

WHEN TO START
ANTIBIOTICS, ANTIVIRALS AND
ANTIFUNGALS?

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Focus on early and aggressive therapy

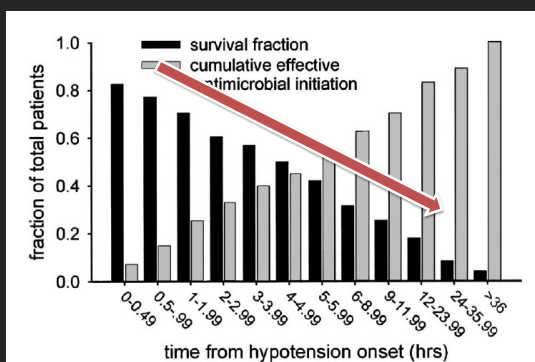
Sepsis treatment

Organ support	Antibiotics	Source control
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Importance of timing of therapy



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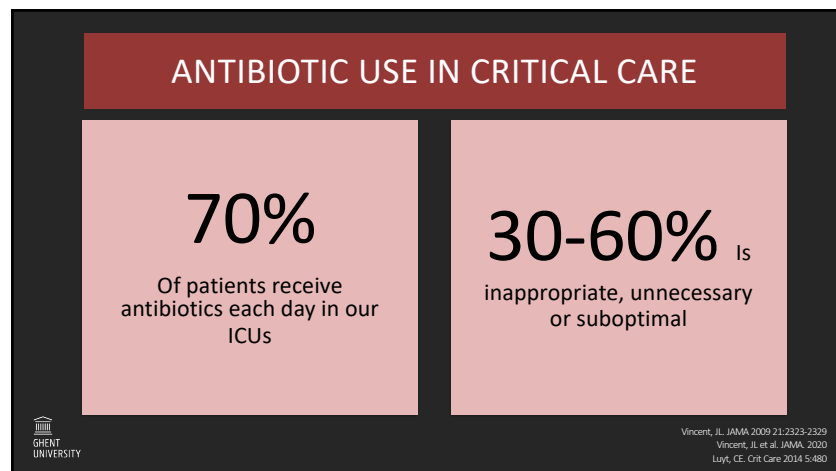
Antibiotics – SSC 2016

We recommend that administration of IV antimicrobials be initiated as soon as possible after recognition and within 1 h for both sepsis and septic shock.

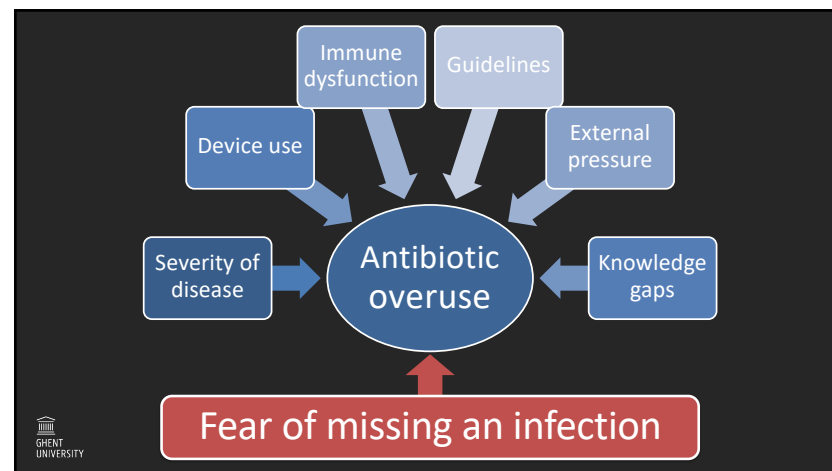
We recommend empiric broad-spectrum therapy with one or more antimicrobials to cover all likely pathogens

We suggest empiric combination therapy (using at least two antimicrobials of different antimicrobial classes) aimed at the most likely bacterial pathogen(s) for the initial management of septic shock.

