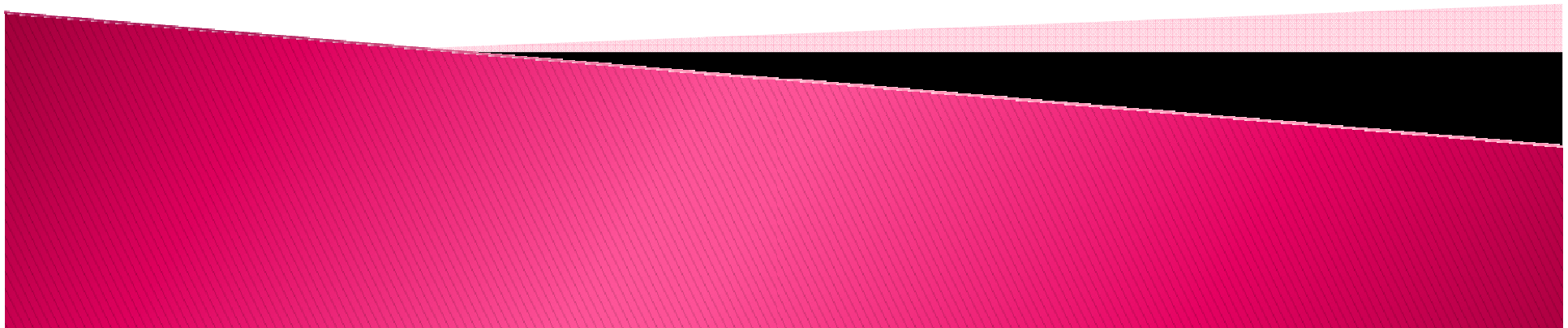


# Rational Idea for Obtaining Hemoculture?

By.....Extern Kanokwan Udomdate  
ExternThanachaporn Kittipibul



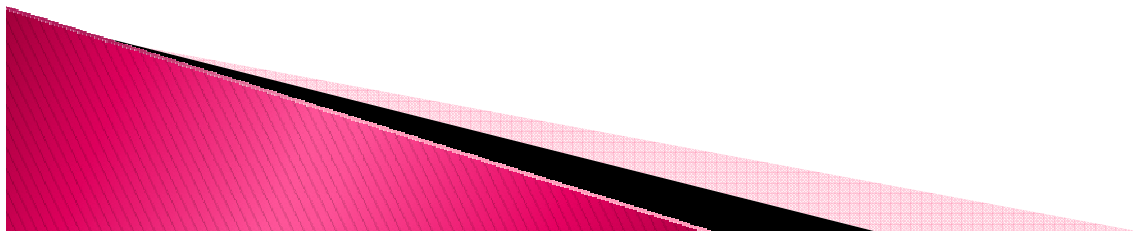
# Background

▶ In 1/10/2550 – 30/09/2551

โรงพยาบาลสอยดาวใช้งบประมาณการตรวจ **Lab**  
เป็นจำนวนมาก โดยสัดส่วนของการส่งตรวจที่มากที่สุดคือ  
การส่งตรวจ **Hemoculture**

- Hemocultures were taken from 550 patients.
- Only 48 specimens were positive

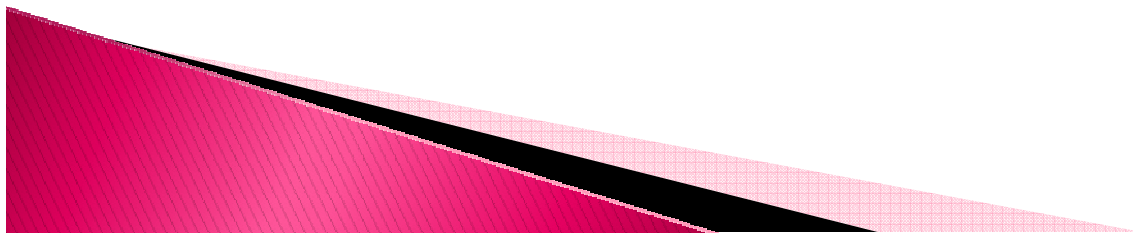
- ▶ There has been growing discussion concerning the **appropriateness of obtaining blood culture in all patient with suspected infection.**
- ▶ Reevaluation of this practice is important due to the rate of **false-positive cultures** as well as the sometimes-limited impact of a true positive culture on clinical management.



