

ORIGINAL ARTICLE

Consensus-based recommendations and proposals for improving the management of elderly emergency patients with suspected infection in the Spanish autonomous community of Valencia: the PIPA project

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Objective. To develop expert consensus-based recommendations and proposals on how to improve the care of elderly emergency patients with suspected infection in the autonomous community of Valencia.

Methods. This project was carried out in 3 phases: 1) design of a questionnaire by means of consensus among a group of experts; 2) online survey to determine the opinions of emergency physicians in the community of Valencia; and 3) drafting of expert consensus-based recommendations and proposals arising from the results of the survey. The experts used the Delphi method to reach consensus and the survey was posted online.

Results. After 2 rounds of voting, 21 emergency medicine experts reached consensus on 15 of the 30 survey items initially proposed: 4 items (26.6%) referred to patient classification and placement, 5 (33.3%) to diagnosis, and 6 (40.0%) to treatment. The resulting online questionnaire was returned by 142 (77.2%) of the 184 emergency physicians belonging to 21 hospital emergency departments in the community of Valencia. The experts reached a high level of consensus (mean score, > 7) on 11 (73.3%) of the 15 recommendations posed by the group's coordinator after the survey.

Conclusions. The experts were able to propose 11 consensus-based recommendations and proposals for improving the care of elderly patients with suspected infection in emergency departments in Valencia.

Keywords: Infection. Sepsis. Aged patients. Emergency health services.

Proyecto PIPA: consenso de recomendaciones y propuestas de mejora para el manejo del paciente anciano con sospecha de infección en los servicios de urgencias de la Comunidad Valenciana

Objetivo. Desarrollar una serie de recomendaciones y propuestas de mejora basadas en un consenso clínico de expertos sobre aspectos relacionados con la atención del paciente anciano con sospecha de infección en los Servicios de Urgencias y Emergencias (SUH-E) de la Comunidad Valenciana (CV).

Metodología. El estudio se divide en tres fases: 1) Diseño de un cuestionario por consenso de un grupo de expertos; 2) Realización de una encuesta electrónica para conocer la opinión de los médicos de urgencias y emergencias (MUyE) de la CV; 3) Elaboración de una serie de recomendaciones y propuestas de mejora por consenso de un grupo de expertos a partir de los resultados de dicha encuesta. El consenso se llevó a cabo mediante una metodología Delphi y la encuesta a través de una página web.

Resultados. Un grupo de expertos de 21 MUyE consensaron, tras dos rondas de votación, un cuestionario final de 15 preguntas de las 30 inicialmente planteadas [4 (26,6%) relativas a la clasificación y ubicación del paciente, 5 (33,3%) al diagnóstico, y 6 (40,0%) al tratamiento]. El cuestionario final fue sometido a una votación, mediante una encuesta electrónica, de 142 MUyE (77,2%) de los 184 posibles procedentes de 21 SUH-E de la CV. De las 15 recomendaciones planteadas por el grupo coordinador tras la encuesta, se alcanzó un alto grado de consenso (mediana con puntuación > 7) en 11 (73,3%) de ellas por parte del grupo de expertos.

Conclusiones. Se establecieron once recomendaciones y propuestas de mejora con un alto grado de consenso para la atención del paciente anciano con sospecha de infección en los SUH-E de la CV.

Palabras clave: Infección. Sepsis. Anciano. Urgencias.

Introduction

Infections are one of the most frequent reasons for elderly patients to visit the Emergency Department (ED) and there is a progressive increase in the incidence of sepsis in this age group^{1,2}.

The elderly patient presents a series of changes in the immune system and a greater degree of comorbidity associated with aging, favoring some immunosuppression and therefore a higher risk of infection³. In addition, the clinical presentation is frequently atypical or hardly symptomatic which hinders detection and strati-

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fication of the severity of this process by current triage systems, contributing to delays in care and increased morbidity and mortality^{4,5}.

