Madrid, April 8th 2019

# *Antibiotic Administration Time Decrease in Urgent Care of Medical Oncology Service patients being treated with potentially neutropenia inducing Regimens*

ASCO® Quality Training Program

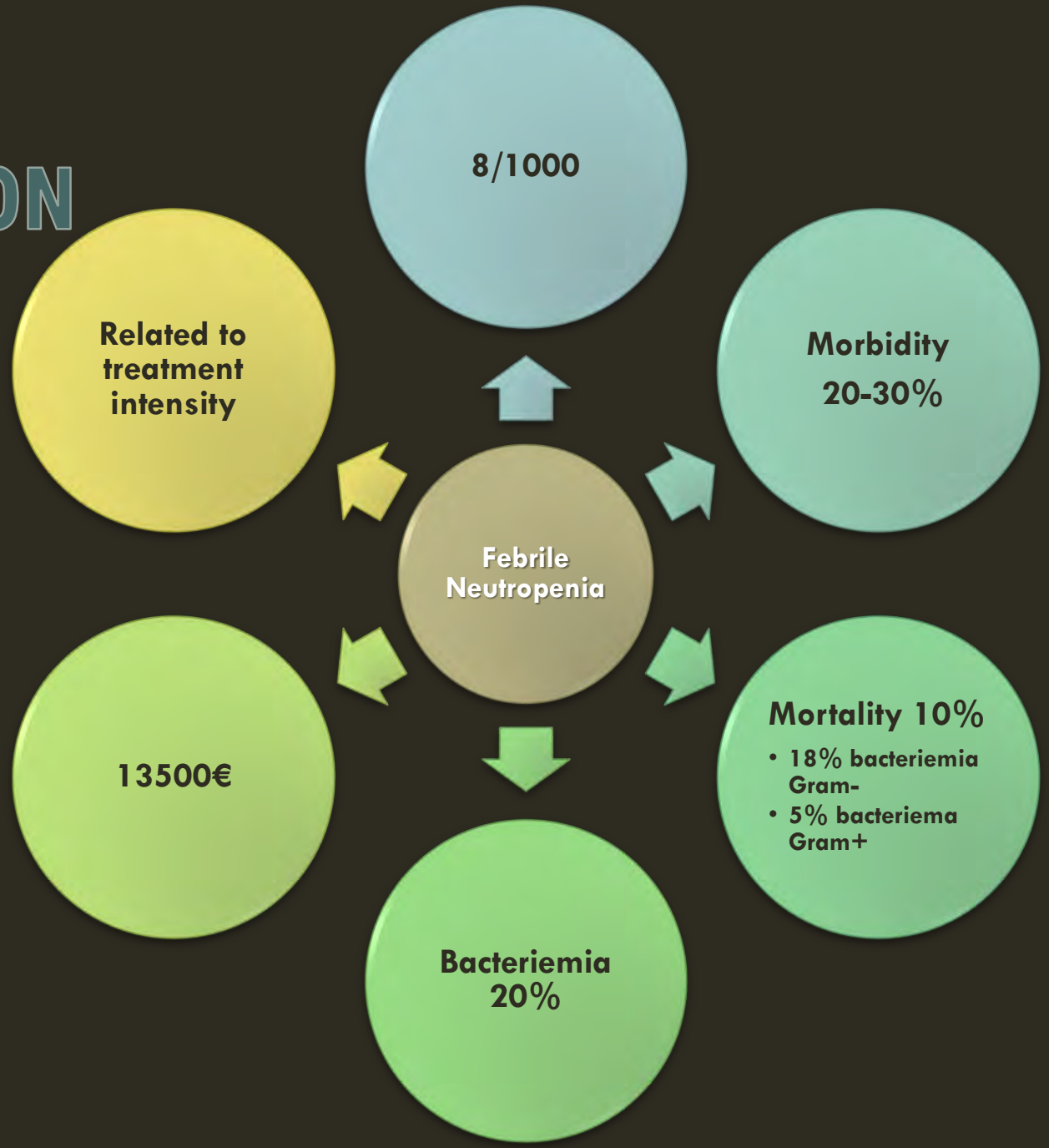
eco Fundación para la Excelencia y la Calidad de la Oncología


*María del Pilar Solís Hernández*

*Department of Medical Oncology*

SERVICIO DE SALUD DEL PRINCIPADO DE ASTURIAS | Hospital Universitario Central de Asturias

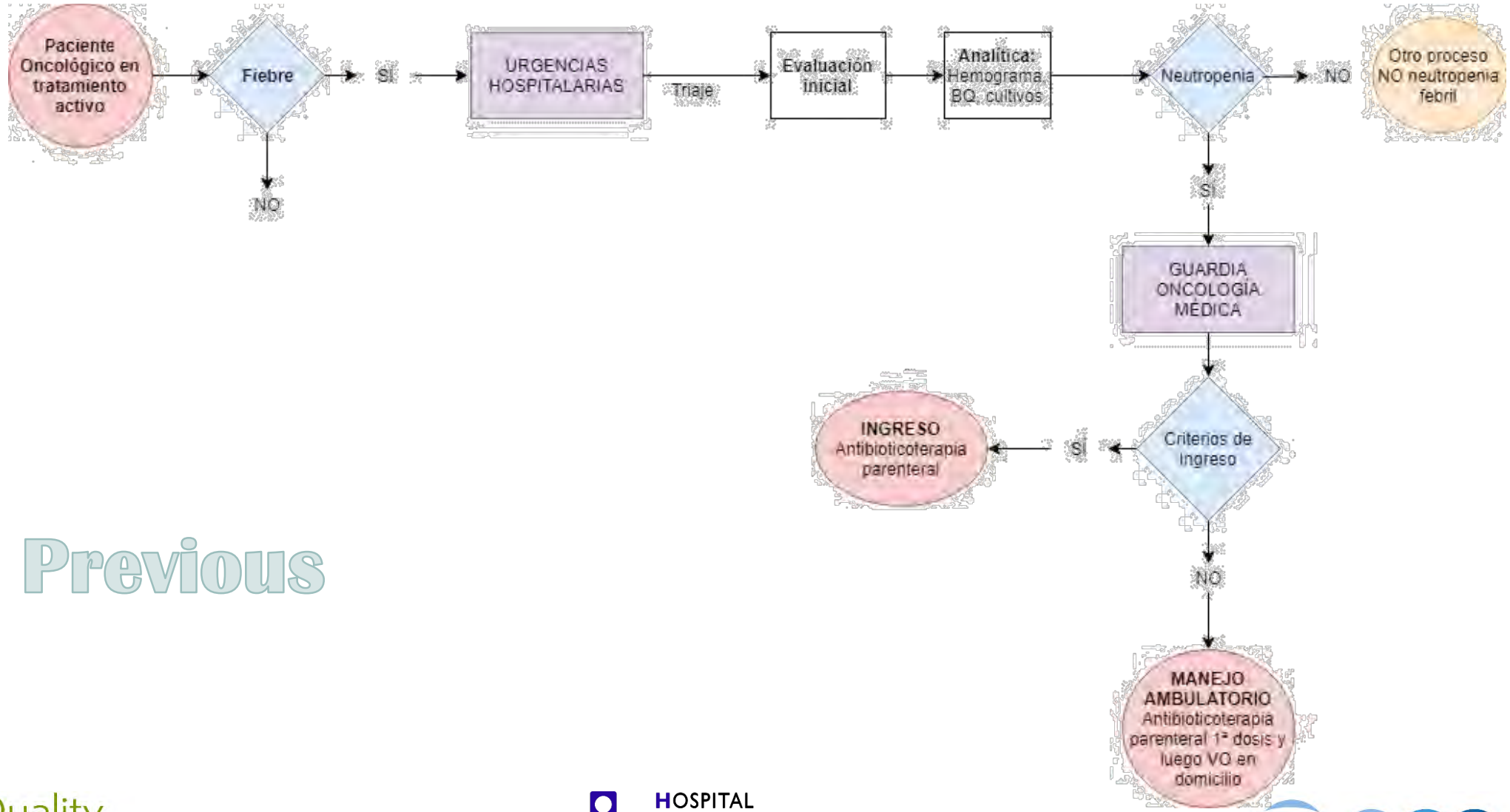
# INTRODUCTION



# Problem Statement

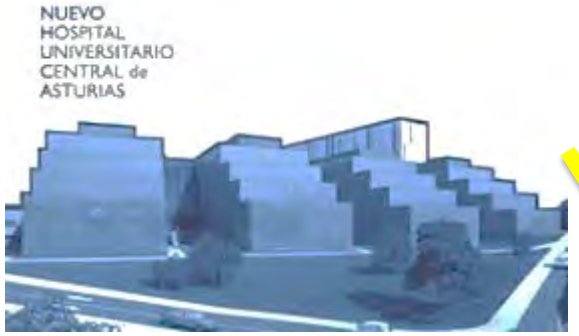
- Oncological patients under cytotoxic treatment that present fever have an average time of antibiotics administration of 11h (median 4h07') when admitted and identified at the Emergency Room Service @ HUCA due to diverse causes
  - International guidelines recommend antibiotic administration in the 1st hour: "The golden hour".