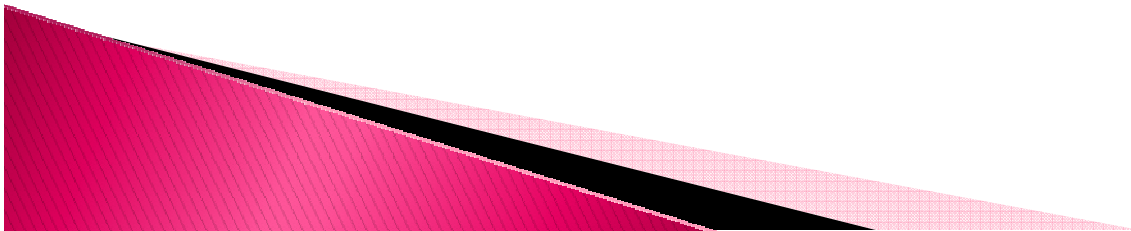
Is a clinical decision rule for  
obtaining blood culture  
appropriate?



- ▶ **Bacteremia and sepsis** are common problems and significant cause of morbidity.
- ▶ Thus, **blood culture are routinely** included in the evaluation of febrile patients.
- ▶ Despite the frequency of this practice, there is sparse evidence relating to **when it is appropriate to order a blood culture.**

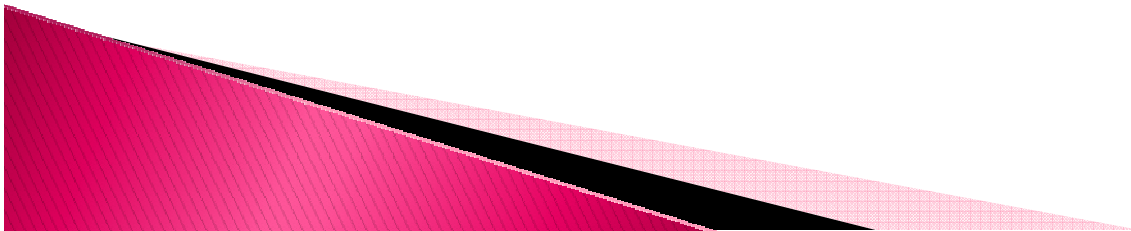


- ▶ Early administration of empiric antibiotics has been shown to be associated with lower mortality.
- ▶ The ability to accurately assess a patient's risk for bacteremia and selectively order blood cultures would be critical and useful.