With regard to the management of sepsis, mortality remains high in the elderly despite recent published studies showing a significant reduction in mortality attributable to the use of protocols^{6,7}. Also, there are many controversial aspects in managing this syndrome, most notably the use of central venous pressure (CVP) as a reference standard in replenishing fluids⁸, the role of new non-invasive and minimally invasive continuous recording of cardiac output⁹ or the use of ultrasound guided bedside objectives¹⁰, not only focused on pathophysiological diagnosis of the state of shock, but as a guidance tool for etiologic identification of the focus of infection.

All this, together with the great organizational variability in EDs, underlay the "Infection in the Elderly Patient Project" (PIPA in Spanish) aimed at providing structured and comprehensive management of infection in elderly patients attended at EDs in the region Community of Valencia (CV). The aim of this study was to develop a series of recommendations and suggestions for improvement based on clinical consensus of experts for care of elderly patients with suspected infection in the EDs of Valencia.

Methodology

The study was divided into three phases: 1) Designing a questionnaire by consensus of a panel of experts; 2) Conducting a survey type study to determine the opinion of emergency physicians (EPs) on questions designed by the group of experts; 3) Elaborating a series of recommendations and proposals for improvement by consensus of a group of experts from the results of this survey (Figure 1).

The first phase of the study consisted of designing a questionnaire by consensus. We used a modified Delphi method to achieve the greatest possible consensus of the group of experts in urgent attention of infectious disease. To do this, a coordinating group was created, consisting of 5 members who met the requirements of having more than 3 years' experience in Valencian EDs, being part of a hospital committee or work group related with infections and / or the use of antibiotics, having accredited experience in the use of hemodynamic monitoring and emergency ultrasound. The functions of the coordinating group were to prepare the questions, recruit and select members of the expert panel, establish the work schedule, collect and interpret results and formulate the final questionnaire. In preparing the questions, they conducted a limited literature search and review of articles published in the last 10 years in the following clinical trial databases: Medline, IME, PubMed and Cochrane Library. The keywords used were: severe sepsis, elderly, diagnosis, treatment, ultrasonography, non-invasive hemodynamic monitoring. After analyzing the material collected, 30 questions were elab-

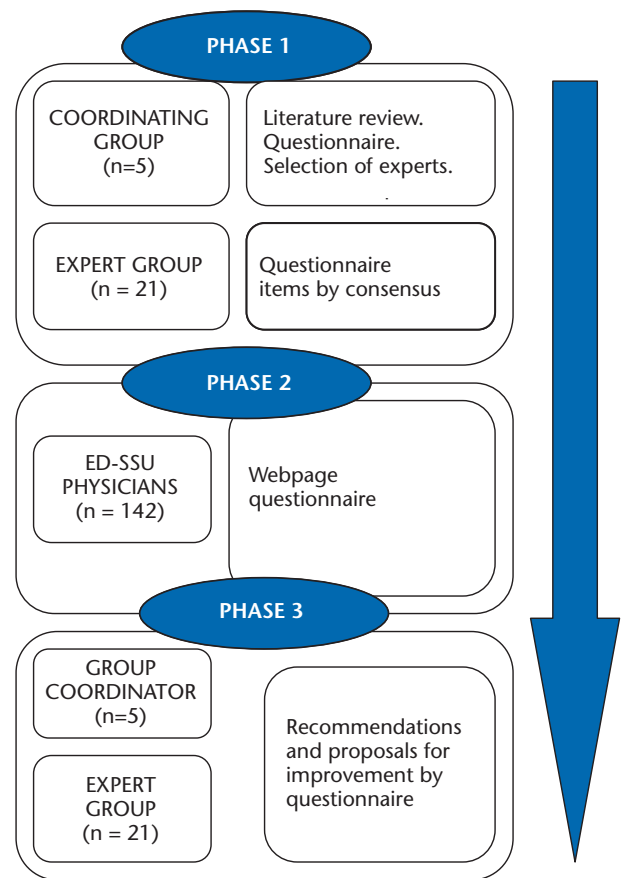


Figure 1. Study methodology. ED: emergency department; SSU: short stay unit.

