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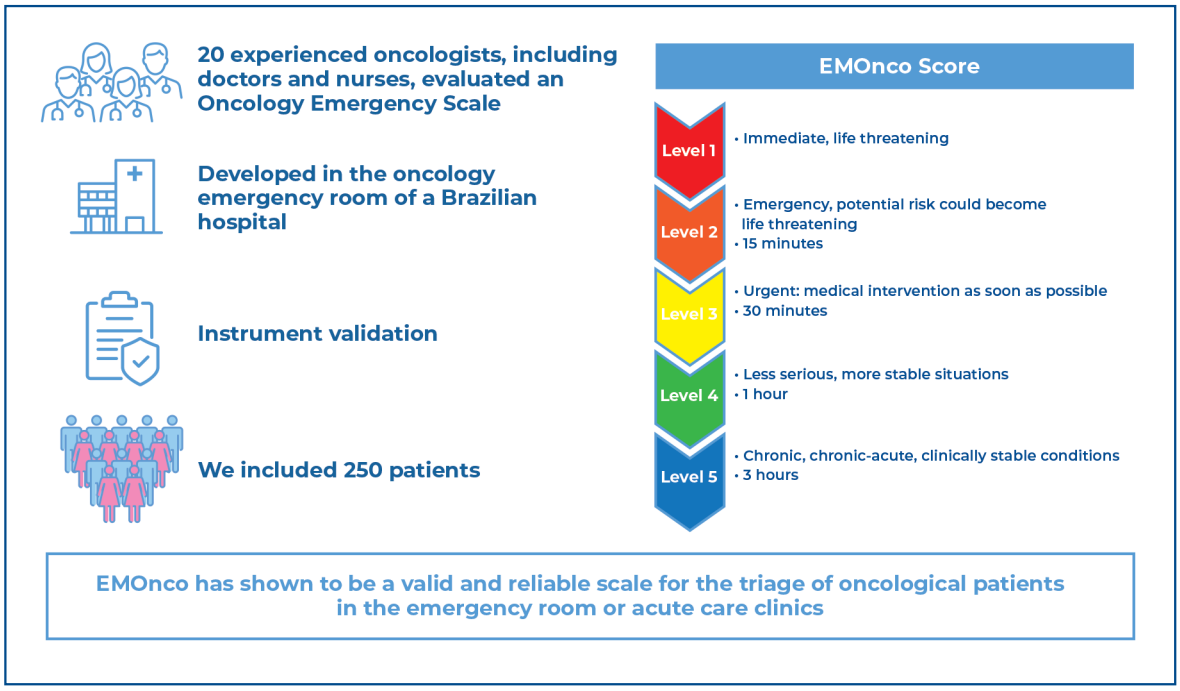
ORIGINAL ARTICLE

Construction and validation of the Emergency Oncology Scale (EMOnco), a risk rating protocol for the triage of cancer patients in acute care settings



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In Brief

Manfredini et al. demonstrate that the new rating protocol, EMOnco, can triage of cancer patients in acute care settings safely, considering their cancer type, stage and treatment histories and oncological emergencies, enabling the appropriate classification from high-risk patients to non-urgent patients.

Highlights

- EMOnco considers variables related to the cancer history and treatment.
- Triages patients in the emergency care in less than three minutes.
- Cancer patients need priority care regarding infection, and this protocol consider it.
- EMOnco has shown to be a valid and reliable scale for the triage of oncological patients in the emergency room or acute care clinics.

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ORIGINAL ARTICLE

Construction and validation of the Emergency Oncology Scale (EMOnco), a risk rating protocol for the triage of cancer patients in acute care settings

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ABSTRACT

Objective: To validate a risk rating scale for triaging of cancer patients in emergency rooms that can identify individuals needing urgent care or in imminent worsening of the clinical condition. **Methods:** This is a health instrument validation study developed in the emergency care ward of a Brazilian hospital, a referral center for cancer and hematological diseases. We built the Emergency Oncology Scale (EMOnco) based on literature review and a Delphi survey with 20 experienced oncologists (physicians and nurses). We validated the scale by assessing its construct validity, interobserver agreement and reliability after applying them in a convenience sample of all consecutive patients with cancer who visited the ward between August 2017 and January 2018. We compared the EMOnco Scores with those from other scales, used by six trained nurses: the Emergency Severity Index, the Manchester Triage System, and the Karnofsky Performance Status. We also recorded socio-demographic and clinical features and the Sequential Organ Failure Assessment (SOFA) results in the intensive care unit. **Results:** We included 250 patients with locally advanced or recurrent disease and undergoing chemotherapy. EMOnco screening took 2.24 ($\pm$ 2.9) minutes in average. The interobserver correlation coefficient was 0.9. EMOnco was highly correlated with Emergency Severity Index ($r=0.617$) and also correlated with Karnofsky Performance Status (0.420) Manchester Triage System (0.491; $p<0.001$ for all). **Conclusion:** EMOnco in Portuguese considers variables related to the cancer history and treatment and has proven to be a valid and reliable for the risk classification of oncological patients in emergency care services.