# Process Map




Previous

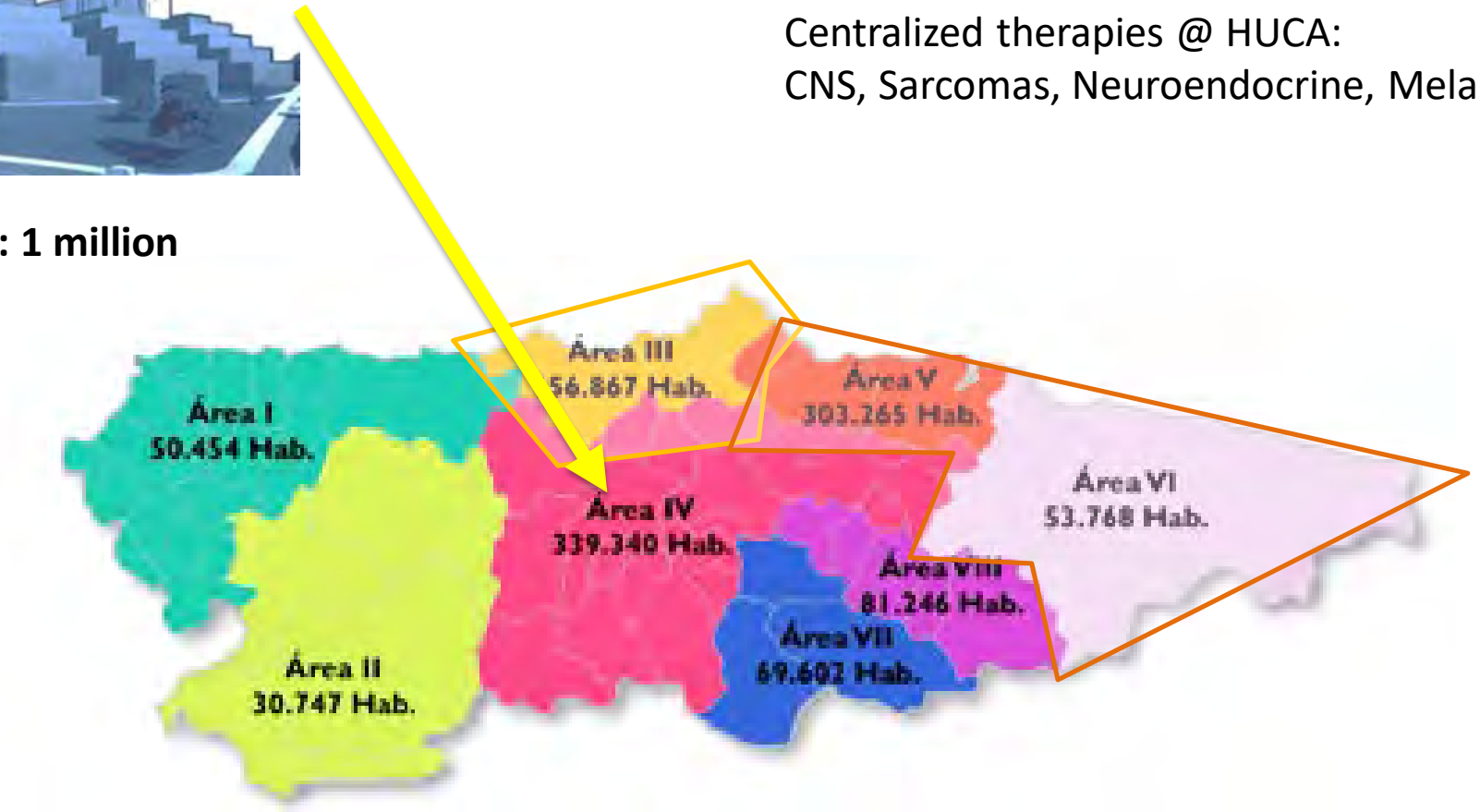
# Institutional Overview




**Population: 1 million**

**Area III** – Only Breast and colorectal
**Area IV** + Includes area VI

Centralized therapies @ HUCA:
CNS, Sarcomas, Neuroendocrine, Melanoma



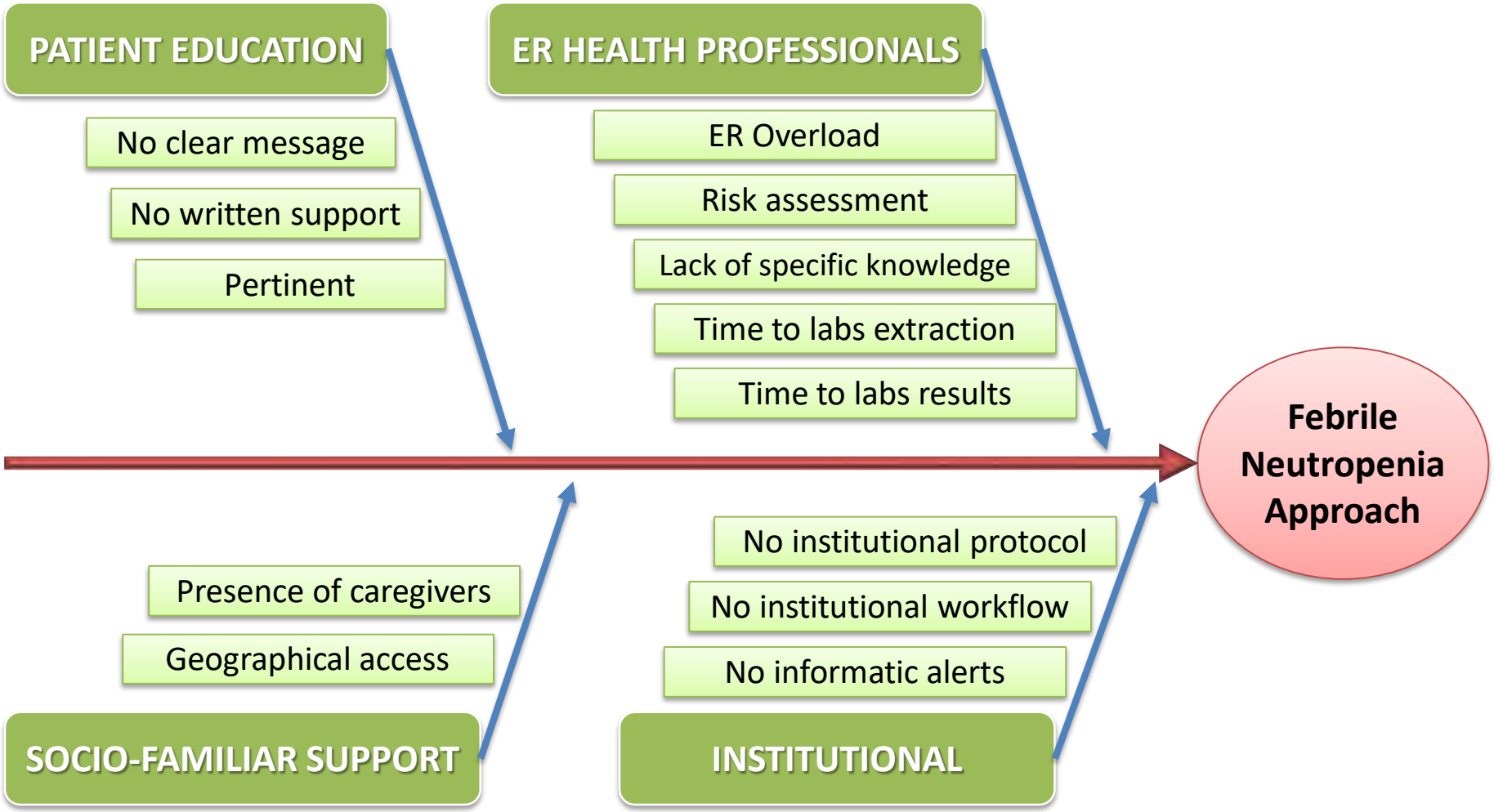
# Institutional Overview

| 2018 Statistics | |
|---|---|
| New visits | 1950 |
| Daily patients (mean) | 150 |
| Daily Day Hospital treatments (mean) | 90 |
| Inpatients (31 beds) | Average stay 11 days |
| Total number of Febrile Neutropenia inpatients | 148 in 2018<br>Average stay >11 days |

# Team Members

| Position | Who? |
|---|---|
| Project Sponsor | SESPA – HUCA (institution) |
| Project Responsible | Dr. Emilio Esteban González - Medical Oncology Chief |
| Team Leader | Dr. Mª Pilar Solis Hernandez – Medical Oncologist |
| Team Members | Eva Pérez Pertierra – Nurse Supervisor DCH<br>Ana García Álvarez – Outpatient Clinic Nurse |
| Other members | Medical oncology staff<br>Medical fellows<br>Administrative assistants |
| Other Services | Emergency Room<br>ER Chief: Dr. Antuña<br>ER staff: Leaders Dr. Herrero & Dr. Rubianes<br>ER Nurses<br>ER Trainees |
| Patient/Caregivers | a specific survey will be conducted |

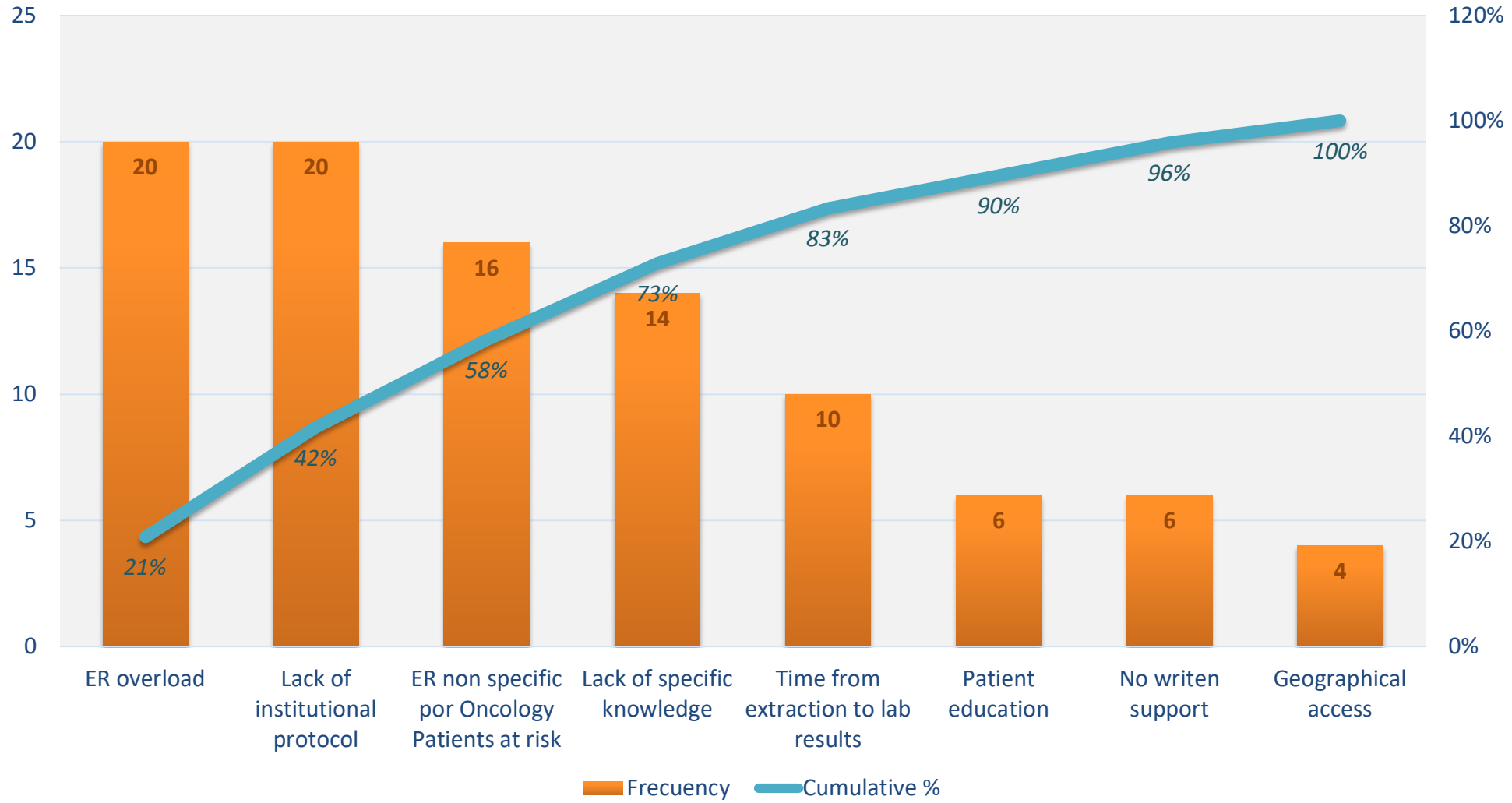
# Cause & Effect Diagram



# Aim Statement

- Antibiotic administration start during the first hour from admission in 90% of Medical Oncology patients receiving chemotherapy regimens with high risk for Febrile Neutropenia, when presenting fever or under FN suspicion @ ER.
  - Reduction in the time to first antibiotic administration to:
    - 90% <1 hour from admission