orated, grouped into three specific areas of work: 1) classification and location of the patient; 2) diagnosis; 3) treatment. An expert group was set up, in accordance with level of knowledge, experience and publications on the subject, made up of 21 representatives of Valencian EDs from 24 hospitals. The expert consensus on the questions was reached after two meetings (November 1, 2013 and January 20, 2014). Intermediate results were sent at least four weeks before each meeting. Discussion on the opinions was open, as it was considered that would further enrich the debate given the disparity of criteria for management of these patients in the different EDs, although the voting was anonymous. Finally, after analyzing the results, a final questionnaire was issued.

In the second phase, we conducted a survey type study among EPs between 1 February and 31 March 2014. The survey included study questions of the final questionnaire agreed by the panel. The requested answers were: categorized explicit answers, answers in terms of percentages or scores according to a defined scale. The panel held an explanatory session in each of the 21 participating centers inviting EP staff to answer the survey voluntarily and anonymously through a website.

In the third phase the recommendations and propo-

sals for improvement were made by consensus. The same coordinating group analyzed the results of the survey and prepared a series of recommendations and proposals for improvement that were subsequently agreed by the group of experts. The methodology of the consensus was like that used in the first phase through a modified Delphi method, except that the two rounds of voting were held in a single session (April 8, 2014) and scored from 0 to 10.

Statistical analysis consisted of a descriptive analysis expressed as mean and standard deviation or median and interquartile range for quantitative variables and as absolute values and percentages for qualitative variables. With regard to the Delphi methodology, two rounds were conducted to inform the group of experts about the detailed distribution of the group response of the first round. A high degree of consensus was considered as endorsement by at least 70% of the experts, medium when that proportion was 50-69% and low when it was less than 50%. For each item, the consensus of the group was considered a majority decision when the median was greater than or equal to 7. The processing and analysis of data was performed using the spreadsheet Microsoft Excel 2007.

Results

In the first phase, a final questionnaire of 15 questions (of the 30 initially discussed) was agreed, with four (26.6%) on the classification and location of the patient, 5 (33.3%) on the diagnosis, and 6 (40.0%) on treatment (Table 1). The remaining 15 questions were ruled out, since they were considered confusing and / or repetitive in 4 cases (13.3%) and in 11 cases (36.6%) for failure to reach 70% agreement among the experts after two rounds of evaluation.

In the second phase, 142 (77.2%) of the 184 surveys sent, from 21 of the 24 hospitals in Valencia were received. Tables 2, 3 and 4 show the results of the EPs responses to questions relating to the classification and location of the patient, diagnosis, and treatment.

In the third phase, of the 15 recommendations made, a high degree of consensus (median with score ≥ 7) was achieved for 11 of them (73.3%). Although a score between 5 and 6.9 was obtained in the remaining 4 (26.6%), it was decided to include all 15 recommendations in the final document (Table 5 and Figure 2).

Discussion

Clinical and care differences of elderly patients with respect to younger adults mean that a specific approach is required in the ED. In addition, evidence has shown that older patients receiving standardized care translates into more favorable clinical outcomes, especially when the patients meet frailty criteria¹¹. In this regard, this work shows 11 consensus recommendations of the 15 initially proposed for the management of el-

derly patients with suspected infection in the ED, and more specifically, on the classification and initial placement, diagnosis and treatment.