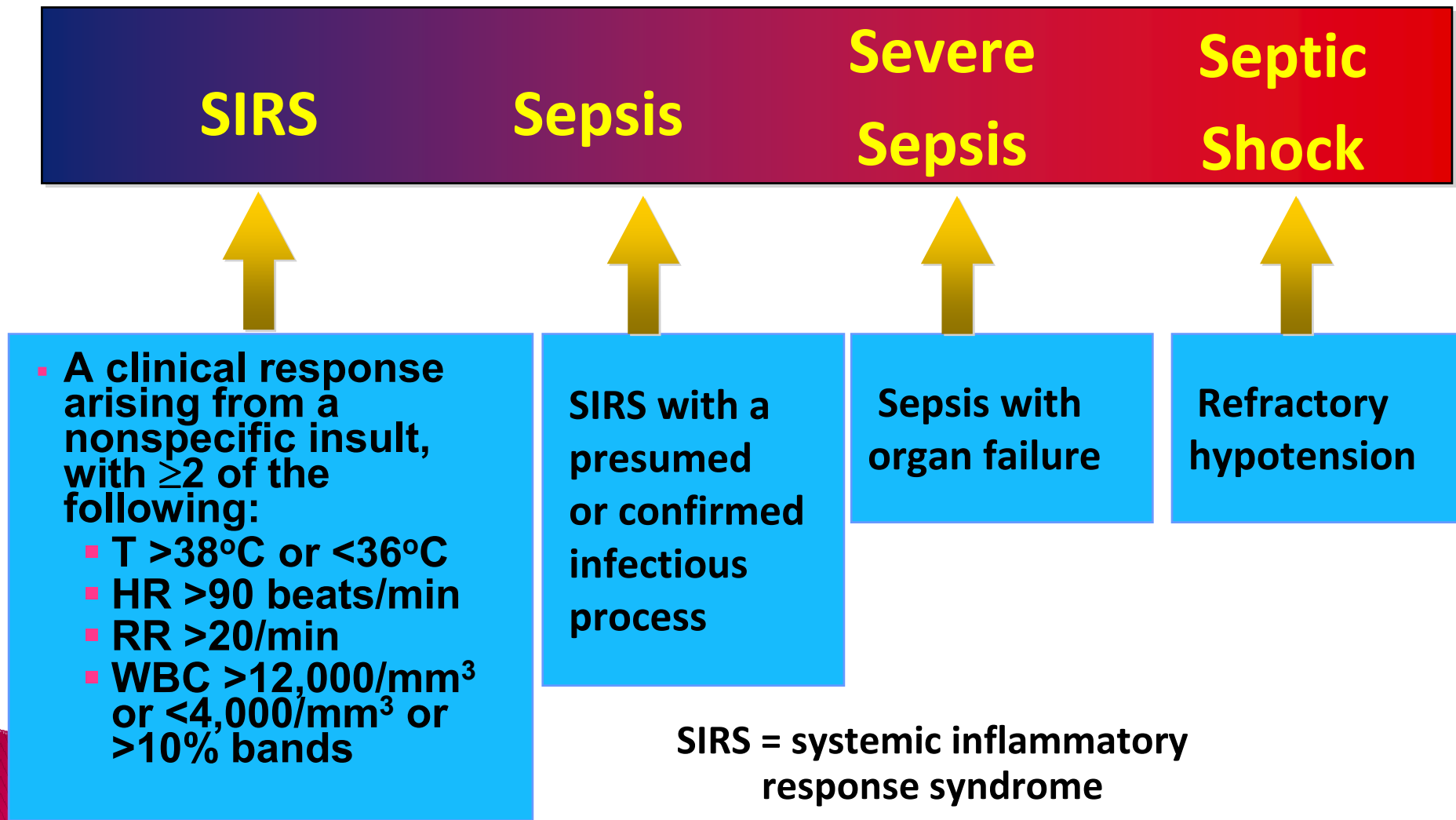


# *SIRS*

- ▶ *systemic inflammatory response syndrome*



# The Sepsis Continuum





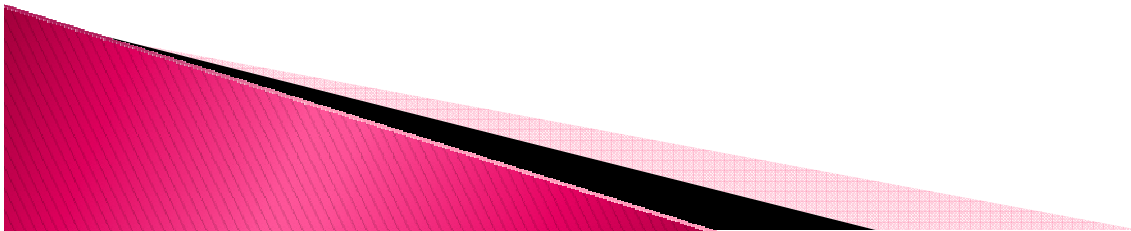
# SIRS

**Table 265-1 Definitions Used to Describe the Condition of Septic Patients**

Bacteremia	Presence of bacteria in blood, as evidenced by positive blood cultures
Septicemia	Presence of microbes or their toxins in blood
Systemic inflammatory response syndrome (SIRS)	Two or more of the following conditions: (1) fever (oral temperature $>38^{\circ}\text{C}$ ) or hypothermia ( $<36^{\circ}\text{C}$ ); (2) tachypnea ( $>24$ breaths/min); (3) tachycardia (heart rate $>90$ beats/min); (4) leukocytosis ( $>12,000/\mu\text{L}$ ), leukopenia ( $<4,000/\mu\text{L}$ ), or $>10\%$ bands; may have a noninfectious etiology
Sepsis	<b>SIRS</b> that has a proven or suspected microbial etiology
Severe sepsis (similar to "sepsis syndrome")	Sepsis with one or more signs of organ dysfunction—for example: <ol style="list-style-type: none"> <li><i>Cardiovascular:</i> Arterial systolic blood pressure <math>\leq 90</math> mmHg or mean arterial pressure <math>\leq 70</math> mmHg that responds to administration of intravenous fluid</li> <li><i>Renal:</i> Urine output <math>&lt;0.5</math> mL/kg per hour for 1 h despite adequate fluid resuscitation</li> <li><i>Respiratory:</i> <math>\text{Pa}_{\text{O}_2}/\text{F}_{\text{I}_{\text{O}_2}} \leq 250</math> or, if the lung is the only dysfunctional organ, <math>\leq 200</math></li> <li><i>Hematologic:</i> Platelet count <math>&lt;80,000/\mu\text{L}</math> or 50% decrease in platelet count from highest value recorded over previous 3 days</li> <li><i>Unexplained metabolic acidosis:</i> A pH <math>\leq 7.30</math> or a base deficit <math>\geq 5.0</math> mEq/L and a plasma lactate level <math>&gt;1.5</math> times upper limit of normal for reporting lab</li> <li><i>Adequate fluid resuscitation:</i> Pulmonary artery wedge pressure <math>\geq 12</math> mmHg or central venous pressure <math>\geq 8</math> mmHg</li> </ol>
Septic shock	Sepsis with hypotension (arterial blood pressure $<90$ mmHg systolic, or 40 mmHg less than patient's normal blood pressure) for at least 1 h despite adequate fluid resuscitation; <i>or</i> Need for vasopressors to maintain systolic blood pressure $\geq 90$ mmHg <i>or</i> mean arterial pressure $\geq 70$ mmHg
Refractory septic shock	Septic shock that lasts for $>1$ h and does not respond to fluid or pressor administration
Multiple-organ dysfunction syndrome (MODS)	Dysfunction of more than one organ, requiring intervention to maintain homeostasis