# Diagnostic Data

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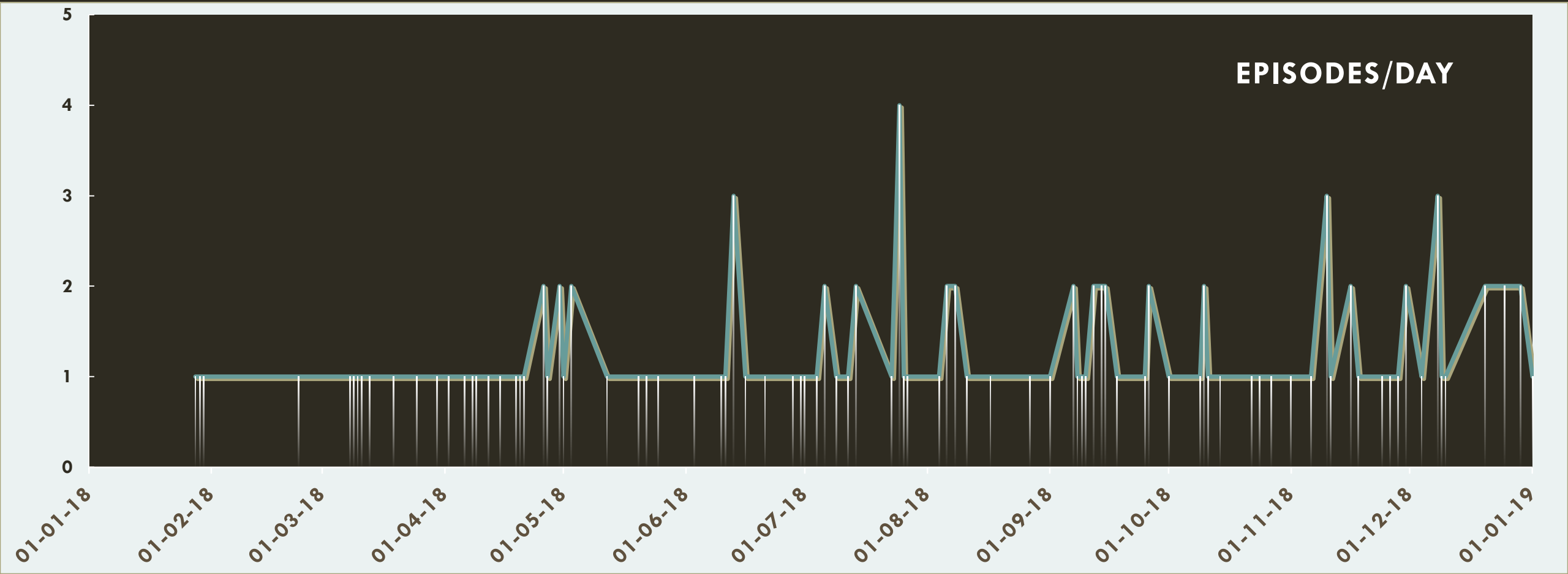
# Measures

- Measure:
  - *Time from the patient's admission to administration of antibiotic treatment.*
  - *Number of visits to ER with fever*
  - *Number of inpatients with Febrile Neutropenia diagnosis*
  - *Average stay of inpatients with Febrile Neutropenia diagnosis*
- Patient population:
  - *Patients with solid tumors under cytotoxic treatment*
  - *No exclusion as it is considered an EMERGENCY*
- Calculation methodology:
- Data source:
  - *Informatics (list)*
  - *Clinical records (time of admission and time of antibiotic administration)*
- Data collection frequency:
  - *Trimestral*
- Data quality(any limitations):
  - *Record of the diagnostic in a section not stipulated by the electronic clinical record or discharge inform.*

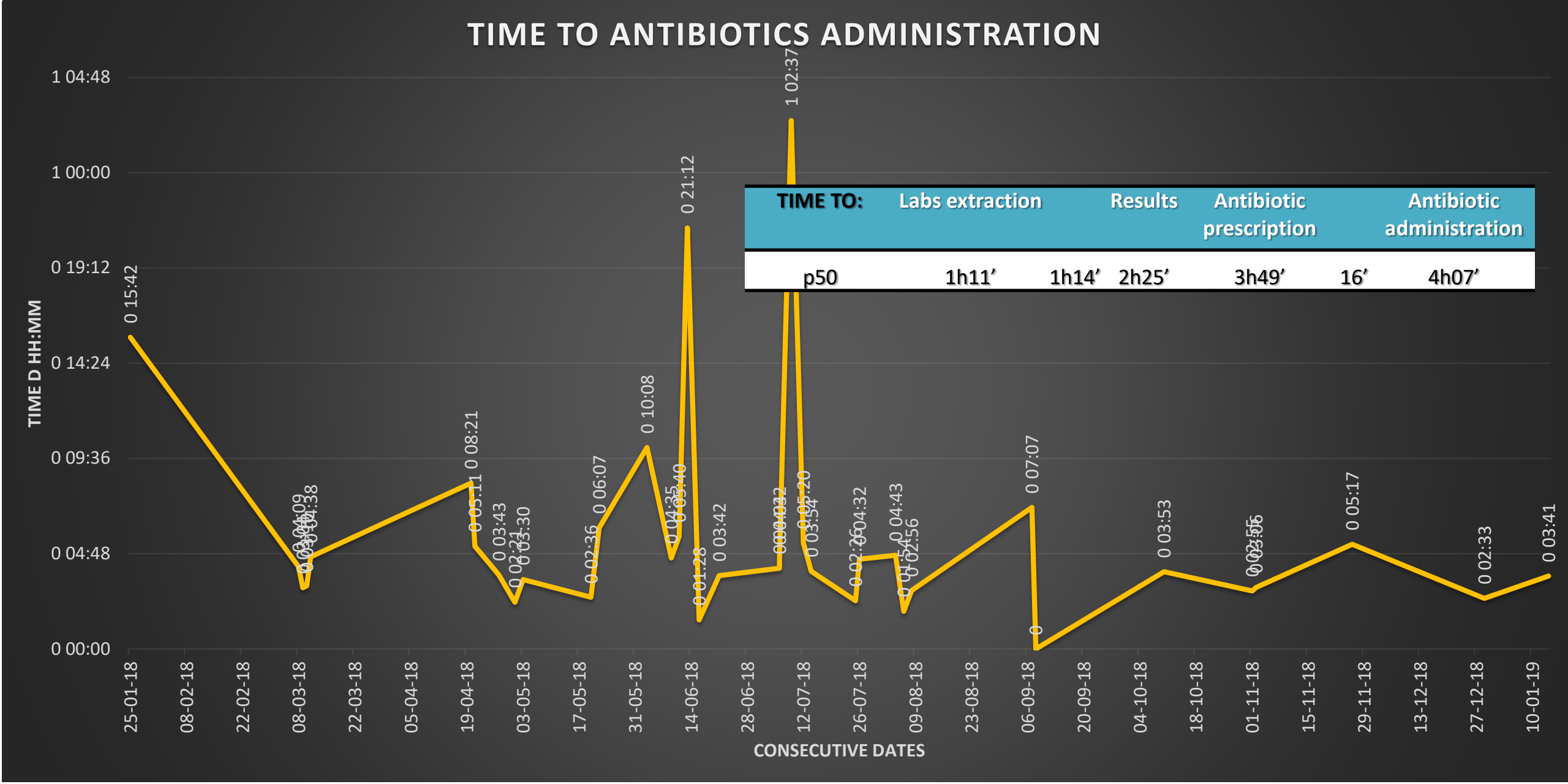
# Baseline Data

# NÚMEROS

| | 2018<br>First visits: 2250 |
|---|---|
| Reason for attendance: FEVER | 118 |
| Diagnostic: Neutropenia (not necessarily presenting fever) | 38 |
| | 156 |



# TIME TO ANTIBIOTICS ADMINISTRATION




| TIME TO: | Labs extraction | Results | Antibiotic prescription | Antibiotic administration |
|---|---|---|---|---|
| p50 | 1h11’ | 1h14’ | 2h25’ | 3h49’ | 16’ | 4h07’ |

