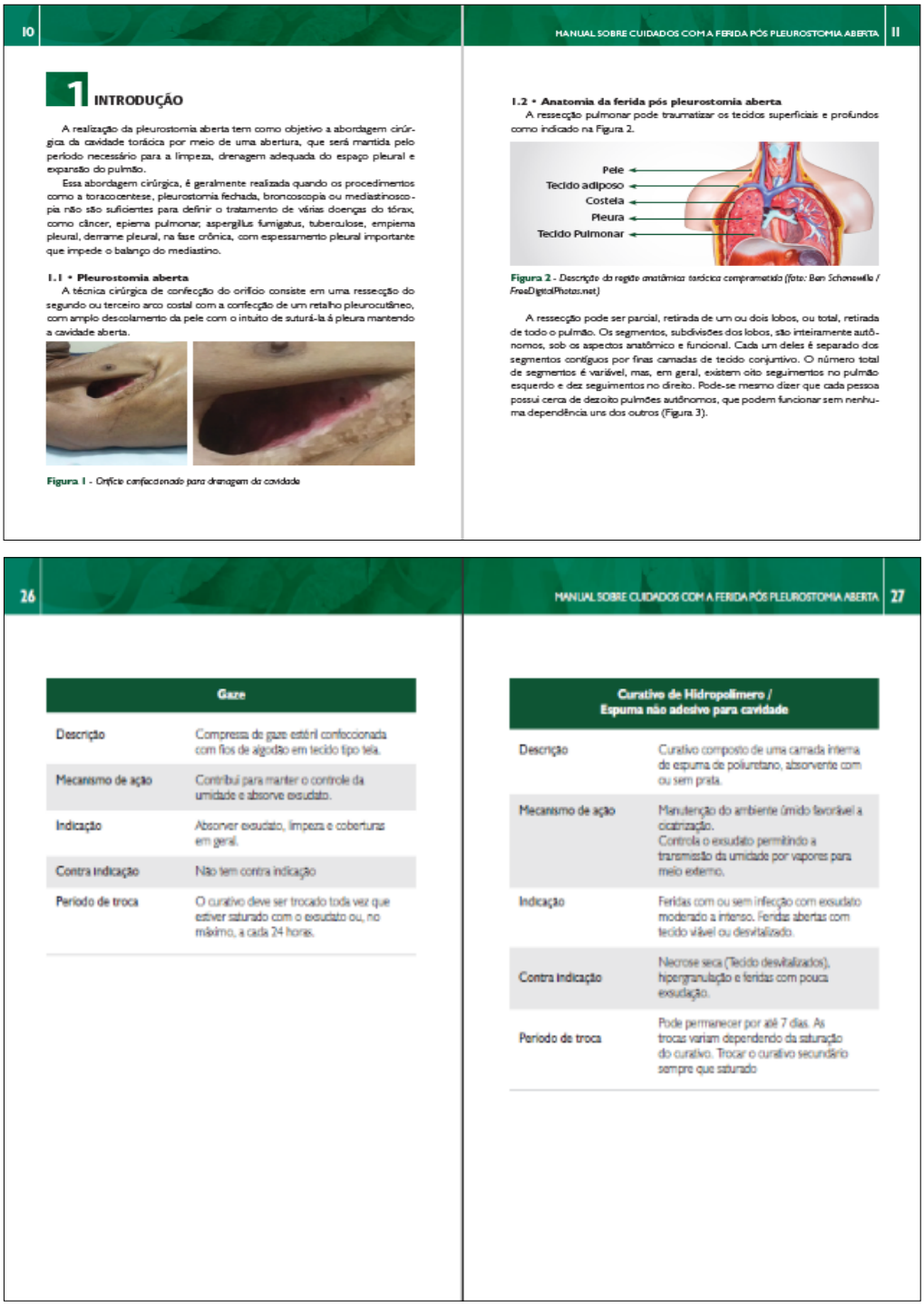


**Figure 1.** Picture from the introduction chapter and the chapter on dressings.

After analyzing the data, the responses with the "adequate" classification corresponding to item 3 or "fully adequate" corresponding to item 4 were selected. Responses with an "inadequate" classification corresponding to item 1 or "partially adequate" corresponding to item 2 and "not applicable" were excluded.

Table 1 shows the evaluations obtained in the item "Structure and Presentation" presented 47 (60%) responses as "totally adequate", 35 (41.6%) as "adequate" and 2 (2.4%) as "partially adequate". All categories and corresponding subitems have been validated, and some important suggestions have been made for the didactic improvement of this criterion. Two experts judged questions 2 and 7 under "Structure and Evaluation" as "partially adequate". In question 2 (the messages are presented in a clear and objective manner), one expert pointed out two answers, presenting no suggestions for improvement or alteration for this item; in this context, the answer was excluded. On question 7 (the information is well structured in concordance and spelling), the experts scored some typos that were punctually corrected.