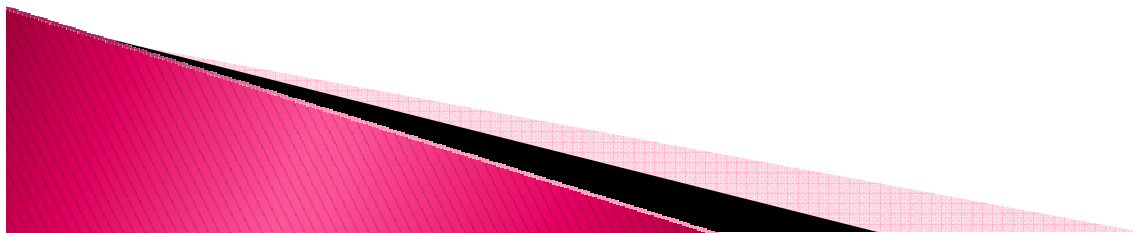
# Objective

- ▶ 1.to assess appropriate of obtaining blood culture by SIRS criteria .

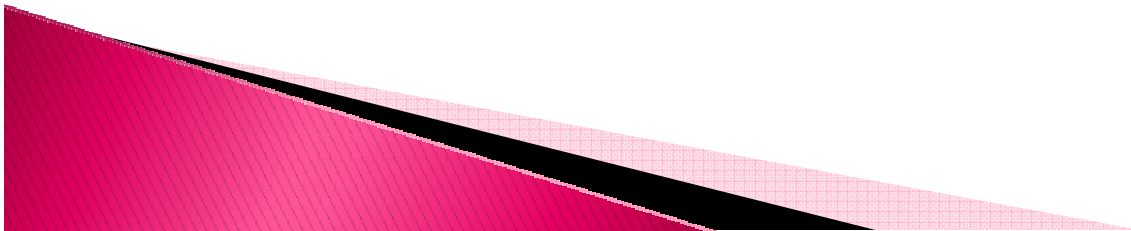


# Materials & Methods

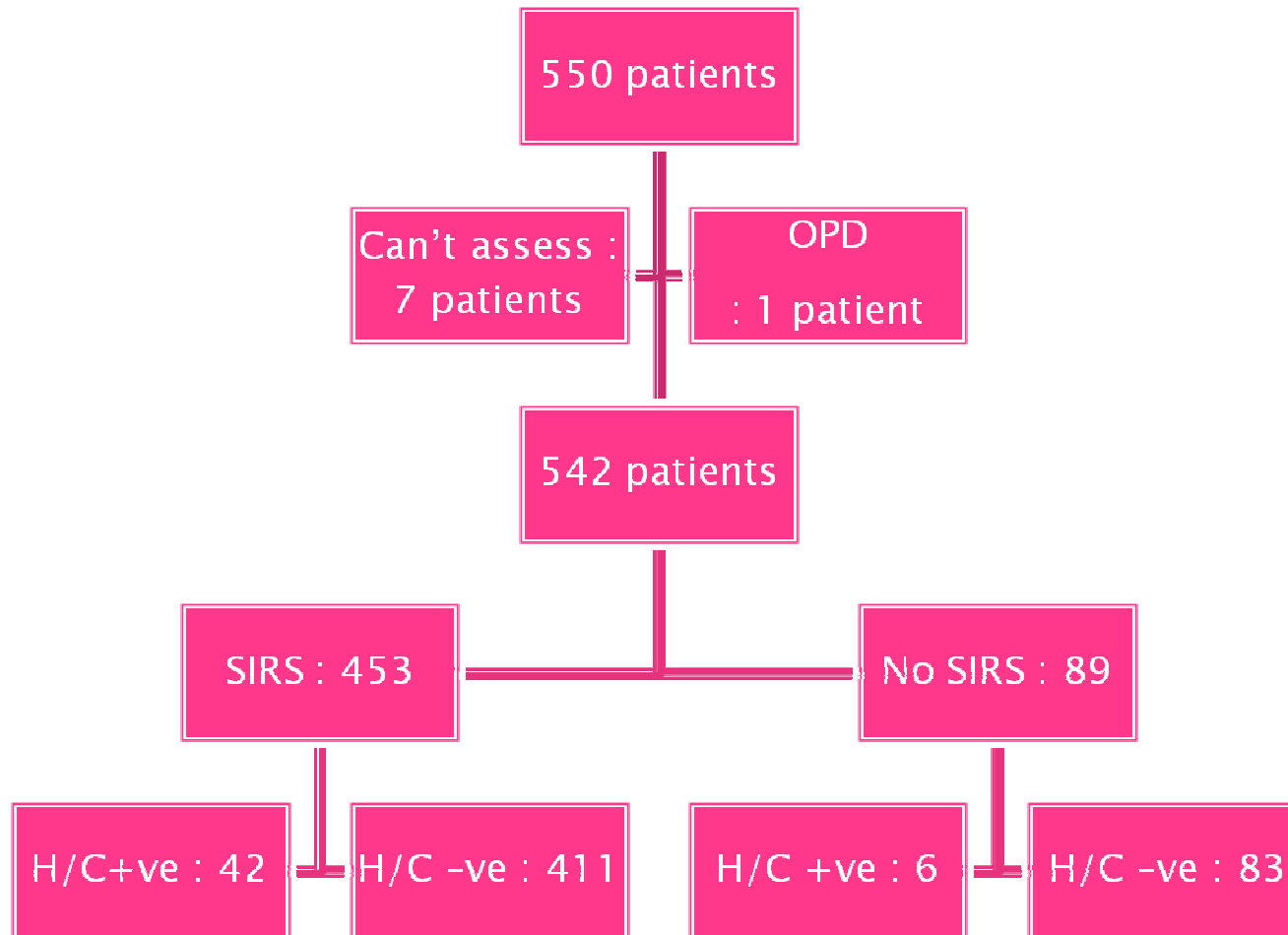
- ▶ There is retrospective and descriptive study.
- ▶ Chart and Electronic Data base review of patient, admitted at Soidao Hospital, with obtain Hemoculture and documented from October 1, 2007 to September 30, 2008 was done