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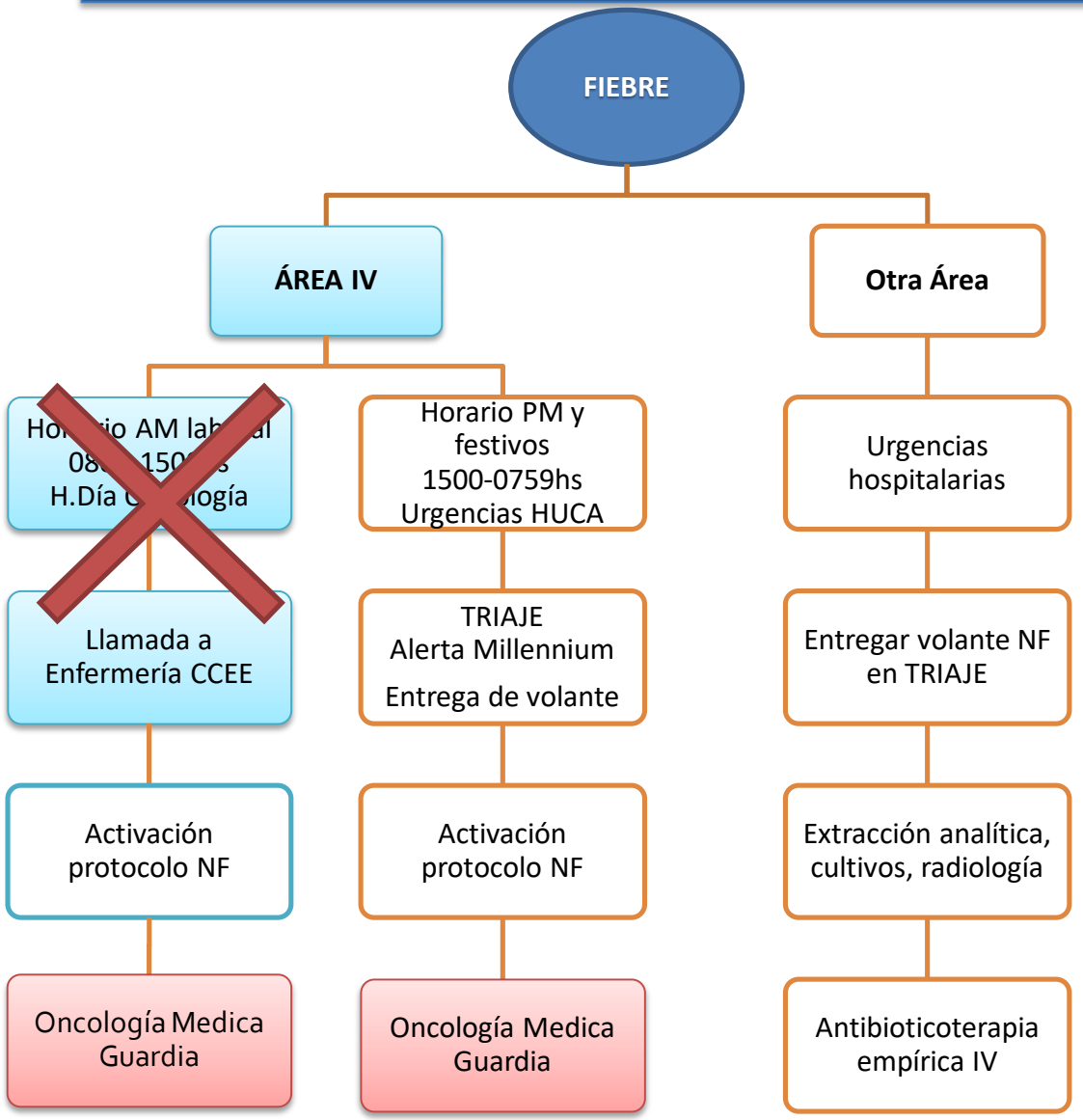
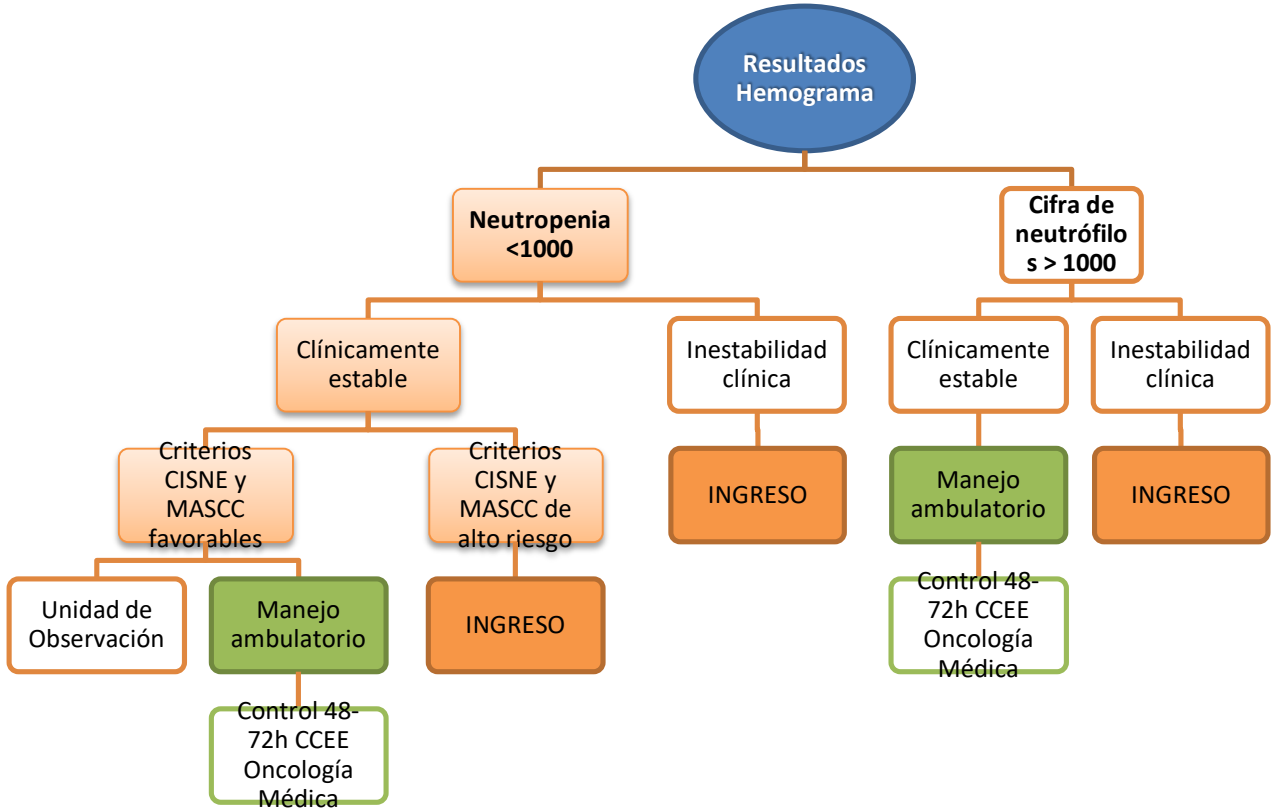
# Initial approach proposed

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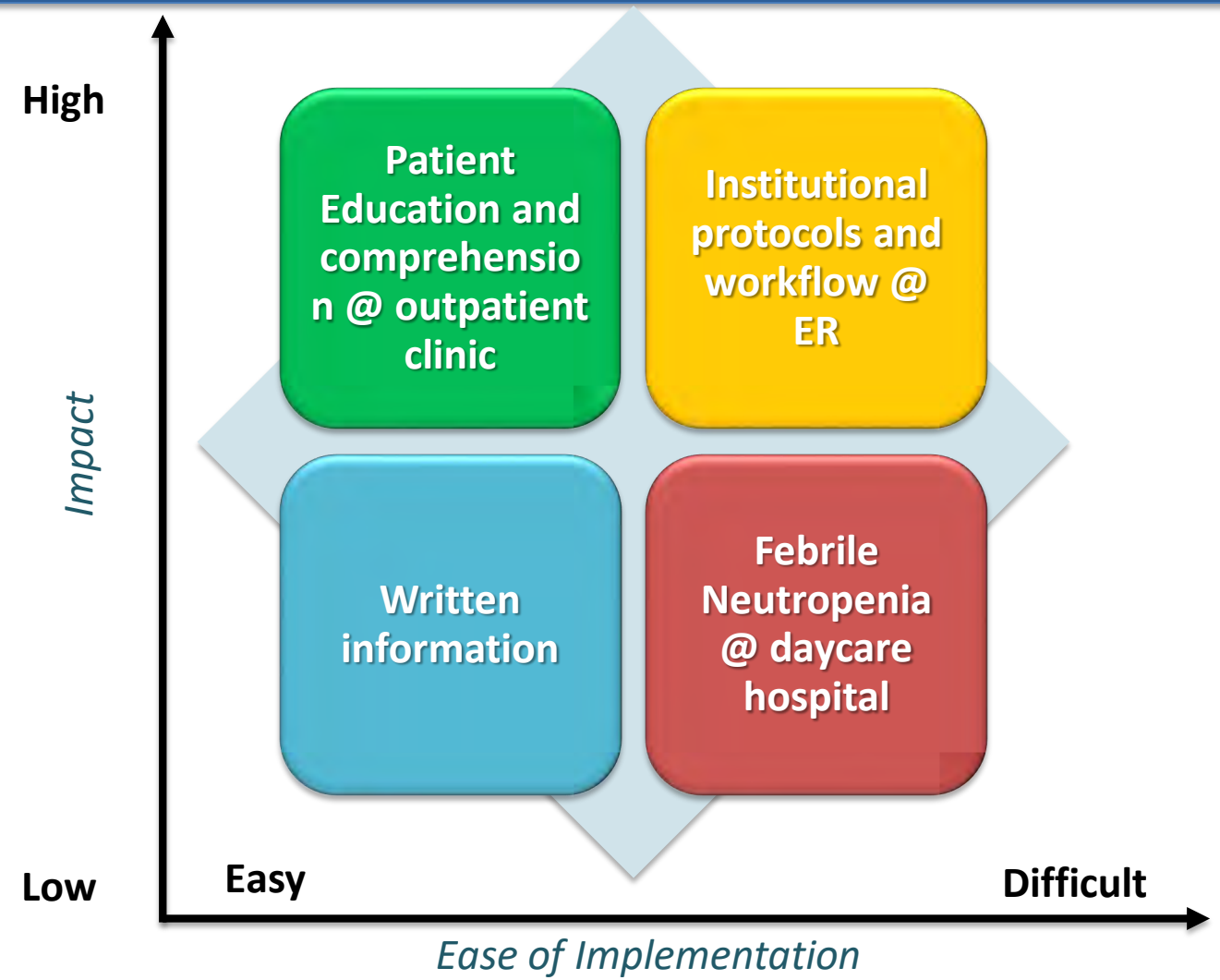
# Prioritized List of Changes (Priority/Pay –Off Matrix)



# PDSA Plan (Test of Change)

| | Cambios que deben ponerse a prueba e implementarse para alcanzar el objetivo | Medidas para supervisar los avances | |
|---|---|---|---|
| 1 | Proposed protocol of care in HDO for patients with fever and high risk of neutropenia | Review of Processes activated from the beginning of the implementation | |
| 2 | Creation of the flow of patients at risk of febrile neutropenia agreed with Medical Oncology and Emergency. | Randomized review of 5 clinical histories with schemes with high risk of NF. Monthly | Number of emergency visits of patients at risk of febrile neutropenia |
| 3 | Creation of the process "PRO ONM Febrile Neutropenia" in the CERNER-Millennium® computer tool through its FirstNET and PowerChart applications. | | Total number of activations of the process in the Sº de Urgencias (URG). |
| 4 | Timely labeling of the population at risk by creating the LABEL transepisode indicating that it is a patient with high risk of immunosuppression and development of febrile neutropenia. | | Verify that the risk has been labeled with the corresponding mark, otherwise label it. |
| 5 | Preparation of educational material for the patient that will be added to the database of the previously indicated applications | | Verify that it has been recorded in the story. |

| Cambio Nº | Fechas de inicio y fin del ciclo PDSA | Plan para poner a prueba cada cambio/intervención<br>Describa lo que deberá hacer:<br>a. Prepararse para poner a prueba este cambio<br>b. Determinar cómo llevará a cabo la prueba, incluir predicción | Persona Encargada | ¿Quién debe involucrarse? | Resumen de los Resultados |
|---|---|---|---|---|---|
| 1 | 18-01-19 | Argument with current figures of expected daily workload. | Pilar Solís[ONM]<br>Eva Pérez [HDO] | Nurses HDO + Supervisor<br>Jefe de Servicio | The possibility of attention was explored with HDO nursing and the proposal was rejected, with the reason of scarce human resources |
| 2 | 01-02-19 a 22-02-19 | Interaction with the emergency service in order to refine the process so that it is more agile for both services. | Pilar Solís[ONM] | Jefes Sº de URG y ONM<br>Informática [Cerner] | The patient at risk was defined.<br>The patient flow was built. |
| 3 | 15-02-19 a 20-02-19 | Periodic meetings with Cerner-Millennium® emergency and maintenance services. Exploration in initial "test environment", then for a specific user profile and finally | Pilar Solís[ONM] | Franz Jimeno[Cerner]<br>P.Herrero [URG]<br>P.Rubianes [URG] | The indication of the process that includes care, analytics, microbiology and antibiotic therapy was created. |
| 4 | 15-02-19 | In the weekly sessions of the service the relevance and importance of the process is instructed and remembered. Physicians will be supported for the proper identification of patients. | Pilar Solís[ONM] | Oncólogos Médicos | Activated and initiated the labeling of patients at risk of NF |
| 5 | 15-02-19 | Provide a paper version of the Febrile Neutropenia Process, to be delivered to the Emergency Department in case of Fever in the 6 weeks after the last dose. | Pilar Solís[ONM] | Oncología Médica<br>Facultativos y Enfermería | It was sent to reprography, and was added to the Patient Education component. Patients have a priority attention in the emergency department. |

# MATERIALS DEVELOPED

# NEUTROPENIA FEBRIL

## Optimización del circuito actual

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Mutual cooperation between the ER and Medical Oncology Services

# PROJECT JUSTIFICATION

**Urgent Care of Oncological Patient**

ER overload

Requires patient education

**Urgent Care of Oncological Patient**

**FEVER**

Not all patients receive schemes with neutropenia potential

Increases el NNT

**Urgent care at high risk of febrile neutropenia:**

**EMERGENCY**

Fewer cases

Pertinent target population

# International recommendations

*Antibiotics in the first hour*

*Minimum 4h clinical observation before discharge*

DOI: https://doi.org/10.1200/JCO.2017.77.6211

## Outpatient Management of Fever and Neutropenia in Adults Treated for Malignancy: American Society of Clinical Oncology and Infectious Diseases Society of America Clinical Practice Guideline Update

*Randy A. Taplitz, Erin B. Kennedy, Eric J. Bow, Jennie Crews, Charise Gleason, Douglas K. Hawley, Amelia A. Langston, Loretta J. Nastoupil, Michelle Rajotte, Kenneth Rolston, Lynne Strasfeld, and Christopher R. Flowers*

A B S T R A C T

**Purpose**
To provide an updated joint ASCO/Infectious Diseases Society of American (IDSA) guideline on outpatient management of fever and neutropenia in patients with cancer.