Keywords: Triage; Emergency medical services; Oncological nursing; Critical care nursing; Emergency nursing; Emergencies; Emergency services, hospital; Survey and questionnaires

INTRODUCTION

Recent developments in cancer therapy have increased patients' survival and quality of life. However, these new therapies do not come entirely without adverse events that can show up in emergency oncology services. Proper knowledge and interpretation of signs and symptoms of oncological patients presenting to the emergency ward are key for clinical approach choice.[1]

The emergency ambulatory setting can be reached by patients with and without cancer, and those under neoplastic treatment may have acute cancer complications, such as fever or embolism, and also common drug adverse events. It is essential to identify acute conditions that are expected in oncological

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patients, while rare in the overall population.[2] Patients under cancer treatment may also need rapid pain relieve when in palliative care or prompt stabilization of acute cardiorespiratory conditions. The correct differentiation of low and high-risk patients and proper triaging allow prioritization and better management of resources and waiting time.[3-6]

We have recently shown that the lack of a hospital triage tool for patients with cancer can jeopardize the treatment of patients presenting to emergency services and highlighted the need for risk classification scale for patients receiving cancer treatment. In the study, the experimental reclassification of patients by modifying the Emergency Severity Index (ESI) to remove the "cancer" feature from it. The proposed adapted scale resulted in less critical patients treated as a priority, with more severe presentations identified as high-risk.[3]

There is no hospital triage scale designed focused on patients with cancer that seek medical care in emergency rooms.

OBJECTIVE

To build and validate a tool for the specific triage of patients with oncological diseases in the emergency setting.

METHODS

Study design, setting and ethics

This is a study for the construction and validation of an instrument for the triage of patients with cancer in the emergency setting (Appendix 1). The project was conducted in *Hospital Israelita Albert Einstein*, a referral center for cancer treatment, and it was approved by the local Institutional Review Board (CAAE: 64295616.8.9999.0071; #2.967.741). Patients signed informed consent forms.

Instrument construction and face validity

Step 1: Literature review

We conducted an integrative literature review, searching for the best evidence available about triage and risk classification scales and the clinical approach for oncological emergencies. The MeSH terms "triage", "medical oncology", "hematology", "emergency service, hospital" allowed the retrieval of 31 studies in the MEDLINE database searching through PubMed. We then excluded 13 studies (2 were conference proceedings, 5 were studies not focused on oncological patients, 4 were about tools for cancer screening and 2 were for pediatric patients). We then analyzed 18 studies for the next step of the scale construction.

Step 2: Instrument construction

The literature review and our experience in oncology nursing and onco-hematological treatment allowed us to identify the preliminary fields that should compose Version 1 of the Emergency Oncology Scale (EMOnco), where quick information was needed during clinical practice. We defined thus that the tool should be built considering the following topics: patient identification, weight, allergy, vital signs, clinical description, oncological/hematological primary diagnosis, current treatment and use of catheters.

Step 3: Delphi survey and face validity

In the third step of this project, we invited specialists to participate in one round of a Delphi survey for the refinement of the scale items, and we set as inclusion criteria that the physicians should have at least 5 years of experience and be board-approved, and the nurses should have experience in oncology and emergency. All 20 experts invited agreed to participate. This committee was composed of Brazilian 5 oncologists, 5 hematologists, 5 emergency doctors, and 5 nurses specialized in oncology/hematology. Their clinical experience varied from 8 to 32 years. Of the physicians, 80% were working in the same institution, and the other 20% worked elsewhere but all had more than 20 years of experience.

We used the Google Forms platform to manage the Delphi survey. Participants received the links by e-mail to an online form with Version 1 of EMOnco. They had to respond on their concordance with the inclusion of each item by choosing one of the options: "totally agree", "partially agree", "I do not agree nor disagree", "partially disagree" and "totally disagree". When the participant showed any reluctance in agreeing with the inclusion (any option that was not "totally agree"), they should justify in a free-text box and suggest a substitution.

We reviewer the data from the Delphi survey on Version 1 and adjusted the items to create Version 2 of EMOnco.

Step 4: Piloting and content validity

We applied Version 2 to 20 patients and, according to this pilot, we added some items and adjusted the items relative to laboratorial exams, abdominal distension and pain. In a second Delphi round, the experts committee

voted on whether Version 2 was acceptable. We used the content validity index (as described below) to evaluate content validity at this point,[7] and as the value was of 1 (CVI=1), we proceeded to validation.