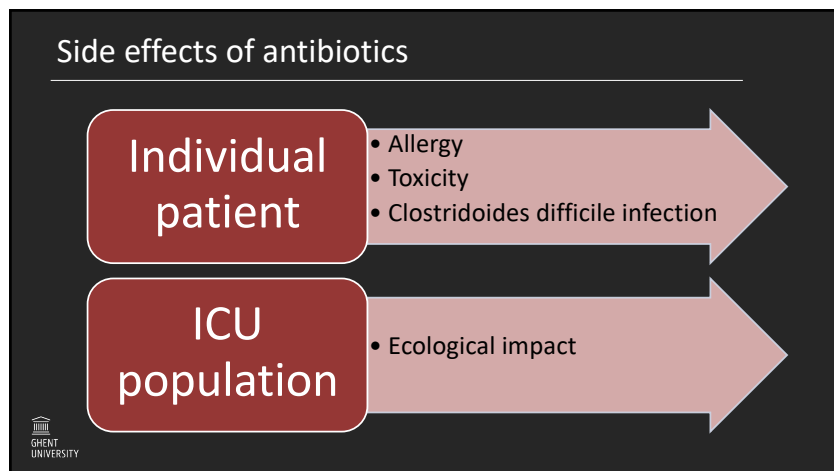
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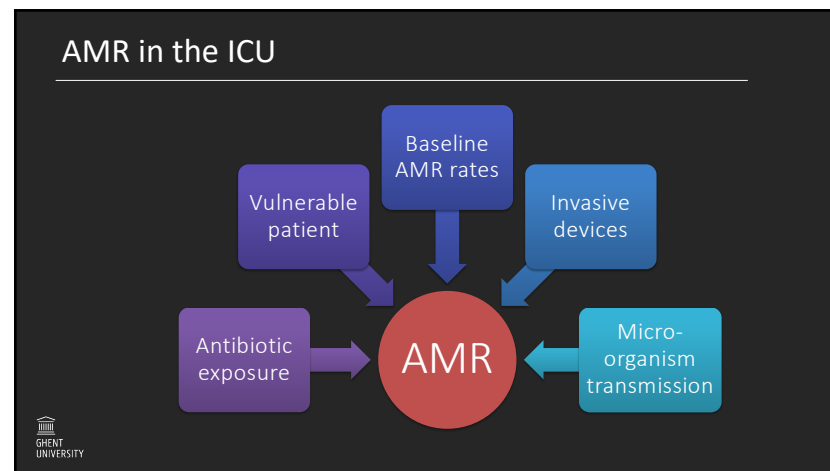
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Antimicrobial Stewardship for Severe Infections Learning Pathway

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The Antimicrobial Stewardship (AMS) for Severe Infections Learning Pathway is a new educational grant that aims to facilitate understanding on the importance of antibiotic stewardship in the ICU, the role of a multidisciplinary and multi-professional approach, as well as the value of the diagnosis in the management of severe infections to avoid or reduce inappropriate use of antimicrobials. A successful ASM requires international cooperation to control further development and spread of resistant pathogens, where the multidisciplinary and multi-professional approach becomes centre stage. The current training programme comes in line with the second key element of the EU guidelines on the prudent use of antimicrobials in human health "Antimicrobial prescribing and stewardship".

The programme proposes a sustainable digital transformation that puts participants at the centre, in line with EU core values and fundamental rights, and will ensure that participants are empowered to enjoy the opportunities that come with the digital decade.

Watch the kick-off webinar on this page to learn more about the programme directly from the expert faculty.

Registrations remain open.

If you are interested in AMS, do not hesitate to register, watch the recordings of the 3 thematic sessions and complete the related quizzes. Upon their completion, you may also download your certificate. CME credits will be issued for the thematic sessions and the AMS workshop in Milan.

Antimicrobial Stewardship for Severe Infections Learning Pathway Kick off webinar

INTRODUCTION

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WHEN **NOT** TO GIVE
ANTIBIOTICS

A woman with short brown hair, wearing a red top, is shown from the waist up. She has her right hand on her head, looking upwards and to the right with a thoughtful expression.

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WHEN THERE IS NO INFECTION.



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Sepsis-3 definitions

SEPSIS

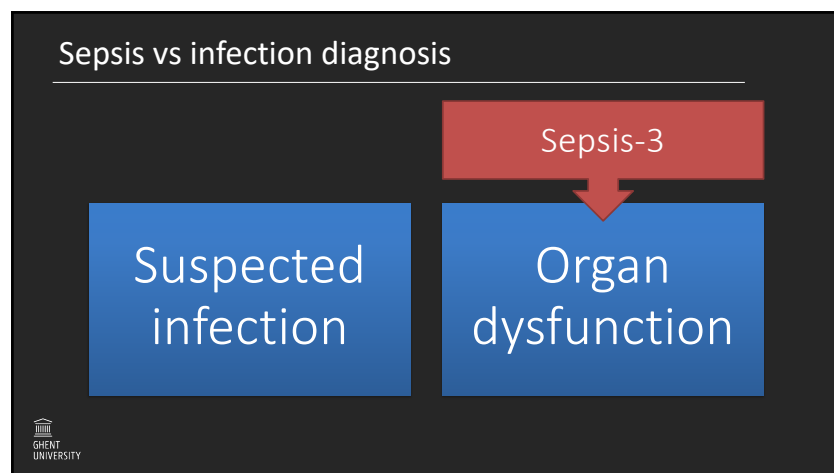
Life-threatening organ dysfunction caused by a dysregulated host response to infection