**Methods**
ASCO and IDSA convened an Update Expert Panel and conducted a systematic review of relevant studies. The guideline recommendations were based on the review of evidence by the Expert Panel.

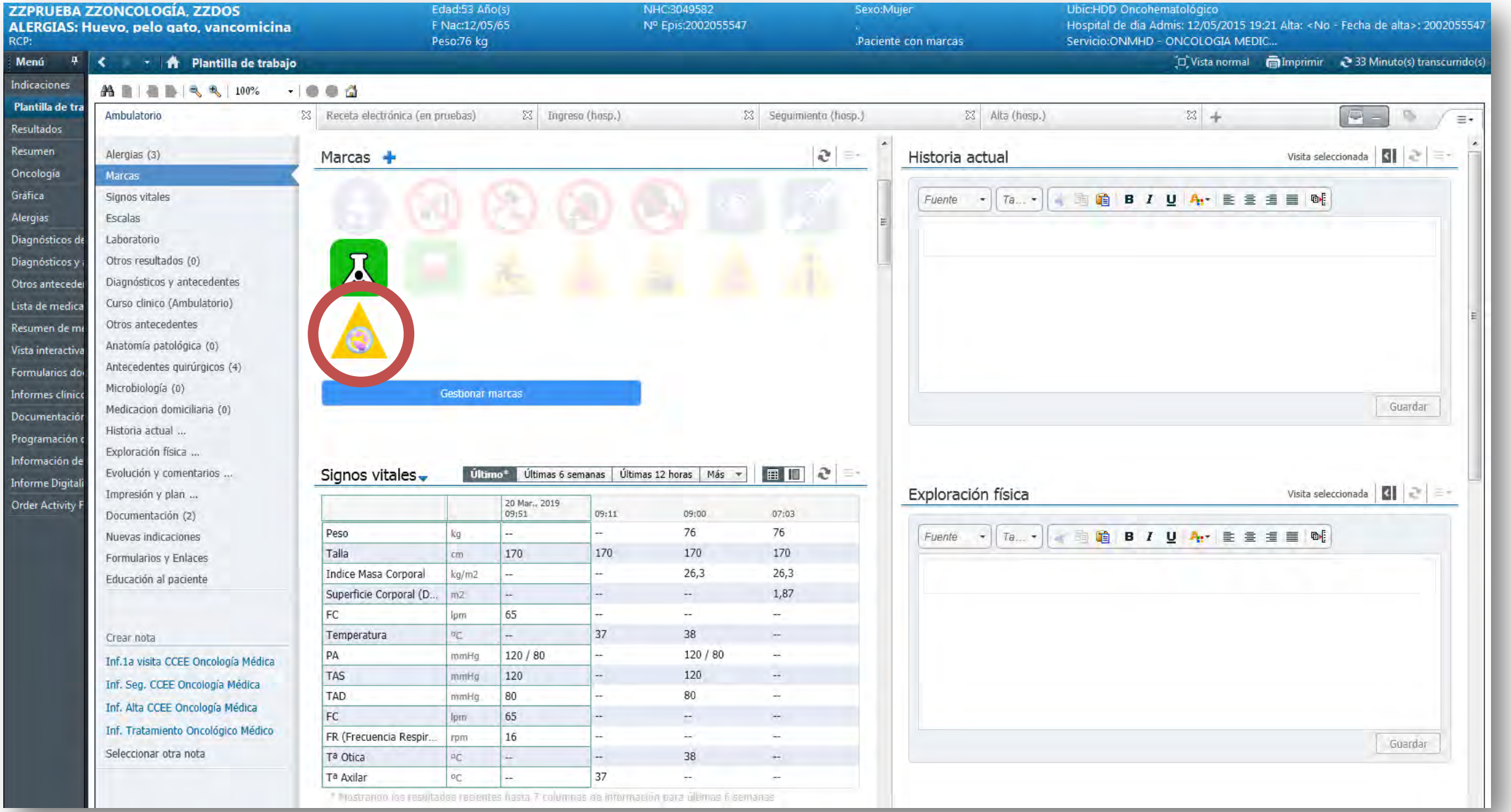
**Results**
Six new or updated meta-analyses and six new primary studies were added to the updated systematic review.

**Recommendation**
Clinical judgment is recommended when determining which patients are candidates for outpatient management, using clinical criteria or a validated tool such as the Multinational Association of Support Care in Cancer risk index. In addition, psychosocial and logistic considerations are outlined within the guideline. The panel continued to endorse consensus recommendations from the previous version of this guideline that patients with febrile neutropenia receive initial doses of empirical antibacterial therapy within 1 hour of triage and be monitored for ≥ 4 hours before discharge. An oral fluoroquinolone plus amoxicillin/clavulanate (or clindamycin, if penicillin allergic) is recommended as empirical outpatient therapy, unless fluoroquinolone prophylaxis was used before fever developed. Patients who do not defervesce after 2 to 3 days of an initial, empirical, broad-spectrum antibiotic regimen should be re-evaluated and considered as candidates for inpatient treatment.

# LABEL

Medical oncologist will activate this label when 1st indicated high FN risk chemotherapy and it will be disabled by the system after 6 weeks from the last dose.

**Alarm if Fever and Label**

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# WRITTEN EDUCATION

Se entregará a los pacientes con alto riesgo de neutropenia por esquema y/o factores adicionales.

*Sº de Urgencias & Sº de Oncología Médica*

## Protocolo Neutropenia Febril

Si se le ha entregado este volante, es porque usted está recibiendo un tratamiento que le pone en riesgo de bajada de las defensas que puede dejarle más vulnerable a las infecciones.

**Si ha recibido quimioterapia en las últimas 6 semanas**

**Si tiene fiebre mayor o igual a 38ºC**

- Tome un antitérmico (p. ej. paracetamol)
- Diríjase al servicio de Urgencias más cercano
  - Comprobarán sus antecedentes
  - Activarán el protocolo de Paciente en riesgo de Neutropenia Febril

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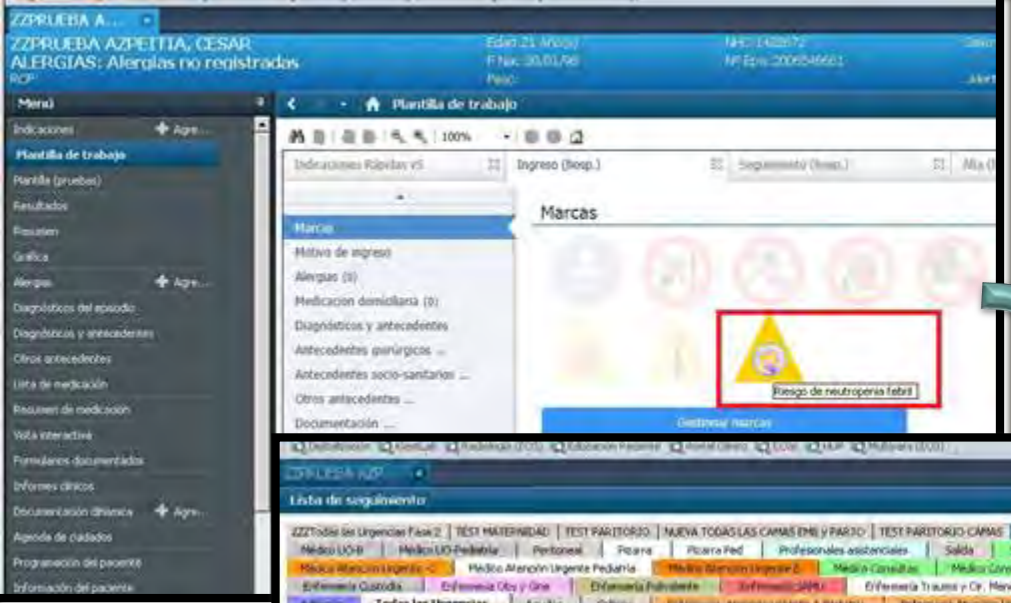
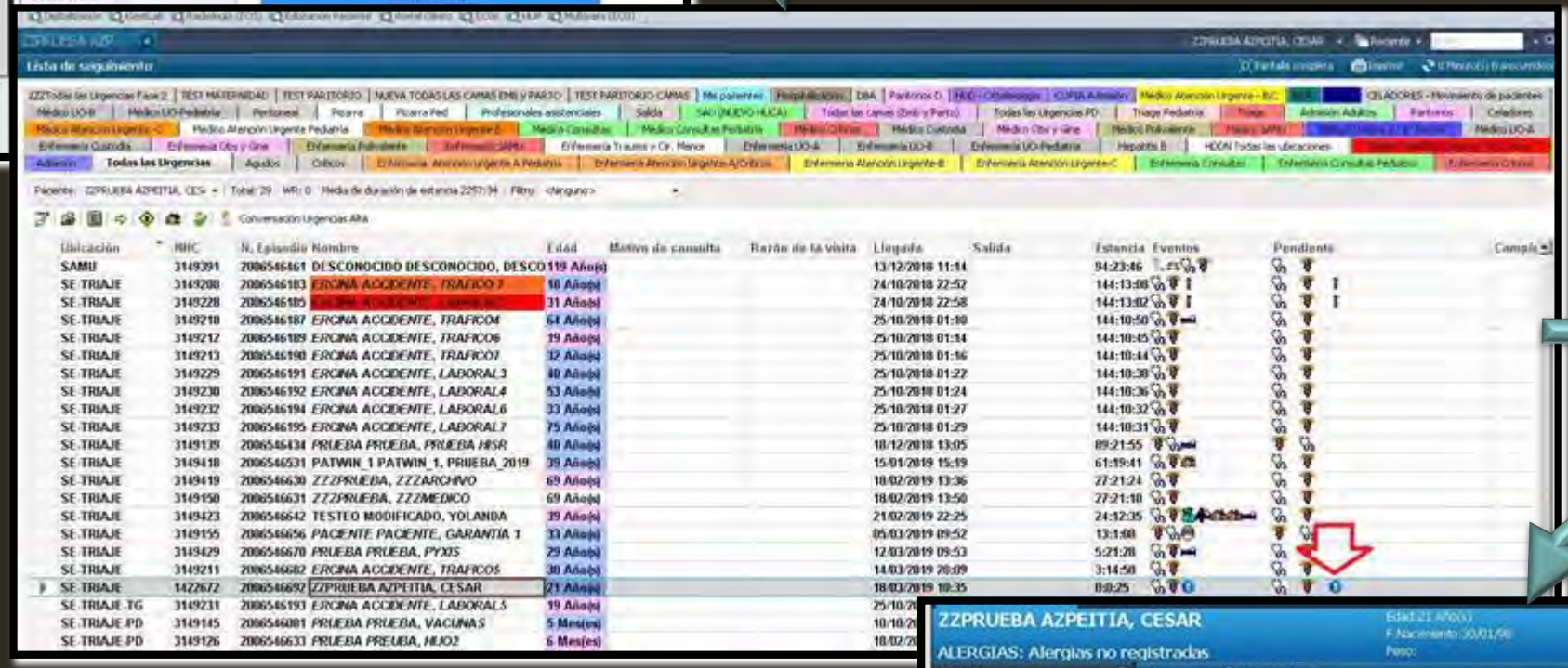