- ▶ Review 550 charts
- ▶ Can't access history 7 patient
- ▶ OPD case 1 case was excluded
- ▶ 542 pt were enrolled to our review

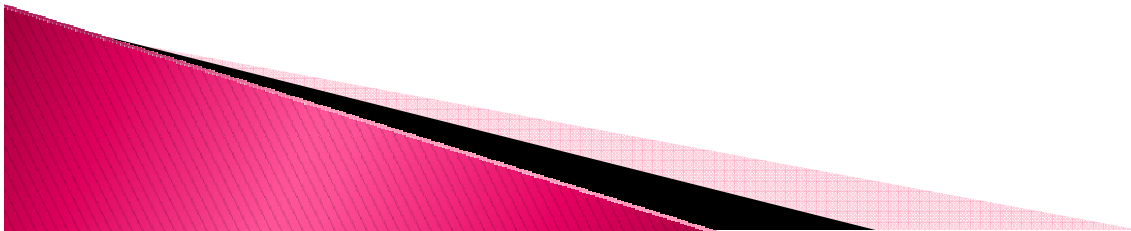


# Materials & Methods



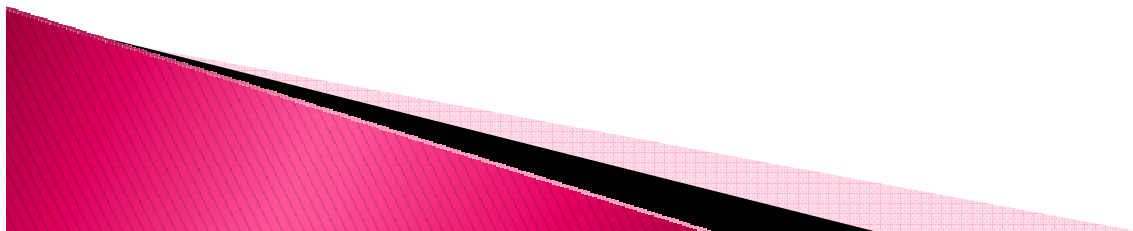
# Results & Discussions

- ▶ 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  
42
- ▶ Hemoculture negative  
411
  