With regard to the initial classification and location of patients, 40% of clinicians thought that triage systems were not effective at detecting elderly patients at risk of serious infection, 60% thought that the code assigned to elderly patients with suspected sepsis had little or no correlation with severity, and 42% thought that more than 50% of the elderly at risk of serious infection were wrongly located. Previous studies have shown that the existing systems of triage may underestimate the severity level of elderly patients with possible consequences for the initial management and therefore the patient's prognosis^{1,12-14}. There is increasing number of EDs that have a "sepsis code" in order to improve the management of patients with systemic inflammatory response syndrome. However, the variables that determine activation cannot be adapted to the special characteristics of the elderly. Therefore, 9 out of 10 EPs believed it necessary to develop specific algorithms within the systems of triage for patients over 65 years, for the early detection of severe infection. Accordingly, an improvement proposal with a high degree of consensus to be incorporated in the Triage DEIMOS application, which is based on the Manchester Classification System and used in most hospitals of Valencia, was a warning alert that combines demographic criteria such as age (≥ 65 years) with easily identifiable clinical variables such as general parameters of the diagnostic criteria of sepsis, risk factors^{4,15,16} and the reasons for ED consultation to include atypical presentations of infection in the elderly^{1,17} in order to improve the sensitivity of triage for the early detection of these patients (Figure 2). In addition, other proposals based on protocol development, training and support tools to improve triage were also included.

Regarding diagnosis, it is known that the elderly population often do not show symptoms of infection at conventional radiology. In these patients with no clear source of infection, 53% of EPs considered ultrasound to be the most efficient diagnostic test. Previous studies have also recommended the early use of imaging techniques, particularly ultrasound for diagnostic purposes, allowing a diagnosis at the bedside in situations of hemodynamic instability^{16,18}. As such, and as reflected in the recommendations, sepsis management protocols should be developed, based on new technologies, as well as specific courses and workshops related to ultrasound and hemodynamic monitoring.

With regard to treatment, clinical practice guidelines recommend appropriate and early antibiotics, as both circumstances could influence prognosis¹⁸⁻²⁰. Sixty percent of the respondents felt that institutionalized elderly people had a higher risk profile, which would entail changes in the empirical antibiotic treatment and 90% of the respondents believed that testing for methicillin-resistant *Staphylococcus aureus* (MRSA) in patients with high risk was useful or necessary. This is consistent with previous studies that have shown that the elderly are at

Table 1. Results of the consensus of the expert group on the questionnaire (phase 1)