Table 2 shows that 15 (53.6%) considered the content "fully adequate", 12 (42.9%) as "adequate" and 1 (3.5%) as "partially adequate". All the subitems of the category were validated after the adaptations suggested by the experts for didactic improvement of this criterion.

**Table 1.** Expert assessment for structure and presentation of the manual.

| | Structure and presentation | 1st CVI Evaluation |
|---|---|---|
| 1. | The guidelines presented in the manual are suitable to assist in planning nursing care. | 1,0 |
| 2. | The guidelines present clear and objective language. | 0,85 |
| 3. | The guidelines are scientifically grounded. | 1,0 |
| 4. | The material is suitable for the health professional, proposed target audience. | 1,0 |
| 5. | The proposed content presents a logical structure. | 1,0 |
| 6. | The material was built in a structured way with respect to concordance and spelling. | 0,85 |
| 7. | The structure of the text corresponds to the knowledge of the target audience. | 1,0 |
| 8. | There is consistency between the information on the cover, back cover and presentation. | 1,0 |
| 9. | The dimensions of the fonts used in the title and topics are adequate. | 1,0 |
| 10. | The images are relevant and in adequate quantity. | 1,0 |
| 11. | The number of pages is adequate for the content. | 1,0 |
| 12. | For the Structure and Presentation questions, some suggestions for improvement. | NA |

**Table 2.** Expert assessment on the relevance of the manual.

| | Theme relevance | 1st CVI Evaluation |
|---|---|---|
| 1. | The main aspects of the themes to be targeted were addressed. | 1,0 |
| 2. | The manual recommends the main techniques of wound care after open-window thoracostomy for the health professional. | 1,0 |
| 3. | The manual presents the strategies necessary for the health care professional to assist patients with a wound after open-window thoracostomy. | 1,0 |
| 4. | The manual is suitable for use as an educational strategy for health professionals in their activities. | 0,85 |
| 5. | For the Relevance aspect, any suggestions for improvement. | NA |

In this study, the authors chose to use the content validity index (CVI) for validating the instrument. The total CVI is calculated by considering the number of responses "3" (adequate) or "4" (totally adequate) for each item divided by the total number of responses. The total CVI value for validating a questionnaire must be greater than or equal to 0.78 when six or more validation specialists participate. The global CVI is calculated from the sum of all CVIs. This operation is performed by calculating separately the sum of each item and dividing the result by the number of items that were considered in the evaluation of the questionnaire, with a minimum compulsory agreement above 0.90 or more[9].

Overall, the level of approval of the manual by specialists was reached at 0.97 total CVI and 0.96 global CVI.

## DISCUSSION

The manual presents a set of opinions regarding treatment, consensus and guidelines for directing the use of topical therapies for chronic wounds. Interventions related to wound care after open-window thoracostomy are a challenge, due to the outcome of an installed infectious condition and the need for interventions, such as adequate exudate management[4].

In the management of the wound after open-window thoracostomy, in addition to the factors already mentioned, it is necessary to pay attention to the positioning of the patient, technique of saline solution instillation or cleaning solution and reactions such as change in breathing pattern and or discomfort during the procedure. Open-window thoracostomy aims to drain the accumulated exudate for the treatment of complicated pleural effusion that is difficult to manage, empyemas, among others. This phenomenon occurs due to the deposition of fibrous tissue on the inner surface of the pleural membranes, causing lung retention characterized by pleural thickening, which makes lung expansion impaired[10]. The study reinforces the indication that the wound may remain open for an indefinite period, depending basically on whether the pleural cavity will maintain or decrease the infectious load and the production of purulent exudate. This wound has a regeneration period of more than twelve weeks, which characterizes it as a chronic wound[11,12].

The elaboration of the *Wound after open-window thoracostomy care manual* aimed to assist health care professionals with an effective tool to guide decision making regarding wound after open-window thoracostomy care. The manual was designed to fill the gap and help nursing professionals in the management of these wounds. The use of health manuals is a teaching strategy widely used to inform and educate citizens in promoting health education. The health education manual must have adequate language and scientific basis, to meet the proposal of developing skills that help in recovery, development or maintenance of physical and mental abilities, promote health and social reintegration[13].

## CONCLUSION

It has been possible to produce, validate and make available online a manual on open-window thoracostomy wound care open to health professionals.

## AUTHOR'S CONTRIBUTION

Conceptualization, Santana AJG; Blanes L; Sobral CS; Ferreira LM ; Methodology, Santana AJG; Blanes L; Investigation, Santana AJG; Blanes L ; Writing, Santana AJG; Blanes L; Writing – Review & Editing, Santana AJG; Blanes L; Sobral CS; Ferreira LM ; Supervision, Santana AJG; Blanes L.

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