Validation

Patients sample and the hospital

It is suggested[8] that validation studies on health questionnaires use samples of 3 to 20 patients per item. Using this rationale, we estimated that the sample should be between 42 and 280 patients, and we set the sample in 250. We used a convenience sample of all consecutive patients who visited the emergency room between August 2017 and January 2018.

We included patients admitted to our oncology emergency center, men or women, over 18 years old, with a primary oncological diagnosis, whether or not undergoing antineoplastic treatment for the disease. We excluded patients with mental confusion at the first contact, due to the impossibility of collecting the consent form. Confusion was verified by the nurse through a quick interview where the patient had difficulty answering a question, used sedation or had a medical record of neuropsychiatric conditions registered in the medical records that would make the questionnaires impossible to respond. We also excluded patients with disabling symptoms that required immediate interventions that prevented them from being approached for interview at hospital admission.

The hospital is a referral center for oncological and hematological diseases in São Paulo, Brazil. It has 900 beds, 50 operating rooms, 28 rooms for outpatient chemotherapy and 3 linear accelerators for radiotherapy. The Center for Emergencies in Oncological and Hematological Treatment was created in 2015 and serves an average of 115 patients per month.

Questionnaires used

In addition to EMOnco, we used a socio-demographic and clinical form, created for this study, the Sequential Organ Failure Assessment (SOFA),[9] and a set of questionnaires used in the triage: the Emergency Severity Index (ESI),[10] the Manchester Triage System (MTS),[11] the Karnofsky Performance Status (KPS).[12] The socio-demographic questionnaire helped to determine the primary oncological diagnosis, and had a link with the medical record. The medical records allowed us to collect data on the final clinical outcome of each patient, and we registered it as hospital discharge, hospital admission or intensive care units (ICU) admission, and death.

SOFA[9] is widely used to check the severity of organ dysfunction in the ICU. The score is calculated according to each system (neurological, cardiovascular, respiratory, hepatic, hematological and renal), by assigning 0 to 4 points for each of these, adding up to a total score, which, when increased, indicates a higher risk of death. SOFA is regularly used by physicians in the ICU of our hospital, and we registered the SOFA Score when patients were admitted to ICU.

Emergency Severity Index was developed in 1999, for the evaluation of patients in emergency services and the projection of available resources, redirecting less severe patients to simpler areas of care and those who need prompt care or other resources (exams, procedures, hospitalization, medication infusion) to the emergency ward. ESI is easy to apply, based on the concept of risk classification, and results in a rapid stratification algorithm in 5 levels (1 - most urgent to 5 - least urgent) that allows the maximization of the patients' flow. The tool has some strategies for specific populations (psychiatry or obstetrics), but not for the oncology population.[10]

Manchester Triage System was developed in the United Kingdom in 1996 and it was translated to Portuguese and validated for the use in Brazil in 2008. This tool helps with decision making with flowcharts for each triage situation. As for ESI, the MTS scale varies from 1 to 5 (1 - most urgent to 5 - least urgent) and it also uses a color classification system, with red, amber, yellow, green and blue).[11]

Karnofsky Performance Status evaluates functional performance and if the patient is capable of carrying out daily activities.[12] The scale varies from 0 to 100, where a reduction of the score shows worsening of functional status. The KPS is widely used for decision making.

Evaluators

We trained six nurses to apply ESI, MTS, KPS and EMOnco questionnaires. Two nurses evaluated each patient for all questionnaires for further interobserver agreement analysis for the EMOnco Scale. The nurses were bling to each other's evaluations. Nurse assignments was according to work shifts.

Time

We verified the clinical utility of the scale by measuring the time to perform the triage using EMOnco, from the beginning of the patient's evaluation, to the end of the process. This variable was included considering that in emergency services, in addition to being accurate, triage tools need to be quick to apply. This time should not exceed 7 minutes.[13]

Statistical analysis

We built a database in Microsoft Excel spreadsheets (Office 365) and used SPSS (Version 17.0) for statistical analysis. This database included the expert committee evaluations for each EMOnco item according to a Likert Scale varying from 1 (strongly disagree) to 5 (strongly agree). We analyzed face and content validity through descriptive statistics, by calculating the content validity index (CVI).

According to the formula proposed by Alexandre et al.,[14] we added the scores showing agreement, 4 (partially agree) and 5 (totally agree):

$$CVI = \frac{\text{n of responses with scores 4 and 5}}{\text{Total n of responses}}$$

We considered an acceptable agreement rate as 80%. We used weighted kappa coefficient to analyze interobserver agreement for all questionnaires. We registered the time taken for applying EMOnco, and calculated the average time, standard deviation, minimum and maximum application time.