Definition of the question	Relevance of the question Round 1 (n = 21)	Relevance of the question Round 2 (n = 21)	Final result
1. Do you think that patients ≥ 65 have special risk of more serious infection than the general population just because of their age?	65%	62%	Removed
2. Which of these manifestations seem compatible with atypical infection in the elderly?	55%	54%	Removed
3. Patients ≥ 65 with suspected severe sepsis detected in the triage area should be coded with the highest priority?	60%	58%	Removed
4. How do you rate the ability of triage systems to detect elderly patients at risk of serious infection?	67%	74%	Accepted
5. Do you think the code assigned by the triage system to elderly patients with suspected sepsis correlates well with vital risk?	86%	88%	Accepted
6. Do you think it useful to develop a specific algorithm within the systems of triage for patients ≥ 65 with frailty criteria and taking into account the atypical presentations of this group for early detection of serious infections?	85%	85%	Accepted
7. What percentage of elderly patients at risk of serious infection are wrongly located after being classified?	74%	76%	Accepted
8. Patients with pneumonia may be considered at high risk for infection by multiresistant pathogens and therefore should they be treated with broad-spectrum antibiotics?	50%	52%	Removed
9. In the diagnosis in patients > 65 years with suspected infection, should they be subject to blood cultures when Temp is > 38° or < 36° with a minimum difference of 5-10 minutes?	65%	62%	Removed
10. Urgent radiology underestimates the involvement of the lung parenchyma while ultrasound may be useful to facilitate the choice of appropriate treatment?	58%	52%	Removed
11. What is your opinion about CVP monitoring in elderly patients with hemodynamic instability?	73%	74%	Accepted
12. What technique seems most useful in determining the hemodynamic status of elderly patients in the emergency department?	87%	87%	Accepted
13. Which of these biomarkers seems most useful for the early determination of the prognosis?	90%	92%	Accepted
14. Following conventional radiological study in patients without a clear focus of infection, what imaging test has the greatest diagnostic yield?	78%	80%	Accepted
15. What seems the most sensitive strategy for hemodynamic diagnosis of the elderly patient with basal vital constants within the range of normality?	58%	56%	Removed
16. Do you think that institutionalized elderly have a higher risk profile involving changes in empirical antibiotic treatment?	88%	90%	Accepted
17. To what extent is it advisable to apply a MRSA screening protocol in the emergency department for patients at high risk?	75%	76%	Accepted
18. What type of fluid would you use as first choice for the resuscitation of an elderly patient in septic shock?	68%	72%	Accepted
19. Is it necessary to systematically identify risk factors for resistant microorganisms in elderly patients with suspected infection?	78%	78%	Accepted
20. In patients over 65 years at risk for pseudomonas, a combination of antibiotics is recommended. In most patients, is empirical monotherapy sufficient using patient profiles?	64%	58%	Removed
21. What volume infusion strategy seems safer and more effective in elderly ED patients with sepsis?	95%	95%	Accepted
22. Which of the following statements regarding the detection of risk factors for BLEE infections in the elderly do you most agree with?	64%	62%	Removed
23. Is it necessary to cover pseudomonas or MRSA in the empirical treatment of the elderly with suspected infection?	66%	66%	Removed
24. Would you recommend only a combination of antibiotics for elderly patients at risk of pseudomonas or with neutropenia?	64%	62%	Removed
25. Which of the following measures seems most useful for the safe management and monitoring of the effect of vasoactive drugs in the emergency department?	78%	78%	Accepted
26. What would be your best treatment option for an elderly patient with limitation of treatment and pneumonia with severe hypoxemia?	88%	90%	Accepted
27. The use of corticosteroids, immunoglobulins and recently statins can be a therapeutic strategy in selected patients?	22%	20%	Removed
28. These patients should be admitted early (within 2 hours) to the ICU for hemodynamic monitoring and ventilatory support measures despite the initial response to the volume as they are at high risk of mortality?	49%	46%	Removed
29. The use of carbapenem associated with vancomycin or linezolid is the treatment of choice for patients > 65 years with severe sepsis or septic shock. Is tigecycline an option in patients allergic to penicillin?	64%	60%	Removed
30. High-flow oxygen therapy is the technique of choice in elderly patients with hypoxemia defined by a PaO ₂ / FiO ₂ <300 and respiratory work, as they have a better and faster response, improving patient prognosis?	39%	38%	Removed

Temp: temperature; PVC: central venous pressure; MRSA: methicillin-resistant *Staphylococcus aureus*; ESBL: Extended spectrum beta-lactamase; ICU: intensive care unit.

Table 2. Results of the online survey concerning the classification and placement of elderly patients with suspected infection in the emergency department (phase 2)

	n = 142
How do you rate the ability of triage systems to detect elderly patients at risk of serious infection?	
Very effective	7%
Moderately effective	53%
Not very effective	37%
No good for this purpose	3%
Do you think the code assigned by the triage system to elderly patients with suspected sepsis correlates well with vital risk?	
Very good	2%
Good	38%
Poor	57%
Not at all	3%
Do you think it useful to develop a specific algorithm within the systems of triage for patients ≥ 65 with frailty criteria and taking into account the atypical presentations of this group for early detection of serious infections?	
Very useful	48%
Quite useful	43%
Unhelpful	7%
Not useful	2%
What percentage of elderly patients at risk of serious infection are wrongly located after being classified?	
> 80% of cases	4%
50-80%	38%
< 50%	45%
The current triage system correctly locates most patients	13%

high risk of infection with extended beta-lactamase (ESBL) producing gram-negative bacilli^{23,24}, especially in institutionalized patients, and the progressive increase in the incidence of MRSA in hospitals and residences²⁵. In this regard, the proposed improvements included the development of guidelines for the management of specific empirical antibiotic treatment in the ED, knowledge of the bacteriological map and resistances of each hospital and, finally, establishing patient profiles, particularly in the institutionalized, for the detection and treatment of multiresistant microorganisms. All the above measures would improve the choice of antibiotics in the ED, which is crucial to reduce the number of resistances^{21,22}.