Mark visible in the patient tracking list in ER

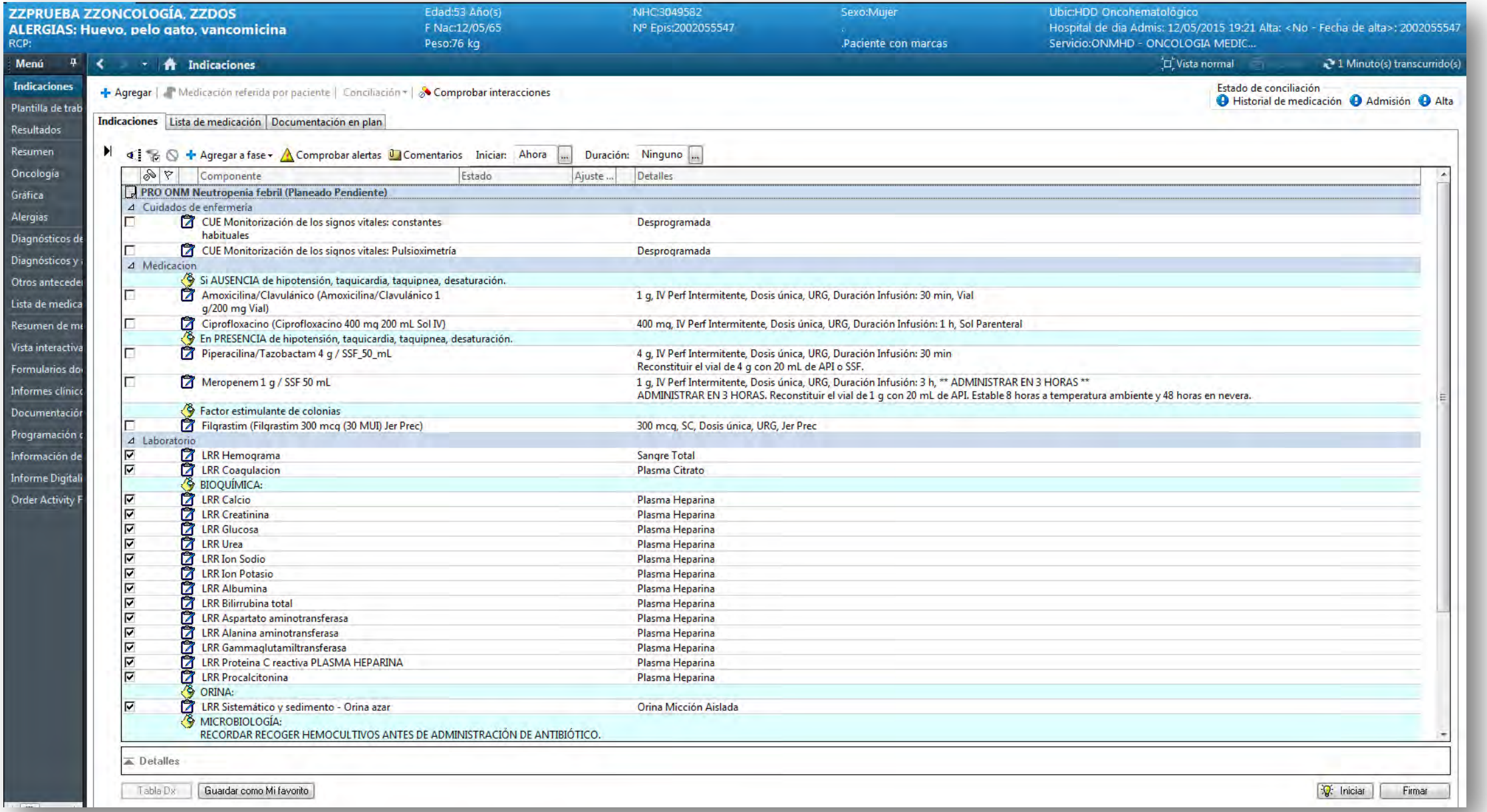
Automatically generates a task for ER staff

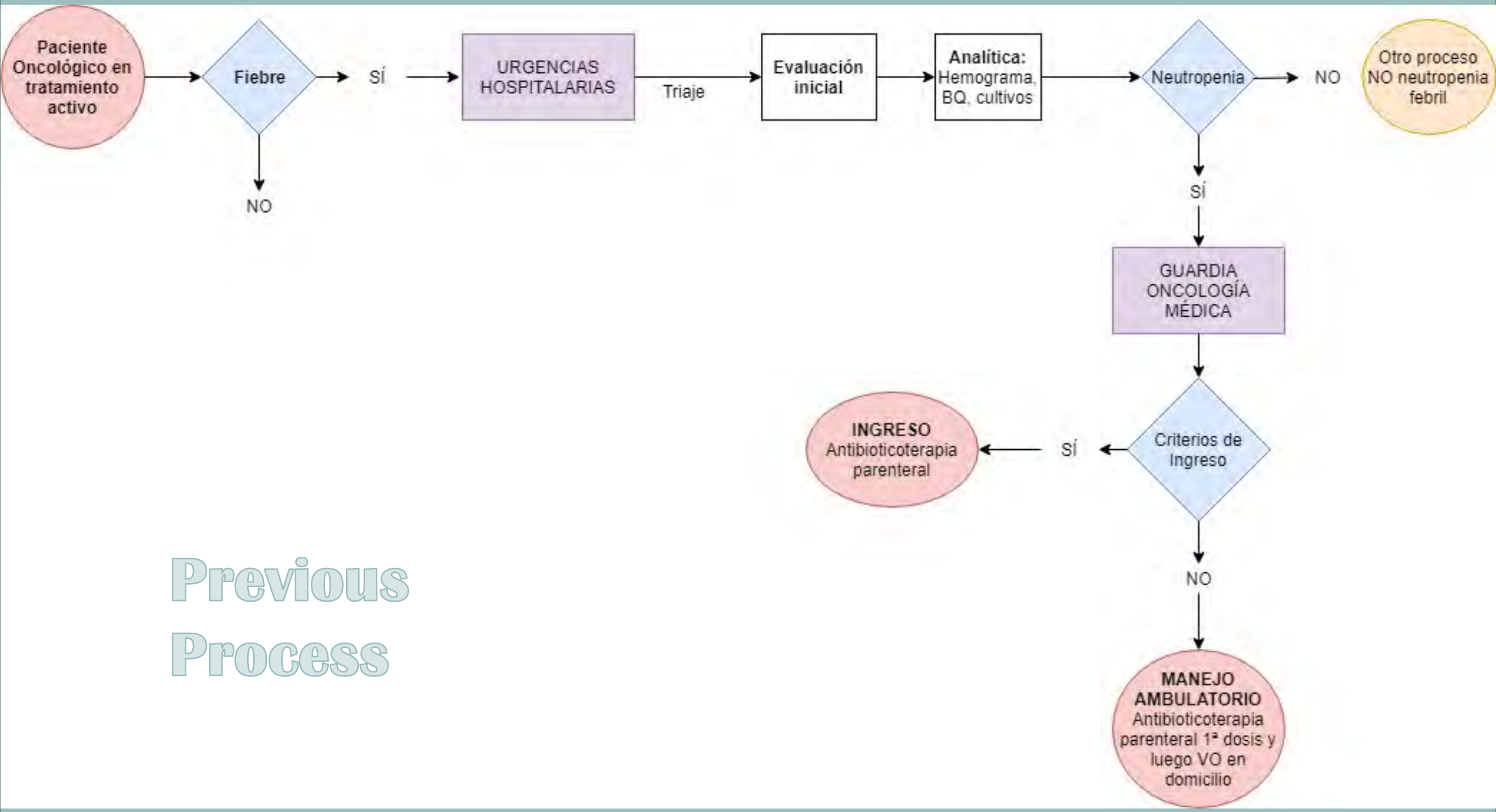
# POWERPLAN

Se **INDICA** por el facultativo en urgencias

- PRO ONM Neutropenia Febril
- Se ha incorporado a las peticiones rápidas de urgencias