We assessed concurrent validity of EMOnco *versus* ESI and STM severity scores using the data from the 250 patients evaluated. We calculated Spearman correlations and expected them to be stronger (correlation coefficient $r>0.4$) between the most severe patients (EMOnco classification 1, ESI and STM red) and the least severe (5 in EMOnco and ESI and STM blue). We carried out the validation between known groups by comparing the KPS and the classification made by EMOnco. We expected patients with KPS <70% to be rated between scores 1 and 2 at EMOnco. We then compared EMOnco Scores with SOFA Scores and with the final clinical outcome of each patient.

Table 1. Demographic and clinical characteristics of the patients included and their Emergency Oncology Scale classification

Variable	
Sex, n (%)	
Female	149 (59.6)
Male	101 (40.4)
Age (years), average±standard deviation	68.8±15.2
Disease, n (%)	
Onco-Hematological	73 (29.2)
Solid tumors	177 (70.8)
Disease recurrence, n (%)	
No	104 (41.6)
Yes	146 (58.4)
Karnofsky Performance Status, n (%)	
≤30	6 (2.4)
40-50	50 (20)
60-70	102 (40.8)
80-90	83 (33.2)
100	9 (3.6)
Current treatment, n (%)	
Chemotherapy	123 (49.2)
Radiotherapy	8 (3.2)
Post-bone marrow transplantation	10 (4)
Hormonal therapy	13 (5.2)
Follow-up after cancer treatment	51 (20.4)
Immunotherapy	19 (7.6)
Palliative care only	24 (9.6)
Under diagnostic investigation	2 (0.8)
EMOnco Score, n (%)	
Level 1	28 (11.2)
Level 2	48 (19.2)
Level 3	63 (25.2)
Level 4	70 (28.0)
Level 5	41 (16.4)
Total	250 (100)

RESULTS

After adjustments of the preliminary list of items, we obtained 100% of agreement with the final list among the 20 experts that participated in the 2nd Delphi round. After the pilot phase, we evaluated all 250 patients using all questionnaires. Most patients were female, with locally advanced or recurrent disease and were receiving chemotherapy, as shown in table 1, for breast (14.8%), lung (9.2%) or non-Hodgkin (8%) cancer. Most patients had KPS of up to 70, indicating low functional status.

The evaluation using EMOnco was completed in 2.24 (standard deviation of 2.9) minutes in average. Table 1 shows the distribution of patients according to EMOnco average scores. Table 2 shows the results of the correlation of EMOnco with ESI and MTS. It also presents the correlation of EMOnco with the KPS Score and age, showing that EMOnco was not significantly correlated with age. The patients' sex was not significantly correlated with the scale either, as shown in table 3. The interobserver agreement was high (Table 4) for the EMOnco Scale.

Table 2. Correlations between the Emergency Oncology Scale classification and other indicators: the Emergency Severity Index, the Manchester Triage System, the Karnofsky Performance Status index and age

Variable	Correlation (r)	n	p value
ESI	0.617	250	<0.001
MTS	0.491	250	<0.001
KPS	0.420	250	<0.001
Age (year)	0.007	250	0.906

Table 3. Emergency Oncology Scale Score per sex (Mann-Whitney test)

EMOnco	Sex		Total n (%)	p value
	Female n (%)	Male n (%)		
Level 1	12 (8.1)	16 (15.8)	28 (11.2)	0.197
Level 2	35 (23.5)	13 (12.9)	48 (19.2)	
Level 3	44 (29.5)	19 (18.8)	63 (25.2)	
Level 4	38 (25.5)	32 (31.7)	70 (28.0)	
Level 5	20 (13.4)	21 (20.8)	41 (16.4)	
Total	149 (100)	101 (100)	250 (100)	

Table 4. Interobserver agreement for Emergency Oncology Scale Score

Variable	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Level 4 n (%)	Level 5 n (%)	Total n (%)	WK (95%CI)
EMOnco classification - Observer 1							
Level 1	28 (11.2)	0	0	0	0	28 (11.2)	
Level 2	0	48 (19.2)	0	0	0	48 (19.2)	
Level 3	0	0	63 (25.2)	0	0	63 (25.2)	1.000
Level 4	0	0	0	70 (28)	0	70 (28.0)	
Level 5	0	0	0	0	41 (16.4)	41 (16.4)	
EMOnco classification - Observer 2							
Level 1	26 (10.4)	0	0	0	0	26 (10.4)	0.974
Level 2	2 (0.8)	46 (18.4)	0	0	0	48 (19.2)	0.957; 0.997
Level 3	0	2	63 (25.2)	2	0	67 (26.8)	
Level 4	0	0	0	67 (26.8)	2	69 (27.6)	
Level 5	0	0	0	1 (0.4)	39 (15.6)	40 (16.0)	
Total	28 (11.2)	48	63 (25.2)	70 (28)	41 (16.4)	250 (100)	

WK: weighted kappa; 95%CI: confidence interval.