- ▶ Percentage of hemoculture positive      9.27%



# Results : no SIRS group

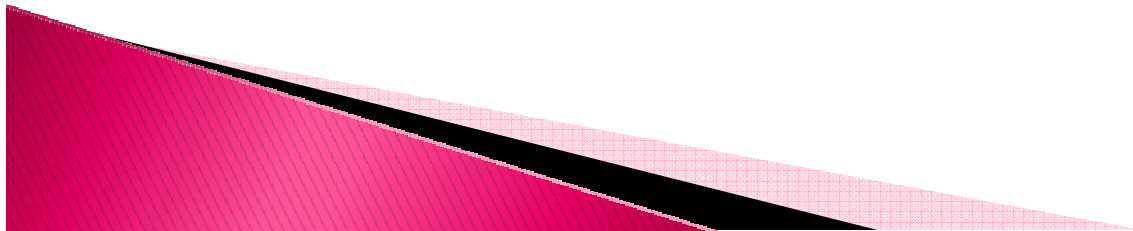
- ▶ Hemoculture positive

6

- ▶ Hemoculture negative

83

- ▶ Percentage of hemoculture positive 6.74%





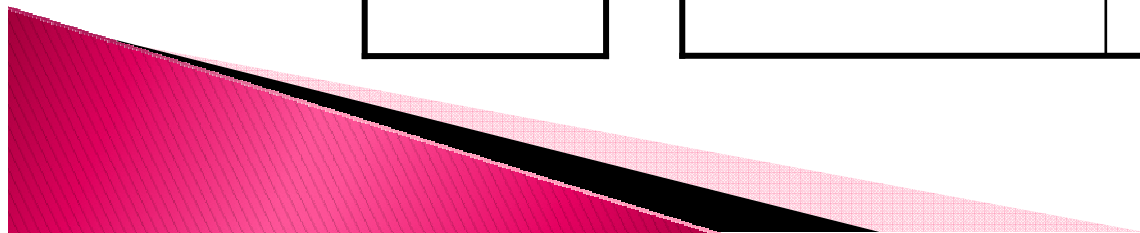
# Hemoculture “POSITIVE”

SIRS group	No SIRS group
Acute pyelonephritis[12]	Acute diarrhea[1]
Pneumonia[9]	Cholangitis[1]
Sepsis[8]	Cryptomenigitis
Acute diarrhea[4]	IE[1],Sepsis[1]
Others[9]	Complicated UTI[1]

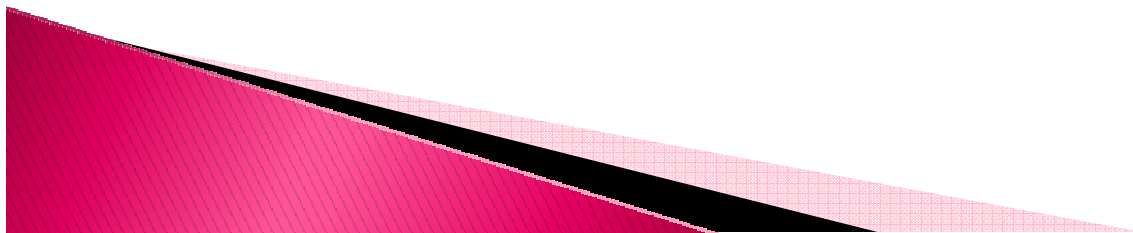
# Hemoculture “NEGATIVE”

SIRS group	No SIRS group
Pneumonia[80]	Abscess-cellulitis[24]
Urinary Tract Infection[42]	Pneumonia [11]
Sepsis[37]	Urinary Tract Infection[9]
Acute diarrhea[17]	Sepsis[3]
Tropical disease[14]	Bronchitis[2]

	H/C pos	H/C neg
SIRS	42	411
NO SIRS	6	83

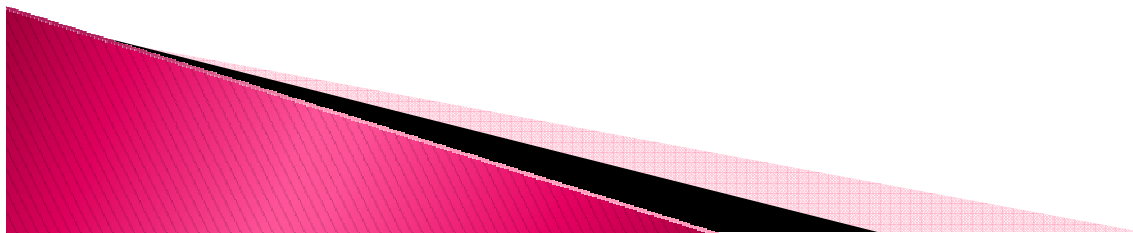


- ▶ From the results, Soidow hospital obtain 550 specimens and positive in 48 specimens
- ▶ That was 8.72%
- ▶ The low yield of blood cultures has significant financial costs,wastes time,and results in **unnecessary** needle sticks for patient and risk for health care workers?

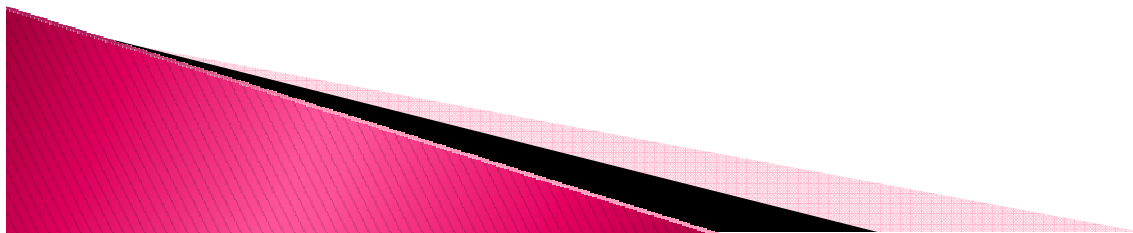


▶ The general Indicator for blood culture use are poorly defined, and as a result, overall blood culture yields from hospitalized patients remain remarkably low at 4–8%<sup>[1,2,3,4,5]</sup>

