

Rational idea for obtaining hemoculture

Ext.กนกกร กรเพชรปาณี

Ext.ปวีณ์นุช วิวัฒน์บวร

Ext.ศุภณัฐ อนุวัตรระกูล

Overview

- Background
- Method
- Result
- Conclusion

Background

Background

- โรงพยาบาลสอยดาวมีการส่งตรวจทางห้องปฏิบัติการจำนวนมาก เนื่องจากความจำเป็นในการใช้วินิจฉัยและรักษาโรค ทั้งนี้การส่งตรวจ **hemoculture** เป็นหนึ่งในการส่งตรวจที่ไม่สามารถทำได้เองในโรงพยาบาล แต่ก็เป็นการส่งตรวจที่สำคัญและจำเป็นต้องทำในหลายกรณี
- ในปีงบประมาณ 2560 (1/10/2560 – 30/9/2561) โรงพยาบาลสอยดาวได้ส่งตรวจ **hemoculture** ทั้งหมด 645 เคส

**Is a clinical decision rule for
obtaining hemoculture appropriate
for Soidow hospital?**

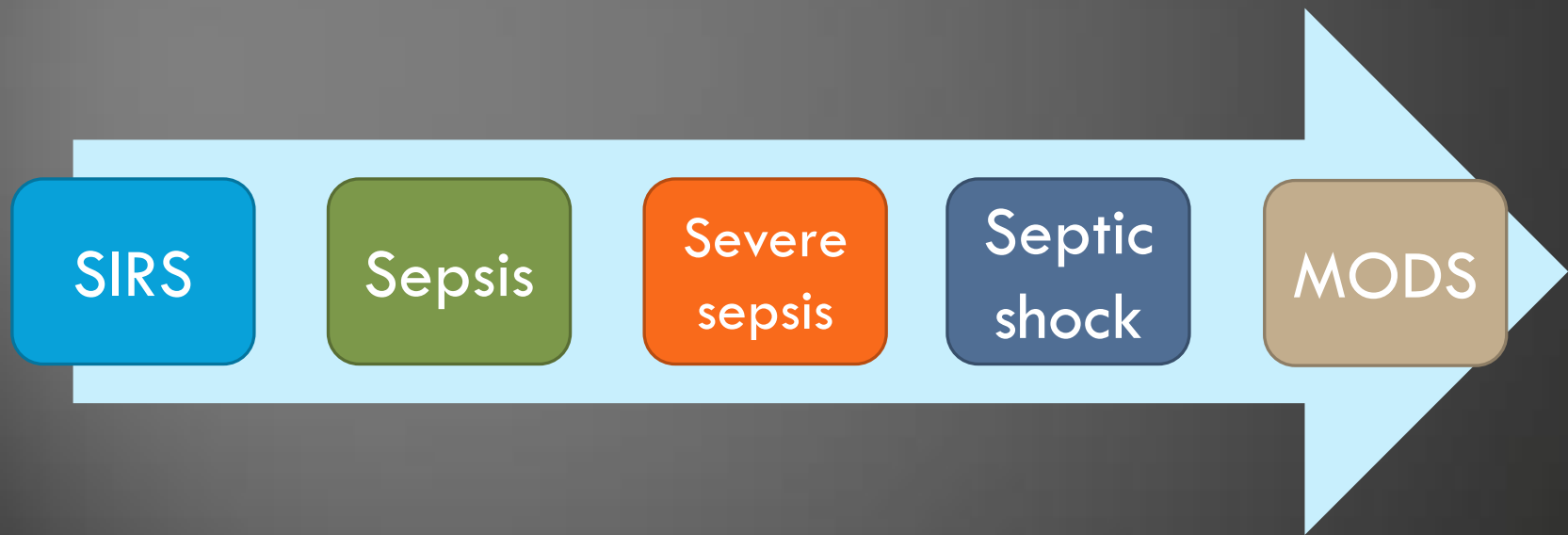
Indication for obtaining blood culture



SIRS qSOFA SOS

SIRS (Systemic Inflammatory Response Syndrome)

- American College of Chest Physicians and the Society of Critical Care Medicine (ACCP/SCCM) 1990 Consensus Conference



SIRS (Systemic Inflammatory Response Syndrome)

- BT $>38^{\circ}\text{c}$ or $<36^{\circ}\text{c}$
- HR >90 bpm
- RR $>20/\text{min}$
- WBC $>12000/\text{mm}^2$ or $<4000/\text{mm}^2$ or immature neutrophil $>10\%$
- SIRS can be caused by infection(sepsis), trauma, burns, pancreatitis

SOFA Score (sequential organ failure assessment)

The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)