Of all 250 patients screened in the emergency ward, the majority (114; 45.6%) did not need hospital admission after EMOnco triage, while 100 (40%) were admitted to the hospital, 9 (3.6%) to the semi-intensive care ward and 27 (10.8%) to the intensive care unit. Of the 250, 111 (44%) were admitted after laboratory tests, or imaging tests (130; 52%). Patients had pain (28.4%), tiredness (11.2%), cough (10%) and fever (9%). None of the 114 patients discharged had to be readmitted in 48 hours. Of the 250 patients, 27 were admitted to the ICU, of which those with higher SOFA Scores were classified as level 1 in the EMOnco. There were 7 deaths, 2 of them due to septic shock and 5 after referral for palliative care due to disease severity. The final version is available in appendix 1. EMOnco was created in Portuguese (Version in appendix 2).

DISCUSSION

We have shown that in less than three minutes, EMOnco can provide a robust health risk assessment of the patient with cancer seeking medical care in emergency rooms. EMOnco results correlate with those from the ESI Scale, a risk classification designed to help in the emergency setting patients flow, triaging those in need of more prompt care or resources – but not specific for cancer patients. EMOnco also correlates with the KPS, identifying correctly the patients with a low performance score as those requiring more attention. And in less than 4% of cases the triaging professionals disagree, which also makes EMOnco a reliable tool.

More than 70% of patients may need acute care after starting systemic therapy for cancer[15] and about one quarter of them in the first 30 days of treatment.[16] This means that the quality of care in the emergency setting needs to be adjusted for the possibility of receiving these patients. As there was no triaging system or scale specific for cancer patients in the emergency setting, we decided to build and validate one considering the peculiarities of the disease and treatment.

The other scales used for the validation phase in this study were one of the bases of the preliminary list of items in EMOnco, to which we added more items inspired in case reports or clinical observations and also from the literature review on the most common and threatening emergencies for the oncological patient, their signs and symptoms. A study carried out in Canada[17] analyzed 43,000 visits to emergency units by cancer patients, whose main complaints were pain (20%), fever (13%) and shortness of breath (7%); data similar to the obtained by our study. The oncological population demands specific care in these aspects, since, in most cases, cancer pain is chronic and needs adequate evaluation and treatment. The investigation of fever should be performed by a professional who knows the risks of infection related to the type of therapy the patient is receiving, minimizing the mortality of this population.[18]

In EMOnco, level 1 is attributed to a patient presenting changes in body temperature during chemotherapy, post-allogeneic bone marrow transplantation or active hematological disease, as well as an individual at risk of neutropenia or with an infectious focus. This is one of the areas where EMOnco takes in consideration the characteristics of the cancer patient, and perhaps why the scale did not correlate well with STM: there is a large number of patients at risk of sepsis due to their immunosuppression used in cancer therapy, and STM does not consider that. The expert committee agreed that cancer patients really need priority care regarding infection. Early antibiotic administration is associated with a higher survival rate; studies indicate that they should be administered within 60 minutes, with some

recommending it to start within 30 minutes.[15,16] Every 1 hour of delay to start the antibiotic, there is an 18% increase in the risk of death.[19,20]

The KPS Scale might consider that a patient with low performance status needs extra support – however, it tells nothing about priority in the emergency setting, that should be based on the severity of the clinical picture or risk of death. EMOnco helps with decision making because it considers the disease history, the treatment that the patient receives, that may have particular adverse events not related to the disease. A vomit episode in a patient without cancer should not be considered the same as in the patient under chemotherapy, for example.

EMOnco should be used after adequate training of staff. During training, case discussion is essential to stimulate critical thinking. For the use of EMOnco, the service must provide a thermometer, a pulse oximeter, a watch with a hand for measuring seconds for the evaluation of respiratory and heart rate, visual analogue scales or rules for pain assessment (such as the numerical visual scale and the face scale, which contemplate the need of most adults), and an appropriate scale to check the pain of patients who are incapable of communicating. These are overall simple and inexpensive materials.

The main limitation of this validation study is that it was conducted in a private hospital, which do not reflect the reality of patients seen in the public health sector in Brazil. Because of this limitation and to further validate the scale, we are currently widening the group to at least 500 patients including two other institutions. This will give the project a more heterogeneous sample. The exclusion of confused or sedated patients also prevented the evaluation of this profile, since it was impossible to collect the consent form.