Regarding ultrasound-guided fluid replacement, the elderly may have a diminished cardio-circulatory reserve making them vulnerable to iatrogenic harm caused by excessive or too rapid volume infusion and thus acute pulmonary edema²⁶. However, too conservative fluid management may result in improper preload state with consequent hypovolemia. Most (59%) of the EPS considered the combined use of ultrasound and non-invasive cardiac output monitors as the safest and most effective ED strategy to guide volume infusion in elderly patients^{27,28}.

Different studies question CVP monitoring as it does not significantly detect patients who are potential responders to volume. There is increasing use of cardiac output monitors that detect the pulse wave and are mi-

Table 3. Results of the online survey concerning the diagnosis of elderly patients with suspected infection in accident and emergency services (phase 2)

	n = 142
Which of these biomarkers seems most useful in determining early prognosis?	
Lactic acid	43%
SvCO ₂	2%
Procalcitonin	55%
Adrenomedullin	0%
What is your opinion about CVP monitoring in elderly patients with hemodynamic instability?	
This is the reference standard for fluid management	24%
Its reliability is limited by chronic cardiopulmonary disease	14%
There is no good correlation of CVP values with changes in blood volume	14%
Its use is limited by the invasive nature of the technique	48%
What technique seems most useful in determining the hemodynamic status of elderly patients in the emergency department?	
Mean invasive blood pressure	11%
Central venous pressure	28%
Cardiac index using a non-invasive method	43%
Ultrasound at the bedside	18%
Following conventional radiological study in patients without a clear focus of infection, what imaging test has the greatest diagnostic yield?	
Repeat plain radiography at 2-4 hours	12%
Ultrasonography	53%
Computed tomography	31%
Magnetic resonance	4%
Is it necessary to systematically identify risk factors for resistant microorganisms in elderly patients with suspected infection?	
0	0%
1	0%
2	2%
3	1%
4	2%
5	9%
6	3%
7	15%
8	27%
9	10%
10	31%

nimally invasive or non-invasive, to guide fluid infusion, determine hemodynamic status and supervise the administration of vasoactive drugs²⁹. This could be especially useful in the elderly because of their complexity, comorbidity and unpredictable response to volume and use of vasoactive drugs. However, to date, they have not been included completely in the guidelines because of the lack of studies with sufficient sample size¹⁸. This work shows that there was a high degree of agreement on the development of protocols for the use of fluids and vasoactive drugs and the management of sepsis, based on the new technologies.

As for non-invasive mechanical ventilation (NIV) and high flow oxygen therapy, the respondents considered these to be the best treatment options for elderly patients with pneumonia and severe hypoxemia with treatment limitation. Both techniques have proven useful in the management of acute respiratory failure associated with pneumonia in immunosuppressed patients and in situations presenting limiting therapeutic efforts such

Table 4. Results of the online survey concerning the treatment of elderly patients with suspected infection in the emergency department (phase 2)

	n = 42
Do you think that institutionalized elderly have a higher risk profile involving changes in empirical antibiotic treatment?	
Yes	60%
You have to individualize each case	38%
Only those who are immunocompromised	2%
Not significantly	0%
To what extent is it advisable to apply a MRSA screening protocol in the emergency department for patients at high risk?	
In emergencies should not be done	4%
It is a useful but difficult step in the emergency room for care burden	52%
It is essential, as is the way of the emergency input of these patients usual	38%
Identifying these patients from the emergency room would be enough	6%
What kind of fluid would you use as first choice in resuscitation of an elderly patient in septic shock?	
Crystalloid	63%
Colloids	5%
Indistinctly	3%
Combined crystalloid / colloid	29%
What strategy seems safer and more effective in the emergency department for volume infusion in elderly patients with sepsis?	
Vital constants: blood pressure, heart rate, respiratory rate and diuresis	18%
Non-invasive monitoring of cardiac output	22%
Ultrasound of the inferior vena cava	1%
Combined use of ultrasound and non-invasive cardiac output monitoring	59%
What measure Which of the following measures do you find most useful for the safe management and monitoring of the effect of vasoactive drugs in the ED?	
Having a central line	10%
Monitoring of blood pressure and urine output	8%
Invasive monitoring of cardiac output	2%
Non-invasive monitoring of cardiac output	78%
What would be your best treatment option for an elderly patient with limitation of treatment and pneumonia with severe hypoxemia?	
Intubation and connection to mechanical ventilation	1%
Conventional oxygen therapy	4%
Humidified nasal high flow oxygen	30%
Non-invasive ventilation	65%