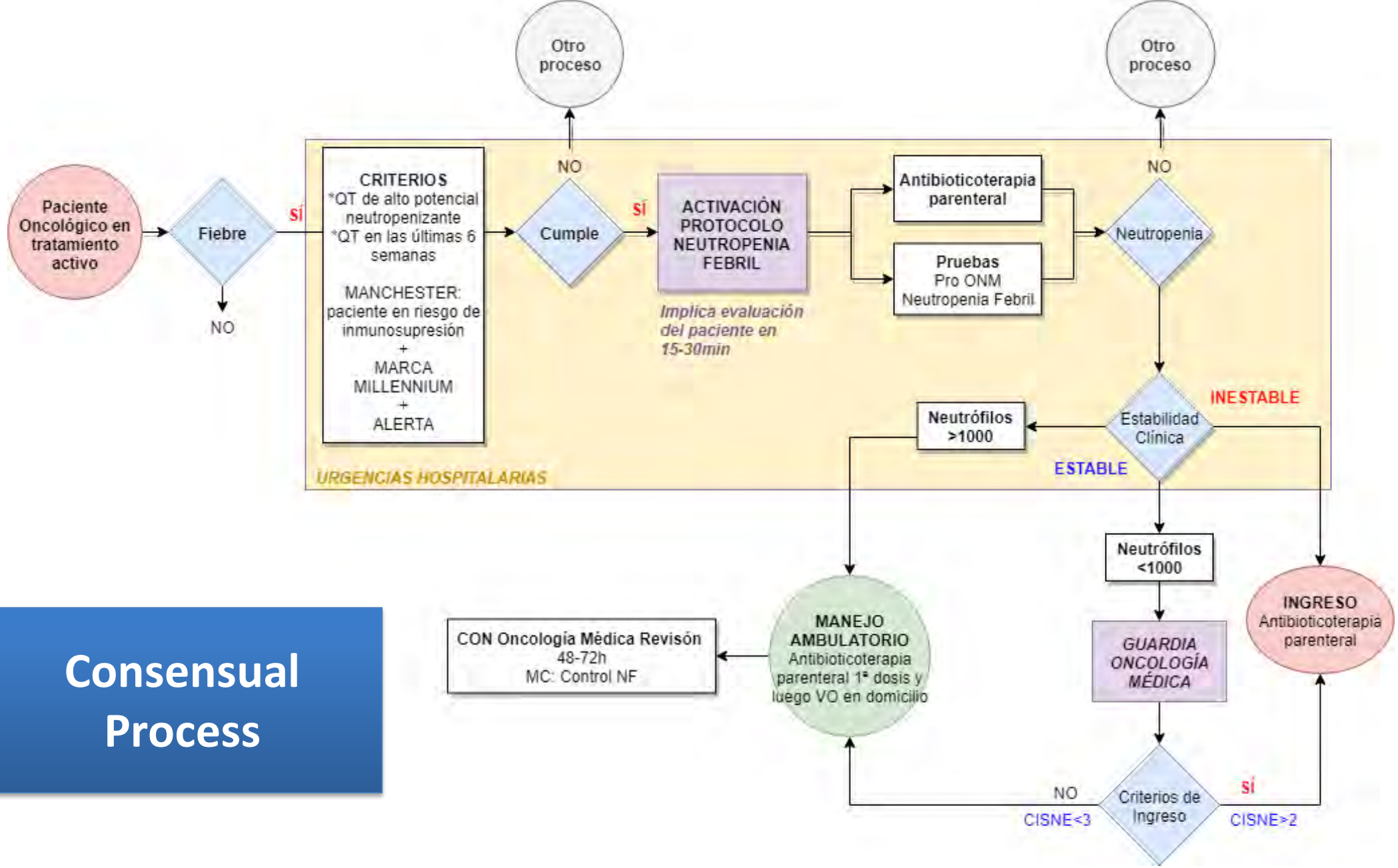
| CATEGORÍA | PARÁMETROS |
|---|---|
| Cuidados Enfermería | ☑ Constantes vitales: TA, FC, FR, T°, Pulsioximetría<br>Colocar mascarilla |
| Analítica LRR | ☑ Hemograma |
| | ☑ Coagulación |
| | ☑ Bioquímica:<br>Glucosa, Urea, Creatinina, Sodio, Potasio<br>Calcio, Albúmina, PCR, Procalcitonina<br>Bilirrubina total y directa, AST, ALT, GGT |
| | ☑ Orina: sistemático y sedimento |
| Microbiología | ☑ Hemocultivo periférico 1º |
| | ☑ Hemocultivo periférico 2º |
| | ☐ Hemocultivo central |
| | ☑ Urinocultivo micción |
| | ☐ Urinocultivo catéter |
| | ☐ Heces toxina clostridium |
| | ☐ Heces coprocultivo |
| Radiología | ☑ Rx PA y lateral de tórax |
| | ☑ Rx simple (AP) de abdomen |
| Antibioticoterapia inicial | ☐ **Amoxicilina/Clavulánico** 1g IV dosis única URG<br>**Ciprofloxacino** 400mg IV dosis única URG |
| | ☐ **Piperacilina/Tazobactam** 4/0.5 g IV dosis única URG<br>☐ **Meropenem** 1g IV dosis única URG |
| Factor estimulante de colonias | ☐ **Filgrastim** 30MUI SC dosis única URG |


ZZPRUEBA ZZONCOLOGÍA, ZZDOS
ALERGIAS: Huevo, pelo gato, vancomicina
RCP:
Edad:53 Año(s)
F Nac:12/05/65
Peso:76 kg
NHC:3049582
Nº Epis:2002055547
Sexo:Mujer
.Paciente con marcas
Ubic:HDD Oncohematológico
Hospital de dia Admis: 12/05/2015 19:21 Alta: <No - Fecha de alta>: 2002055547
Servicio:ONMHD - ONCOLOGIA MEDIC...
Menú
Indicaciones
Vista normal
1 Minuto(s) transcurrido(s)
Agregar | Medicación referida por paciente | Conciliación | Comprobar interacciones
Estado de conciliación
Historial de medicación
Admisión
Alta
Indicaciones
Lista de medicación
Documentación en plan
Agregar a fase
Comprobar alertas
Comentarios
Iniciar: Ahora
Duración: Ninguno
Componente
Estado
Ajuste ...
Detalles
PRO ONM Neutropenia febril (Planeado Pendiente)
Cuidados de enfermería
CUE Monitorización de los signos vitales: constantes habituales
Desprogramada
CUE Monitorización de los signos vitales: Pulsioximetría
Desprogramada
Medicación
Si AUSENCIA de hipotensión, taquicardia, taquipnea, desaturación.
Amoxicilina/Clavulánico (Amoxicilina/Clavulánico 1 g/200 mg Vial)
1 g, IV Perf Intermitente, Dosis única, URG, Duración Infusión: 30 min, Vial
Ciprofloxacino (Ciprofloxacino 400 mg 200 mL Sol IV)
400 mg, IV Perf Intermitente, Dosis única, URG, Duración Infusión: 1 h, Sol Parenteral
En PRESENCIA de hipotensión, taquicardia, taquipnea, desaturación.
Piperacilina/Tazobactam 4 g / SSF_50_mL
4 g, IV Perf Intermitente, Dosis única, URG, Duración Infusión: 30 min
Reconstituir el vial de 4 g con 20 mL de API o SSF.
Meropenem 1 g / SSF 50 mL
1 g, IV Perf Intermitente, Dosis única, URG, Duración Infusión: 3 h, ** ADMINISTRAR EN 3 HORAS **
ADMINISTRAR EN 3 HORAS. Reconstituir el vial de 1 g con 20 mL de API. Estable 8 horas a temperatura ambiente y 48 horas en nevera.
Factor estimulante de colonias
Filgrastim (Filgrastim 300 mcg (30 MUI) Jer Prec)
300 mcg, SC, Dosis única, URG, Jer Prec
Laboratorio
LRR Hemograma
Sangre Total
LRR Coagulacion
Plasma Citrato
BIOQUÍMICA:
LRR Calcio
Plasma Heparina
LRR Creatinina
Plasma Heparina
LRR Glucosa
Plasma Heparina
LRR Urea
Plasma Heparina
LRR Ion Sodio
Plasma Heparina
LRR Ion Potasio
Plasma Heparina
LRR Albumina
Plasma Heparina
LRR Bilirrubina total
Plasma Heparina
LRR Aspartato aminotransferasa
Plasma Heparina
LRR Alanina aminotransferasa
Plasma Heparina
LRR Gammaglutamiltransferasa
Plasma Heparina
LRR Proteina C reactiva PLASMA HEPARINA
Plasma Heparina
LRR Procalcitonina
Plasma Heparina
ORINA:
LRR Sistemático y sedimento - Orina azar
Orina Micción Aislada
MICROBIOLOGÍA:
RECORDAR RECOGER HEMOCULTIVOS ANTES DE ADMINISTRACIÓN DE ANTIBIÓTICO.
Detalles
Tabla Dx
Guardar como Mi favorito
Iniciar
Firmar