CONCLUSION

EMOnco considers variables related to the cancer history and treatment, thereby offering more safety for the health professional and possibly minimizing the risk for iatrogeny. In our clinical setting, EMOnco has shown to be a valid and reliable scale for the triage of oncological patients in the emergency room or acute care clinics.

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AUTHOR' CONTRIBUTION

Luciana Lopes Manfredini: study design, planning, data collection, analysis, manuscript drafting and approval of the final version submitted. Elisa Rossi Conte: study design, planning, data collection, and approval of the final version of the manuscript submitted. Gislene Padilha dos Santos: planning, data collection, and approval of the final version of the manuscript submitted. Eliseth Ribeiro Leão: planning, analysis, and approval of the final version of the manuscript submitted. Nelson Hamerschlak: study design, planning, analysis, and approval of the final version of the manuscript submitted.

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Appendix 1. Screening Scale for Emergency Oncology and Onco-hematology Patients (EMOnco)* (English version)

Name: _____ Birth date ___/___/____

Weight: _____ Allergy: ( ) Yes _____ ( ) No

Vital Signs:

Heart rate | Blood Pressure | SPO2 | Respiratory Rate | Temperature | Pain

Oncological/Hematological Diagnosis: _____

Clinical description:

_____

_____

_____

Current treatment:

( ) Diagnostic Investigation _____

( ) Chemotherapy/Immunotherapy Protocol: _____ Last cycle: ____/___

( ) Radiotherapy Treatment rea: _____ Fraction received: ____/_____

( ) Post-chemotherapy follow-up ( ) Post radiotherapy follow-up ( ) BMT follow-up

( ) Exclusive palliative care ( ) Hormone therapy _____

( ) Recent surgery _____ ( ) Post surgery follow-up

Catheter: ( ) No ( ) Port a cath ( ) PICC ( ) Hickman ( ) Other: _____

Level: ( ) Level 1 ( ) Level 2 ( ) Level 3 ( ) Level 4 ( ) Level 5

Isolation: ( ) No ( ) Contact ( ) Droplet ( ) Respiratory

_____ _____

Nurse identification/Sign | Date/Time

* English Version – Validation in proccess.

Description of Parameters for Assessment of Patients after Application of the Screening Scale

Level 1:
Immediate life-saving intervention required:
Time to start service: Immediate.
Criteria:
Cardiac and/or respiratory arrest, represented by the absence of pulse and/or respiratory movements, or visibly on the verge of arrest (gasping, bradycardia, unresponsiveness).
Decreased Level of Consciousness (non-responsive patient or responsive only to painful stimuli). Note: In these cases, capillary blood glucose must be checked.
Heart Rate >150 or <40, or between 120 and 149 presenting joint symptoms (chest pain, dizziness, sweating, tachypnea).
Sudden neurological changes, especially if spinal cord compression is suspected, such as decreased motor strength, plegia, paresis or intense pain in the spine region.
Severe hypoglycemia (values <60mg/dl.)
Severe hypotension (SBP <80mmHg, or DBP <60mmHg), symptomatic (dizziness, tiredness, blurred vision, sweating).
Respiratory Rate >40 or <8; cyanosis, saturation <88%; imminent need for intubation, severe respiratory failure (vigorous breathing movements, wishbone retraction, nose flaring).
Severe dehydration (accompanied by tachycardia and/or hypotension, according to criteria established above).
Patients presenting/complaining of fever (axilar >37.8 celsius or oral >38.3 celsius), undergoing antineoplastic chemotherapy, active hematological disease or post-allogeneic BMT, with suspected neutropenia, associated or not with tremors, changes in mental status or oliguria.
Patients with a suspected or confirmed infectious focus, undergoing antineoplastic chemotherapy, active hematological disease or post-allogeneic BMT, at risk of neutropenia.
Body temperature below 34.0 celsius
Allergic reaction with difficulty breathing or edema of the facial and/or neck region.
Trauma to the skull, chest, abdomen, or limb amputation, and altered vital signs.
Hemoptysis/hematemesis, enterorrhagia, melena, intense vaginal bleeding with signs of shock (hypotension – systolic blood pressure <80mmHg, tachycardia >100, sweating, tachypnea – RR>22).

Level 2:
Patients at potential risk who require rapid interventions.
Time to start the service: Up to 15 minutes.
Drowsiness (Patient responsive to call), lethargy, mental confusion.
Intense pain (VNS >7, scale of faces with intense pain).
Hemoptysis, hematemesis, enterorrhagia, melena, heavy vaginal bleeding without signs of shock.
Heart rate between 120 and 139.
Respiratory rate between 25 and 40 or between 8 and 10 rpm.
Exams from the last 48 hours showed platelets below 20,000/mm^3, neutrophils below 500/mm^3, calcium <7mg/dl or >14mg/dl, potassium >6mg/dl.
Recent seizure episode (last 24 hours), with signs of clinical deterioration (confusion, speech changes or previously unreported limb paresis).