MRSA: methicillin-resistant *Staphylococcus aureus*.

as advanced cardiac diseases and patients in palliative care³⁰⁻³². Therefore, another improvement proposal was to conduct courses in NIV and oxygen therapy in the elderly, since these patients are often candidates for this

type of minimally invasive technologies, with high therapeutic efficiency and provide a high rate of satisfaction not only for patients but also for their families.

This study has a number of limitations due to the

Table 5. Results of the expert group consensus on recommendations and proposals for improvement (phase 3)

Recommendations and improvement proposals	Assessment round 1 (0-10 points)	Assessment round 2 (0-10 points)	Score > 7 (n = 21) %	Order importance	Result final high degree (> 7)
Area of Classification and location of the patient					
Incorporation of "sepsis alert" in DEIMOS	7.6	7.8	71.4%	5 ^o	YES
Specific training courses for nurses	7.9	8.0	76.1%	3 ^o	YES
Developing protocols and actuation circuits	7.5	7.5	76.1%	7 ^o	YES
Posters and explanatory cards to support triage	7.4	7.4	71.4%	8 ^o	YES
Interdisciplinary sessions	6.6	6.6	61.9%	12 ^o	NO
Location of elderly patients at risk of serious infection in monitored areas within 10 minutes	6.4	6.6	57.1%	13 ^o	NO
Diagnostic area					
Developing protocols for the management of sepsis based on new technologies (hemodynamic monitoring and ultrasound)	7.2	7.4	71.4%	9 ^o	YES
Specific courses and workshops on new technologies	7.4	7.6	71.4%	6 ^o	YES
Early diagnosis protocol of MRSA colonization for susceptible elderly patients	6.2	6.2	52.3%	14 ^o	NO
Rotation guided by specific units	5.8	6.0	42.8%	15 ^o	NO
Treatment area					
Management guidelines for specific empirical antibiotics in the ED	8.2	8.3	85.7%	1 ^o	YES
Knowing bacteriological map and resistance of each hospital	7.8	7.9	76.1%	4 ^o	YES
Patient profiles for the treatment of resistant organisms	7.1	7.1	66.6%	11 ^o	YES
Courses in NIV and oxygen therapy for the elderly	7.3	7.3	71.4%	10 ^o	YES
Protocols for the use of fluid therapy and vasoactive drugs	8.2	8.2	80.9%	2 ^o	YES

*NIV: noninvasive ventilation; MRSA: methicillin-resistant *Staphylococcus aureus*.