- Bates DW, Cook EF, Goldman L, et al. predicting bacteremia in hospitalized patients . A prospectively validated model .Ann Intern Med 1990;113:495–500
- Pfitzenmeyer P, Decrey H, Auckenthaler R, et al predicting bacteremia in older patient. J Am Geriatr Soc 1995;43:230–5

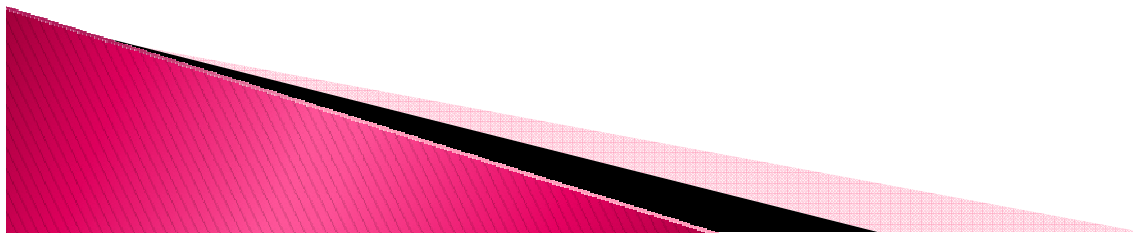


- ▶ Nonetheless, the identification of patient at risk for bacteremia is **critical**.
- ▶ Untreated bacteremia may lead to the development of sepsis syndrome and septic shock, with **mortality rates estimate at 30-50%**

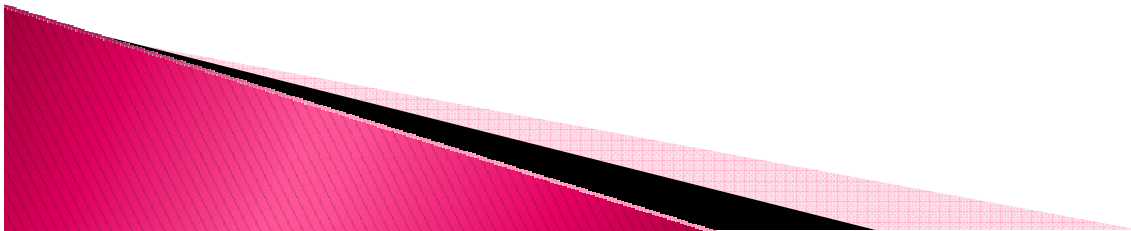


# Hemoculture negative???

- ▶ In many cases, blood cultures are negative; this result can reflect...
  - prior antibiotic administration
  - the presence of slow-growing or fastidious organisms
  - the absence of microbial invasion of the bloodstream.
- ▶ Gram's staining and culture of material from **the primary site of infection or of infected cutaneous lesions** may help establish the microbial etiology



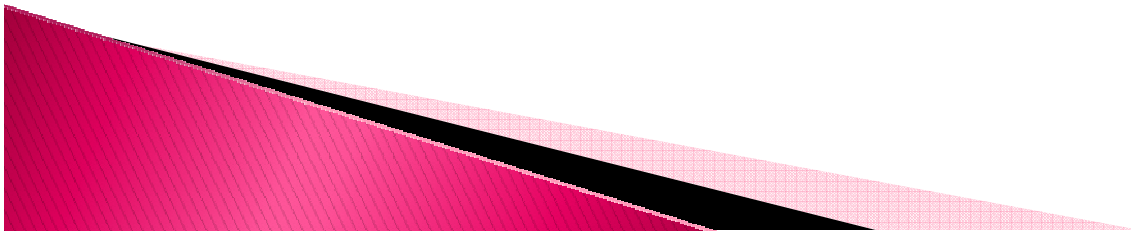
- ▶ As results from our review, we can't conclude that SIRS is the definite clinical decision rule to obtain hemoculture .





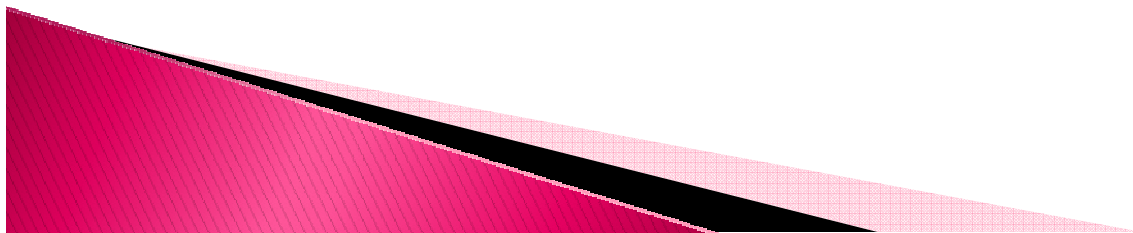
# suggestions

- ▶ Although many criteria were created to identify evidence of sepsis , the most important thing in general practices is clinical judgement and clinical experiences .