Acute change in total SOFA score ≥ 2 points consequent to the infection

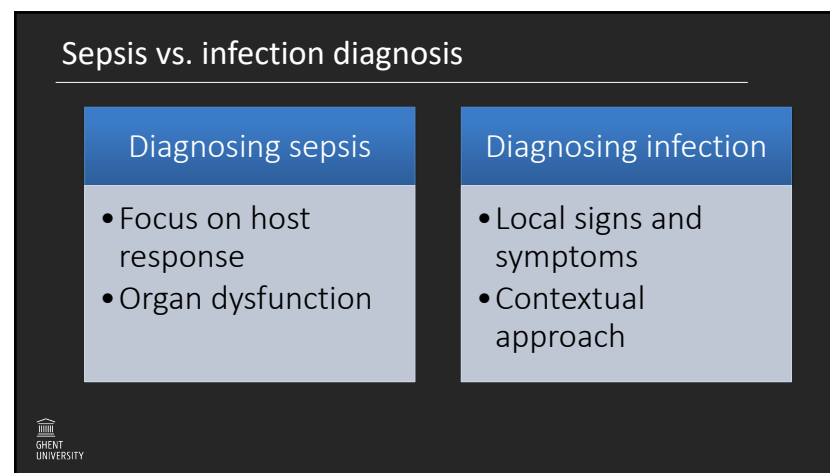


Singer, M. JAMA 2016 8:801-810

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Source identification – how?

Patient history	Clinical evaluation	Lab results	Targeted imaging
<ul style="list-style-type: none"> Comorbidity Immunosuppression Recent surgery Foreign bodies Catheters 	<ul style="list-style-type: none"> Fever pattern Symptoms Physical examination Chest Abdomen 	<ul style="list-style-type: none"> General lab Organ associated alterations Oxygenation Bilirubin 	<ul style="list-style-type: none"> Conventional CT scan Ultrasound
<ul style="list-style-type: none"> Implants 	<ul style="list-style-type: none"> Surgical wounds Drains Extremities 	<ul style="list-style-type: none"> Renal failure CK Coagulation 	

INTEGRATION



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Infection diagnosis – 60 sec sepsis survey

Focus on source of infection

Pulmonary

Abdominal


UTI

Catheter

Neuro

Skin/wounds

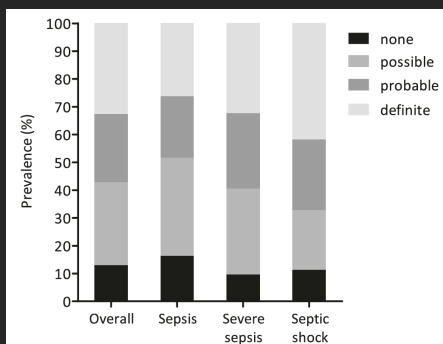
Undetermined



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Are we sure the patient has infection?

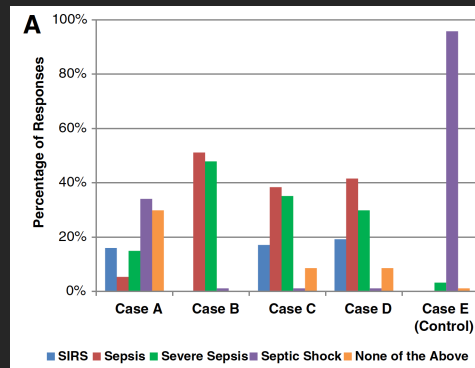
Plausibility of infection – clinical diagnosis at ICU admission versus post hoc evaluation



Klein Klouwenberg, PM, Crit Care 2015 319

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Sepsis diagnosis




Rhee, et al. Crit Care 2016 1:89

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Conditions that mimic sepsis are numerous...