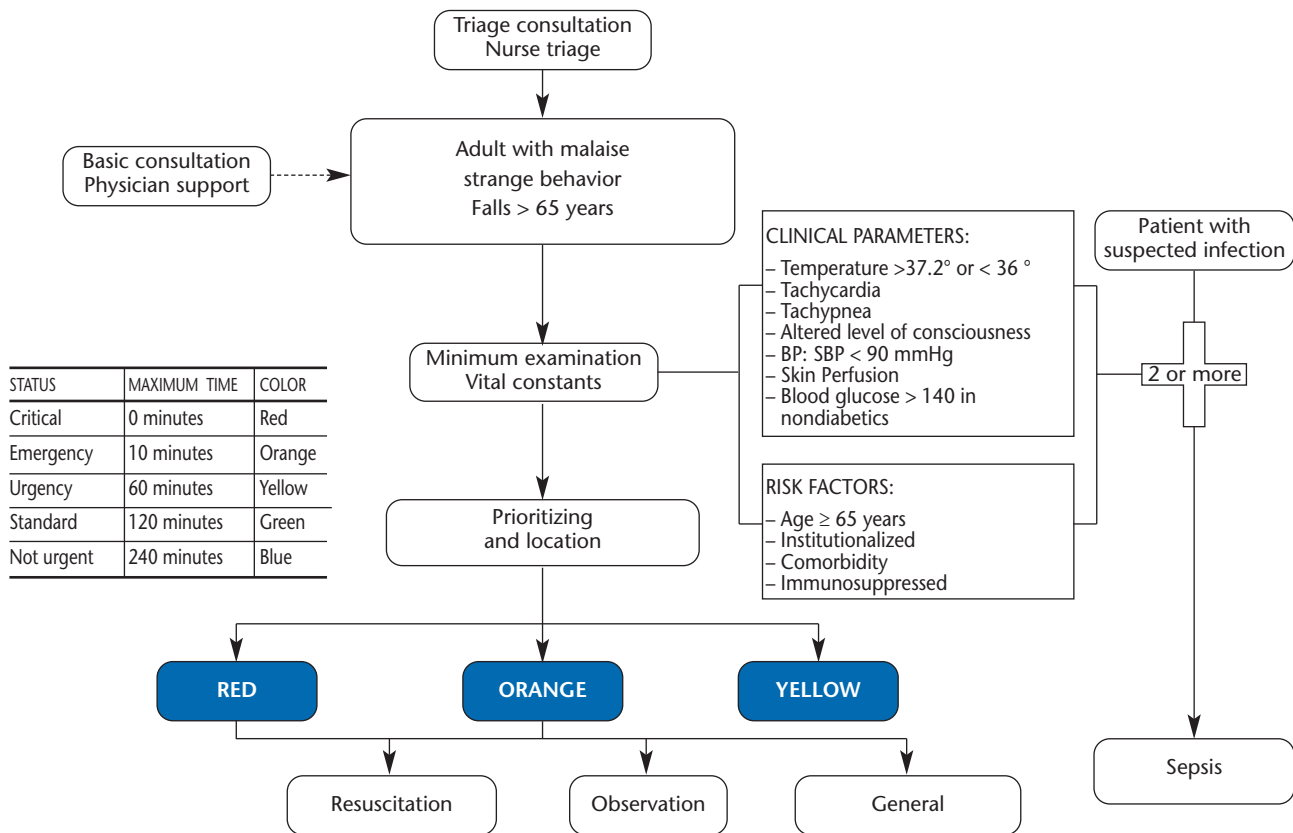


Figure 2. Proposed classification and placement of elderly patients with suspected infection in hospital emergency departments in the Valencia region. BP: blood pressure; SBP: systolic blood pressure.

particular design of the study, aimed at establishing a set of recommendations and proposals for improvement. With respect to the consensus method, we used a modified Delphi methodology with some variations, since the discussion of the results by the expert group took place at face-to-face meetings and therefore anonymity was not maintained, which could have conditioned to some extent the expression of opinion. With regard to the electronic survey, there were no structured requirements for the selection of EP respondents, since the purpose was to obtain an approximate assessment of the issues raised by the group of experts in order to be able to formulate recommendations and proposals for improvement. Despite these limitations, 11 recommendations and suggestions for improvements were made with a high degree of consensus by the experts with regard to the management of elderly patients with suspected infection in Valencian hospital EDs. Future studies will determine the degree of their implementation and the impact of these recommendations and proposals for improvement in daily clinical practice of these EDs.

Conflict of interest

The authors declares no conflict of interest in relation to the present article.

Participants in the PIPA project

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