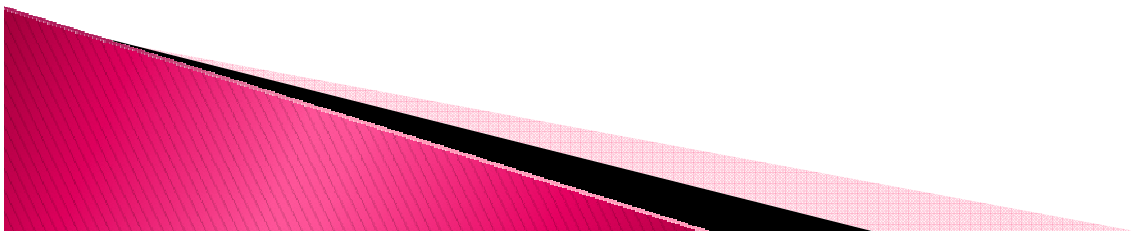
# Limitations

- ▶ Our review has several limitations to consider
  - Some of electronic database about knowledge was restricted for only registrator , so we can't assess them .
  - Some data can't be extracted from electronic databases .



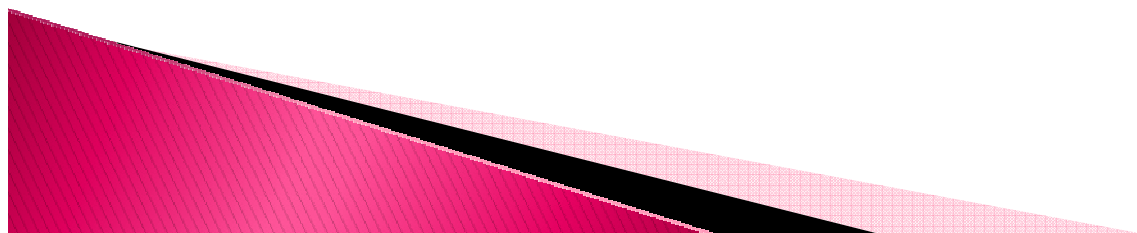
# Chart review 20 patients

- ▶ 2 no sensitivity for antibiotics
- ▶ 3 contaminate?
- ▶ 4 pneumonia
- ▶ 3 UTI
- ▶ 1 Refer
- ▶ 10 others



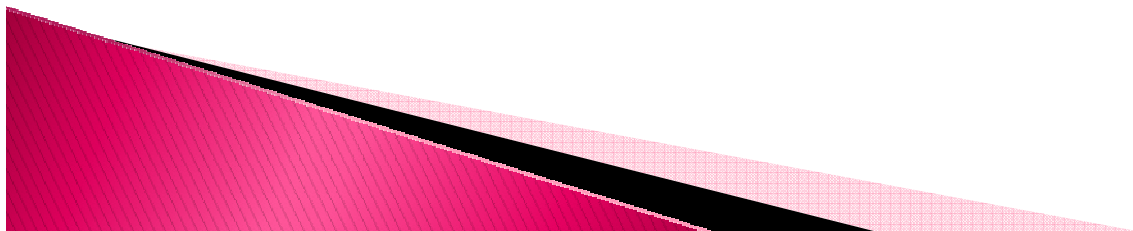
# Acknowledgement

- ▶ นพ.ธวัช คงคาลัย ผู้อำนวยการโรงพยาบาลสอยดาว
- ▶ พญ.อุไร ภูนวกุล อาจารย์ที่ปรึกษา
- ▶ น.พ. ชัชวาลย์ โภโค
- ▶ น.พ. วุฒิพงศ์ สรรพสิทธิ์วงศ์
- ▶ นพ.ณัฐวุฒิ ตัณฑเทิดธรรม
- ▶ คุณ อุดมศักดิ์ ชัยยะ เจ้าหน้าที่ศูนย์คอมพิวเตอร์
- ▶ คุณทิวากร แสงอุไร เจ้าหน้าที่ถ่ายเอกสาร



# References

1. Bates DW, Cook EF, Goldman L, et al. predicting bacteremia in hospitalized patients . A prospectively validated model .  
Ann Intern Med 1990;113:495-500
2. Mellors JW , Horwitz RI , Harvey MR , et al . A simple index to identify occult bacteria infection in adults with acute unexplained fever .Arch Intern Med 1987;147:666-71
3. Pfitzenmeyer P, Decrey H, Auckenthaler R, et al predicting bacteremia in older patient.J Am Geriatr Soc 1995;43:230-5



4. Aronson MD, Bor D, blood cultures.  
Ann Intern Med 1987;106:246-53
5. Fontanarosa PB, Kaeberlein FJ, Gerson LW, et al. Difficulty in predicting bacteremia in elderly emergency patients. Ann Emerg Med 1992;21:842-8
6. The 17th Edition of Harrison's Principles of Internal Medicine.