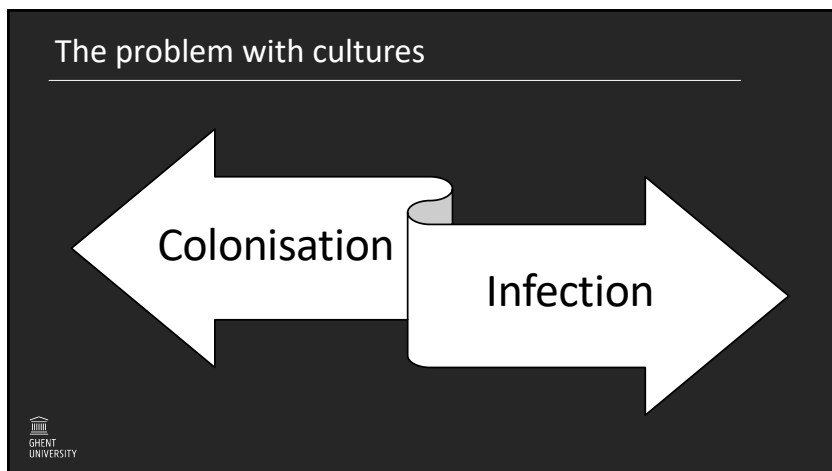
Cardiac disease	Arrhythmias Heart failure Myocardial infarction	Hematologic/ oncologic disease	Antiphospholipid syndrome Malignancy Hemophagocytic syndrome Tumor lysis syndrome
Pulmonary disease	Acute respiratory distress syndrome Aspiration pneumonitis Asthma exacerbation Bronchiectasis exacerbation Chronic obstructive pulmonary disease exacerbation Interstitial lung disease flare Hypersensitivity pneumonitis Pulmonary embolism	Rheumatologic/ autoimmune disease	Gout Rheumatoid arthritis Still's disease Systemic lupus erythematosus Vasculitis
Gastrointestinal disease	Acute liver failure Bowel obstruction Gastrointestinal hemorrhage Inflammatory bowel disease Mesenteric ischemia Pancreatitis Volvulus	Drugs/toxins	Drug overdose Drug/alcohol withdrawal Hypersensitivity drug reaction Medication toxicity Malignant hyperthermia Neuroleptic malignant syndrome Serotonin syndrome
Central nervous system disease	Autonomic dysfunction Seizure Stroke/intracranial hemorrhage	Other	Allotransplant rejection (solid organ transplant recipients) Anaphylaxis Compartment syndrome Heat stroke Hemorrhage Hypovolemia Postoperative period Severe burns Tissue ischemia
Endocrine disease	Adrenal insufficiency Diabetic ketoacidosis Myxedema coma Thyroid storm		

 Rhee, C et al. Clin Infect Dis. 2020

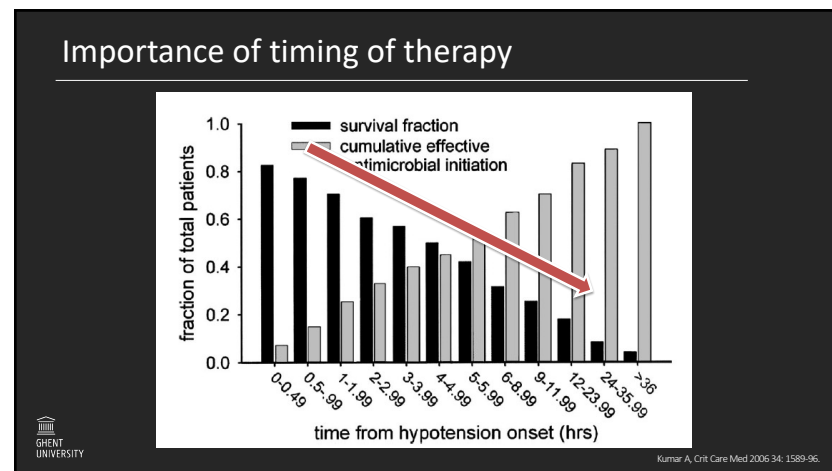
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Time to antibiotics in the ED

Condition	Findings
Sepsis	Increase in mortality with delay of antibiotics, particularly in septic shock No cut-off time point identified Quality of evidence low
Bacterial meningitis	Association between delay and poor outcome Confounders present in all studies
LRTI	Delay of 4-8 hours associated with worse outcomes Biases common
UTI	No studies on timing of antibiotic therapy