[Mervyn Singer](#), MD, FRCP, [Clifford S. Deutschman](#), MD, MS, [Christopher Warren Seymour](#), MD, MSc, [Manu Shankar-Hari](#), MSc, MD, FFICM, [Djillali Annane](#), MD, PhD, [Michael Bauer](#), MD, [Rinaldo Bellomo](#), MD, [Gordon R. Bernard](#), MD, [Jean-Daniel Chiche](#), MD, PhD, [Craig M. Coopersmith](#), MD, [Richard S. Hotchkiss](#), MD, [Mitchell M. Levy](#), MD, [John C. Marshall](#), MD, [Greg S. Martin](#), MD, MSc, [Steven M. Opal](#), MD, [Gordon D. Rubenfeld](#), MD, MS, [Tom van der Poll](#), MD, PhD, [Jean-Louis Vincent](#), MD, PhD, and [Derek C. Angus](#), MD, MPH

[Author information](#) ► [Copyright and License information](#) ► [Disclaimer](#)

- SOFA score(sequential organ failure assessment) change ≥ 2 scores
- qSOFA $\geq 2/3$
 - Alteration in mental status / GCS <15
 - SBP ≤ 100 mmHg
 - RR $\geq 22/\text{min}$

Table 1. Sequential [Sepsis-Related] Organ Failure Assessment Score^a

System	Score				
	0	1	2	3	4
Respiration					
Pao ₂ /Fio ₂ , mm Hg (kPa)	≥400 (53.3)	<400 (53.3)	<300 (40)	<200 (26.7) with respiratory support	<100 (13.3) with respiratory support
Coagulation					
Platelets, ×10 ³ /μL	≥150	<150	<100	<50	<20
Liver					
Bilirubin, mg/dL (μmol/L)	<1.2 (20)	1.2-1.9 (20-32)	2.0-5.9 (33-101)	6.0-11.9 (102-204)	>12.0 (204)
Cardiovascular	MAP ≥70 mm Hg	MAP <70 mm Hg	Dopamine <5 or dobutamine (any dose) ^b	Dopamine 5.1-15 or epinephrine ≤0.1 or norepinephrine ≤0.1 ^b	Dopamine >15 or epinephrine >0.1 or norepinephrine >0.1 ^b
Central nervous system					
Glasgow Coma Scale score ^c	15	13-14	10-12	6-9	<6
Renal					
Creatinine, mg/dL (μmol/L)	<1.2 (110)	1.2-1.9 (110-170)	2.0-3.4 (171-299)	3.5-4.9 (300-440)	>5.0 (440)
Urine output, mL/d				<500	<200

Abbreviations: Fio₂, fraction of inspired oxygen; MAP, mean arterial pressure; Pao₂, partial pressure of oxygen.

^a Adapted from Vincent et al.²⁷

^b Catecholamine doses are given as μg/kg/min for at least 1 hour.

^c Glasgow Coma Scale scores range from 3-15; higher score indicates better neurological function.

SOS score

 SOS SCORE (SEARCH OUT SEVERITY SCORE)							
score	3	2	1	0	1	2	3
Temp		≤35	35.1-36	36.1-38	38.1-38.4	≥38.5	
Sys BP	≤80	81-90	91-100	101-180	181-199	≥200	On vasopressor
HR	≤40		41-50	51-100	101-120	121-139	≥140
RR	≤8	On ventilator		9-20	21-25	26-35	≥35
Neuro			New Confusion Agitation	A Alert	V Respond to voice	P Respond to pain	U unresponsiveness
Urine/day or Urine/8 hr or Urine/4 hr or Urine/1 hr		≤500 ≤160 ≤80 ≤20	501-999 161-319 81-159 21-39	≥ 1,000 ≥ 320 ≥160 ≥40	Add urine in score when SOS ≥ 2		

SEPSIS

- Life-threatening organ dysfunction caused by a dysregulated host response to infection
- SIRS with evidence of infection
- SOFA score(sequential organ failure assessment) change ≥ 2 scores
- qSOFA $\geq 2/3$
 - Alteration in mental status / GCS <15
 - SBP ≤ 100 mmHg
 - RR ≥ 22 /min

SIRS

Methods

Methods

- There is retrospective and descriptives study
- Chart and Electronic Data base review of patient, admitted at Soidao Hopital, with obtain hemoculture and documented from October 1,2016 to September 30,2017 was done

Methods

- Review 338 charts from 645 charts
- Selected by randomization method
- Can't access history 3 patients
- Patients were enrolled to our review