Level 3:
Patients who require emergency medical intervention as soon as possible.
Time to start the service: Up to 30 minutes.
Moderate pain (EVN 4 to 6).
Recent seizure episode, without signs of clinical deterioration (stable signs, patient alert).
Heart rate between 101 and 119 asymptomatic.
Respiratory rate between 21 and 24.
Patient with diarrhea and/or vomiting (4 to 8 episodes), or on the verge of dehydration.
Hemoptysis, hematemesis, enterorrhagia, melena, abnormal vaginal bleeding, without changes in vital signs.

Level 4:
Less severe, stable patients.
Time to start service: Until 1:00 am.
Mild pain (VNS 1 to 3).
Patient with diarrhea and/or vomiting (up to 3 episodes), without changes in vital signs or dehydration.
Post-chemotherapy nausea, and/or up to 3 episodes of vomiting in the last 48 hours, without changes in vital signs.
Non-secretive cough, with or without runny nose, without fever.
Dizziness, without evidence of dehydration or changes in vital signs.
Difficulty defecating for >4 days, with abdominal distension or pain.
Patients complaining of fever (axilar >37.8 celsius or oral 38.3 celsius), stable vital signs, undergoing onco-hematological follow-up, post-mortem autologous/previously treated disease, not active or undergoing treatment with a hormone blocker.

Level 5:
Patients with chronic, chronic-acute conditions without potential for worsening, clinically stable.
Time to start service: Until 3:00 am.
Stable Vital Signs – Heart Rate between 50 and 100 bpm; respiratory rate between 10 and 20.
Dressings.
Request for medical prescriptions.
Chronic, non-acute pathologies.
Evaluation of laboratory or imaging test results.
Difficulty defecating for >4 days, without abdominal distension or pain.
Situations not previously covered.

The nurse may judge during the assessment that the patient needs to improve his level, according to the assessment carried out.

Appendix 2. Escala de Triagem para Pacientes Oncológicos e Onco-hematológicos (EMOnco)* **(Portuguese version)**

Nome: _____ Data de Nascimento: ___/___/____

Peso: _____ Alergia: ( ) Sim _____ ( ) Não

Sinais Vitais:

FC PA SO2 FR T' Dor

Diagnóstico Oncológico/Hematológico: _____

Descrição clínica:

_____

_____

_____

Tratamento Atual:

( ) Investigação Diagnóstica _____

( ) Quimioterapia/Imunoterapia Protocolo: _____ Último ciclo: ____/___

( ) Radioterapia Área de Tratamento: _____ Frações recebidas: ____/_____

( ) Seguimento pós quimioterapia ( ) Seguimento pós radioterapia ( ) Seguimento pós-TMO

( ) Cuidados Paliativos Exclusivos ( ) Hormonioterapia _____

( ) Cirurgia oncológica recente _____ ( ) Seguimento pós cirurgia

Cateter: ( ) Não ( ) Port a cath ( ) PICC ( ) Hickman ( ) Outros: _____

Classificação: ( ) Nível 1 ( ) Nível 2 ( ) Nível 3 ( ) Nível 4 ( ) Nível 5

Isolamento: ( ) Não ( ) Contato ( ) Gotículas ( ) Respiratório

_____ _____

Assinatura e Carimbo Data/Horário da Avaliação

* Original version in Portuguese.

Descrição dos Parâmetros para Avaliação de Pacientes após a Aplicação de Escala de Triagem