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GUIDELINES

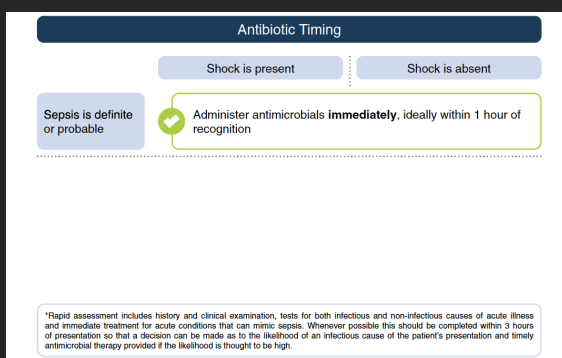
Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021



Laura Evans^{1*}, Andrew Rhodes², Waleed Alhazzani³, Massimo Antonelli⁴, Craig M. Coopersmith⁵, Craig French⁶, Flávia R. Machado⁷, Lauralyn McIntyre⁸, Marlies Ostermann⁹, Hallie C. Prescott¹⁰, Christa Schorr¹¹, Steven Simpson¹², W. Joost Wiersinga¹³, Faye Alshamsi¹⁴, Derek C. Angus¹⁵, Yaseen Arabi¹⁶, Luciano Azevedo¹⁷, Richard Beale⁹, Gregory Beilman¹⁸, Emilie Belley-Cote¹⁹, Lisa Burry²⁰, Maurizio Cecconi^{21,22}, John Centofanti²³, Angel Coz Yataco²⁴, Jan De Waele²⁵, R. Phillip Dellinger¹¹, Kent Doi²⁶, Bin Du²⁷,

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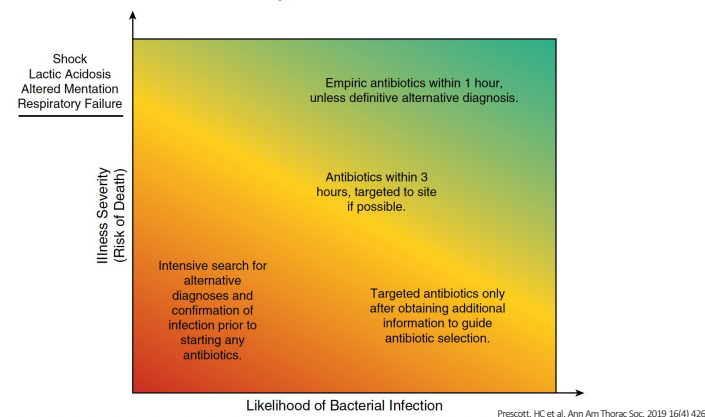
Antibiotic timing – SSC2021



Evans, L et al. Intensive Care Med. 2021

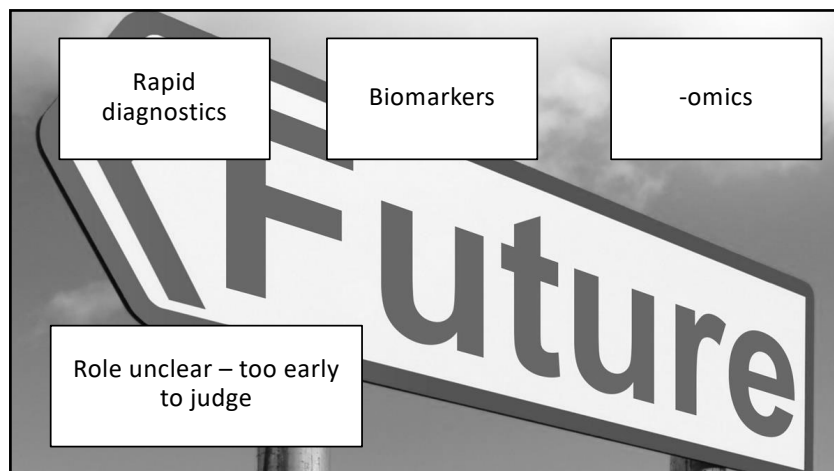
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Framework for Timing and Breadth of Initial Antimicrobials



Prescott, HC et al. Ann Am Thorac Soc. 2019 16(4) 426.

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In summary

- Antimicrobial overuse is a problem in every ICU
- Infection diagnosis is challenging but essential
- Antibiotics are for infections
- Biomarkers are not helpful
- Walk, don't run



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