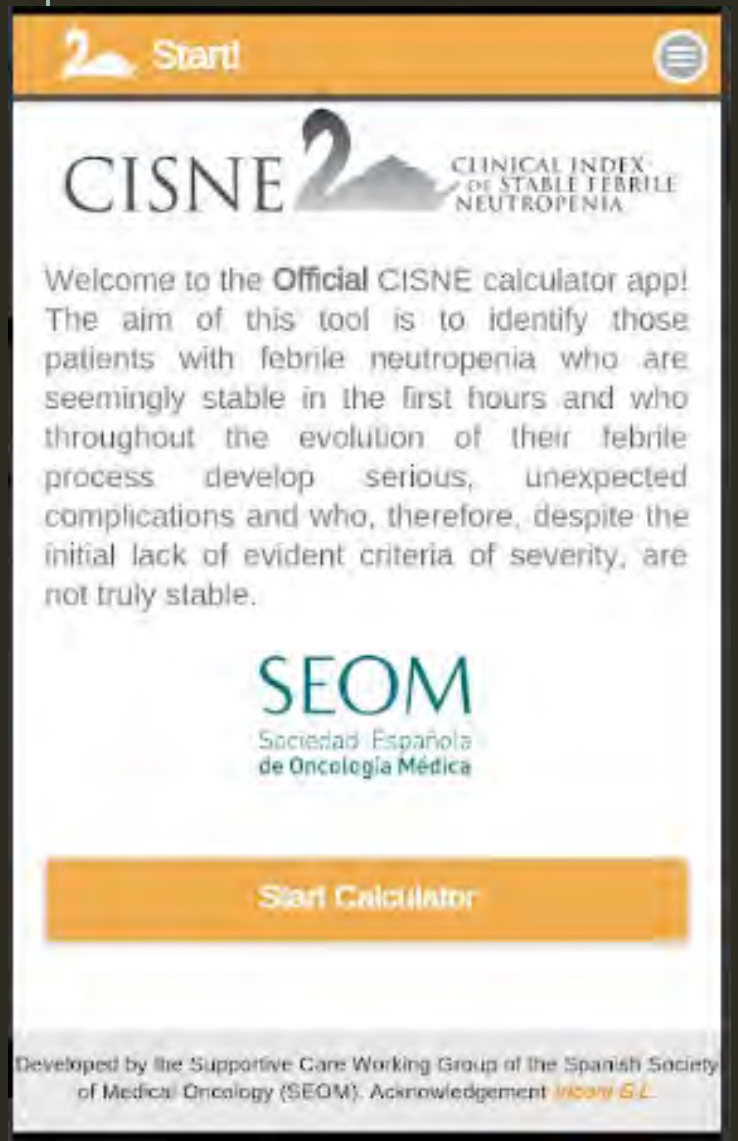


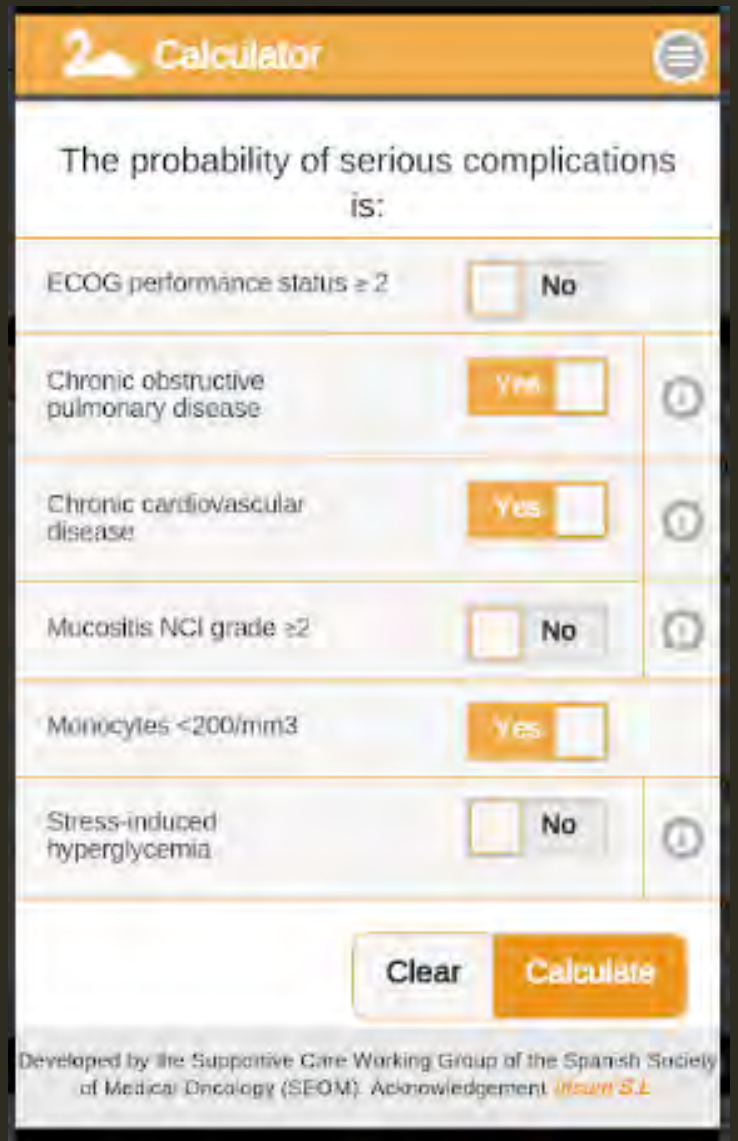

Previous Process

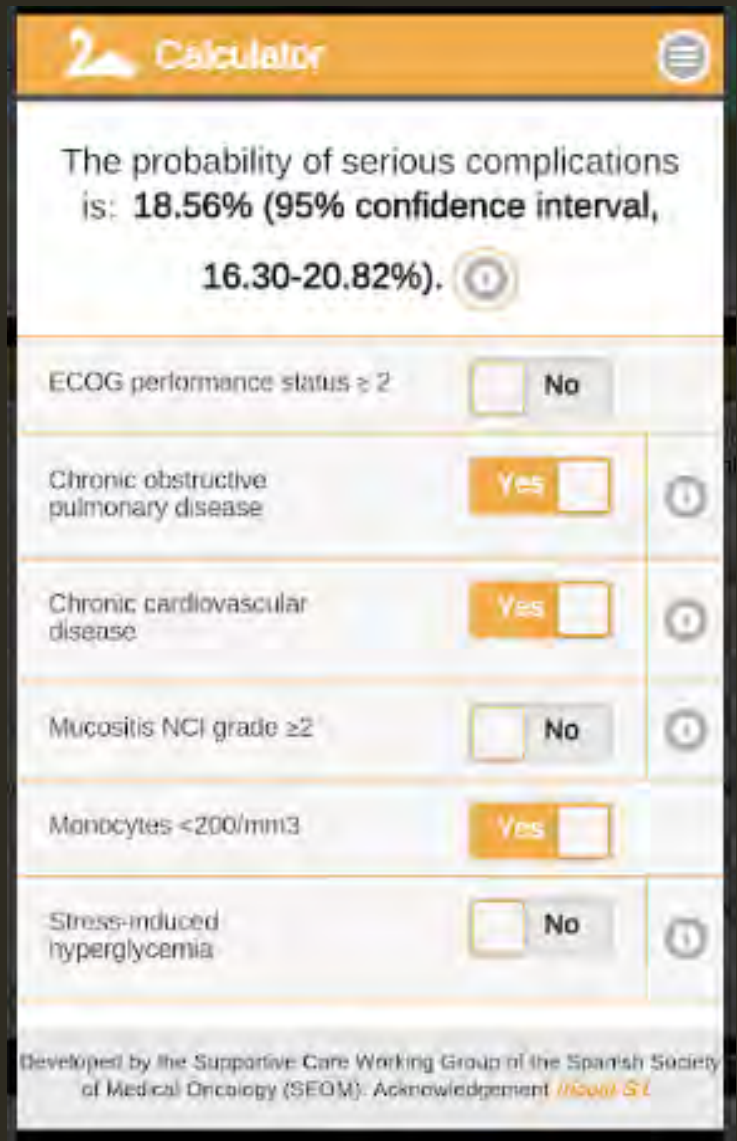
# Consensual Process



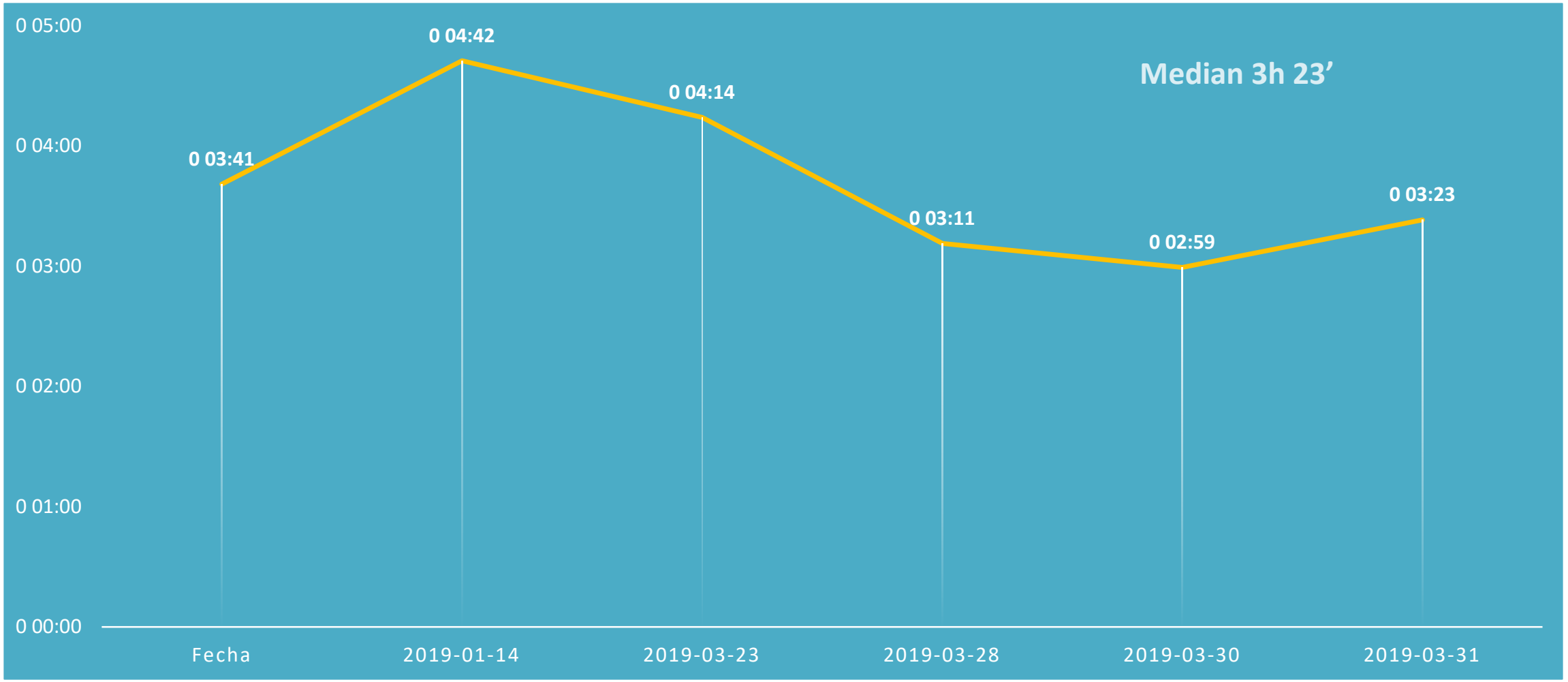
# CISNE *APP*


Start
CISNE
CLINICAL INDEX OF STABLE FEBRILE NEUTROPENIA
Welcome to the Official CISNE calculator app! The aim of this tool is to identify those patients with febrile neutropenia who are seemingly stable in the first hours and who throughout the evolution of their febrile process develop serious, unexpected complications and who, therefore, despite the initial lack of evident criteria of severity, are not truly stable.
SEOM
Sociedad Española de Oncología Médica
Start Calculator
Developed by the Supportive Care Working Group of the Spanish Society of Medical Oncology (SEOM). Acknowledgement Incyte S.L.


Calculator
The probability of serious complications is:
ECOG performance status ≥ 2 No
Chronic obstructive pulmonary disease Yes
Chronic cardiovascular disease Yes
Mucositis NCI grade ≥2 No
Monocytes <200/mm3 Yes
Stress-induced hyperglycemia No
Clear
Calculate
Developed by the Supportive Care Working Group of the Spanish Society of Medical Oncology (SEOM). Acknowledgement Incyte S.L.


Calculator
The probability of serious complications is: 18.56% (95% confidence interval, 16.30-20.82%).
ECOG performance status ≥ 2 No
Chronic obstructive pulmonary disease Yes
Chronic cardiovascular disease Yes
Mucositis NCI grade ≥2 No
Monocytes <200/mm3 Yes
Stress-induced hyperglycemia No
Developed by the Supportive Care Working Group of the Spanish Society of Medical Oncology (SEOM). Acknowledgement Incyte S.L.

# Change Data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0 04:00
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Median 3h 23’
Fecha
2019-01-14
2019-03-23
2019-03-28
2019-03-30
2019-03-31

# Conclusions

- Patients with Febrile Neutropenia risk will be attended at the ER Service through the new optimized protocol and process.
- Day Care Hospital declared itself to be insufficient in material and human resources for the reception of the patient at risk of febrile neutropenia.
  - Nurses consensus and declination of initial proposal.

# Next Steps/Plan for Sustainability

- Trimestral analysis
- Education
  - Health care professionals
  - Patient & caregivers

# *Antibiotic Administration Time Decrease in Urgent Care of Medical Oncology Service being treated with Neutropenic Regimens*

*María del Pilar Solís Hernández*
*Department of Medical Oncology*
SERVICIO DE SALUD DEL PRINCIPADO DE ASTURIAS
Hospital Universitario Central de Asturias

**AIM**: ***Antibiotic administration start during the first hour from admission in 90% of Medical Oncology patients receiving chemotherapy regimens with high risk for Febrile Neutropenia, when presenting fever or under FN suspicion @ ER.***

**INTERVENTION:**

- In order to reduce the time of antibiotic start in immunosuppressed patients when Febrile Neutropenia suspected at the ER service, it was built a workflow that includes patient tag with a specific specific label indicated by the oncologist.
- The patient will receive pertinent written and oral education
- When the patient presents fever and is directed to the ER, once admitted ad “patient at immunosuppression risk” by the Manchester Triage System and rated "very urgent attention“, a special symbol will appear in the patient list and a task will be generated, so ER staff can easily identify this patients, and evaluate them with due priority.
- Additionally, an informatic alert will appear once the history is open.

**TEAM:**

- Medical Oncology: names
  - Emilio Esteban
  - Pilar Solis
- Emergency Room:
  - Luis Antuña
- Informática:
  - Francisco Jimeno

**PROJECT SPONSORS:**

- HUCA – SESPA (institution)

**RESULTS:** Our AIM has not been assessed due to short period from implementation

**Graph title**

**CONCLUSIONS:**

- Our AIM has not been assessed due to short period from implementation
- Processes can vary their shape and goals during their development due to diverse causes and actors.

**NEXT STEPS:**

- Trimestral analysis
- Education
  - Health proffesionals
  - Patient & caregivers

ASCO Quality Training Program

HOSPITAL UNIVERSITARIO CENTRAL de ASTURIAS

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