Nível 1:
Pacientes que necessitam de intervenção imediata, pois representam ameaça de morte.
Tempo para início do atendimento: Imediato.
Critérios:
Parada Cardíaca e/ou respiratória, representada pela ausência de pulso e/ou de movimentos respiratórios, ou visivelmente em iminência de parada (gasping, bradicardia, não responsivo).
Rebaixamento do Nível de Consciência (paciente não responsivo ou responsivo apenas a estímulos dolorosos). *Nota:* Nestes casos, deve-se verificar glicemia capilar.
Frequência Cardíaca >150bpm ou <40bpm, ou entre 120 a 149bpm apresentando sintomatologia conjunta (dor torácica, tontura, sudorese, taquipneia).
Alterações neurológicas súbitas, especialmente suspeitando-se de compressão medular, como diminuição de força motora, plegia, paresia ou dor intensa em região da coluna.
Hipoglicemia severa (valores <60mg/dl.)
Hipotensão severa (PAS <80mmHg, ou PAD <60mmHg), sintomática (tontura, cansaço, turvação visual, sudorese, sensação de mal-estar).
Frequência Respiratória >40irpm ou <8irpm; cianose, saturação <88%; iminência da necessidade de entubação, insuficiência respiratória grave (movimentos respiratórios vigorosos, retração de fúrcula, batimento de asa de nariz).
Desidratação grave (acompanhada de taquicardia e/ou hipotensão, *conforme critérios estabelecidos acima*).
Pacientes apresentando/*queixa de febre* (>37,8ºC), em quimioterapia antineoplásica, *doença* hematológica ativa ou pós-TMO alogênico, com suspeita de neutropenia, associado ou não a tremores, mudanças do estado mental ou oligúria.
Pacientes com foco infeccioso suspeito ou confirmado, em quimioterapia antineoplásica doença hematológica ativa ou pós-TMO alogênico, em risco de neutropenia.
Temperatura corporal abaixo de 34.0ºC.
Reação alérgica com dificuldade respiratória ou edema de região facial e/ou pescoço.
Trauma de crânio, tórax, abdome, ou com amputação de membro, e sinais vitais alterados.
Hemoptise/hematêmese, enterorragia, melena, sangramento vaginal intenso com sinais de choque (hipotensão – pressão arterial sistólica <80mmHg, taquicardia >100bpm, sudorese, taquipneia – FR>22irpm).

Nível 2:
Pacientes com risco potencial que requerem intervenções rápidas.
Tempo para início do atendimento: Até 15 minutos.
Sonolência (Paciente responsivo ao chamado), letargia, confusão mental.
Dor intensa (EVN >7, escala de faces com dor intensa).
Hemoptise, hematêmese, enterorragia, melena, sangramento vaginal intenso sem sinais de choque.
Frequência cardíaca entre 120 a 139bpm.
Frequência respiratória entre 25 a 40irpm ou entre 8 a 10irpm.
Exames das últimas 48 horas com plaquetas abaixo de 20.000/mm^3, neutrófilos abaixo de 500/mm^3, cálcio <7mg/dl ou >14mg/dl, potássio >6mg/dl.
Episódio de convulsão recente (últimas 24 horas), com sinais de deterioração clínica (confusão, alterações da fala ou paresia de membros anteriormente não referida).

Nível 3:
Pacientes que necessitam de intervenção médica de emergência tão logo possível.
Tempo para início do atendimento: Até 30 minutos.
Dor moderada (EVN 4 a 6).
Episódio de convulsão recente, sem sinais de deterioração clínica (sinais estáveis, paciente alerta).
Frequência cardíaca entre 101 a 119bpm assintomática.
Frequência respiratória entre 21 e 24irpm.
Paciente com diarreia e/ou vômitos (4 a 8 episódios), ou em iminência de desidratação.
Hemoptise, hematêmese, enterorragia, melena, sangramento vaginal anormal, sem alterações de sinais vitais.

Nível 4:
Pacientes menos graves, estáveis.
Tempo para início do atendimento: Até 1h00.
Dor leve (EVN 1 a 3).
Paciente com diarreia e/ou vômitos (até 3 episódios), sem alteração de sinais vitais ou desidratação.
Náuseas pós-quimioterapia, e/ou até 3 episódios de vômito nas últimas 48 horas, sem alterações de sinais vitais.
Tosse não secretiva, com ou sem coriza, sem febre.
Tonturas, sem evidências de desidratação ou alterações de sinais vitais.
Dificuldade para evacuar >4 dias, com distensão abdominal ou dor.
Pacientes com queixa de febre (>37,8ºC), sinais vitais estáveis, em seguimento onco-hematológico, pós-tmo autólogo/doença tratada previamente, não ativa ou em tratamento com bloqueador hormonal.

Nível 5:
Pacientes com condições crônicas, crônico-agudizadas sem potencial de piora, estáveis clinicamente.
Tempo para início do atendimento: Até 3h00.
Sinais Vitais estáveis – Frequência Cardíaca entre 50 a 100bpm; frequência respiratória entre 10 e 20irpm.
Curativos.
Solicitação de receitas médicas.
Patologias crônicas, não-agudizadas.
Avaliação de resultados de exames laboratoriais ou de imagem.
Dificuldade para evacuar >4 dias, sem distensão abdominal ou dor.
Situações não enquadradas anteriormente.
Bpm: Batimentos por minutos.
Irpm: Incursões respiratórias por minuto.

O enfermeiro pode julgar durante a avaliação que o paciente tem necessidade de elevar-se de nível, conforme a avaliação realizada.