338 patients

Can't assess
3 patients

335 patients

SIRS 255

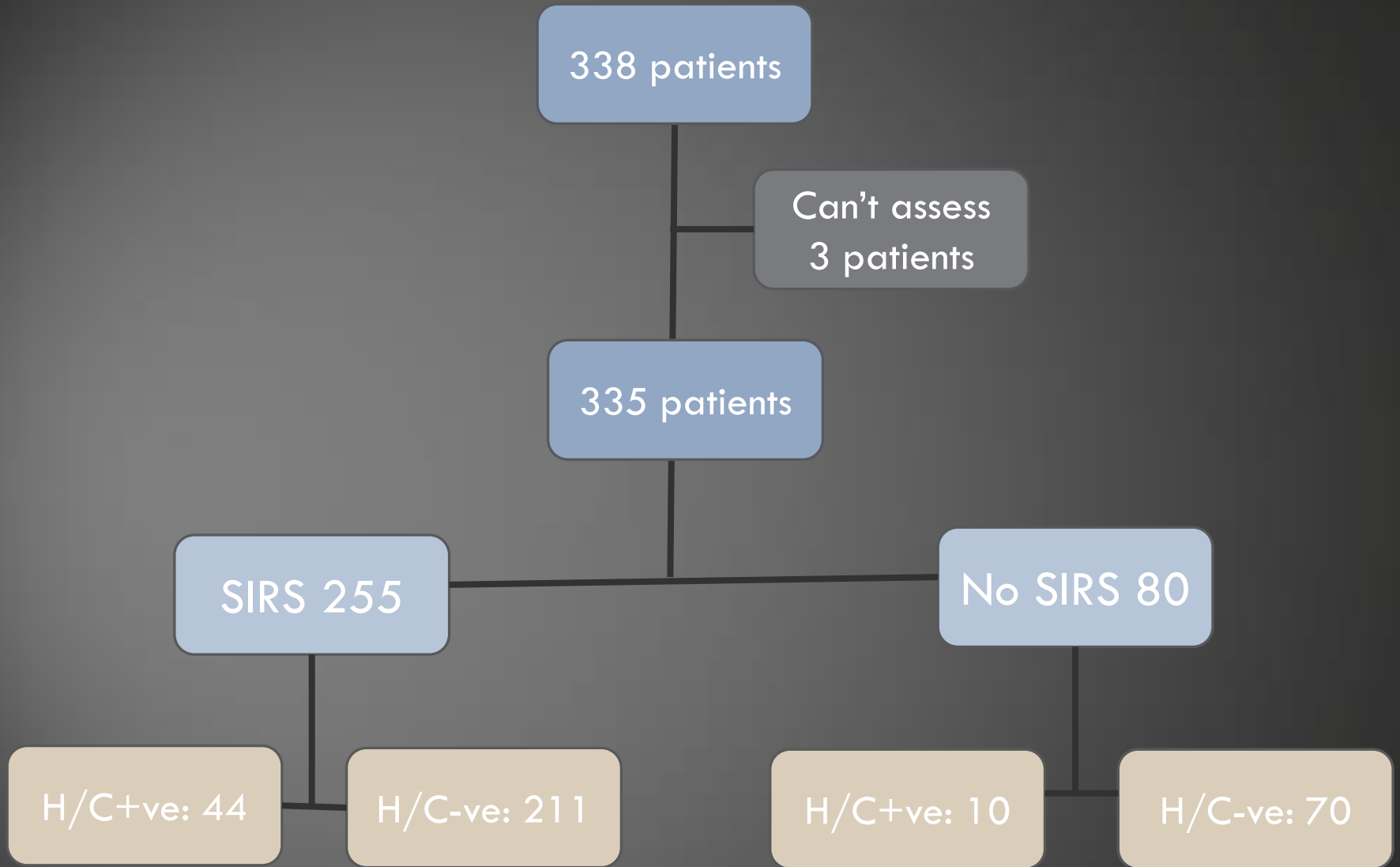
No SIRS 80

H/C+ve: 44

H/C-ve: 211

H/C+ve: 10

H/C-ve: 70



Result

Results & Discussions

- In our review, we separate population into 2 groups
 - The group that was fulfilled criteria of SIRS
 - The group that was **not** fulfilled criteria of SIRS

Results: SIRS group

- Hemoculture positive : 44
- Hemoculture negative : 211
- Percentage of hemoculture positive(PPV) = 17.25%
- Compared to the last epidemiology from year 2551
 - Percentage of hemoculture positive = 9.27%

Results: No-SIRS group

- Hemoculture positive : 10
- Hemoculture negative : 70
- Percentage of hemoculture negative(NPV) = 87.5%
- Compared to the last epidemiology from year 2551
 - Percentage of hemoculture negative = 93.26%

Results

	Hemoculture +	Hemoculture -	Total
SIRS	44	211	255
No SIRS	10	70	80
Total	54	281	335

Hemoculture “positive”

Pneumonia	15
UTI	10
AGE	9
Acute pyelonephritis	5
Cellulitis, NF	5
SBP	3
Meningitis	2
Cholangitis	1
Unknown	4
Total	54

Conclusion

Conclusion

- Is a clinical decision rule for obtaining hemoculture appropriate for Soidow hospital?
- $255/335 = \underline{76.12\%}$

Conclusion

	Hemoculture +	Hemoculture -	Total
SIRS	44	211	255
No SIRS	10	70	80
Total	54	281	335

- Sensitivity = 81.4%
- Specificity = 24.9%
- Positive predictive value = 17.25%
- Negative predictive value = 87.5%

Acknowledgement

- นพ. ธวัช คงคาลัย ผู้อำนวยการโรงพยาบาลสอยดาว
- แพทย์หญิง ศตพร
- นพ. ธนดล สลักเพชร
- แพทย์หญิง ธนาภรณ์ กอหญากลาง
- พี่ปี
- พี่ห้องแลป

Thank you for your attention