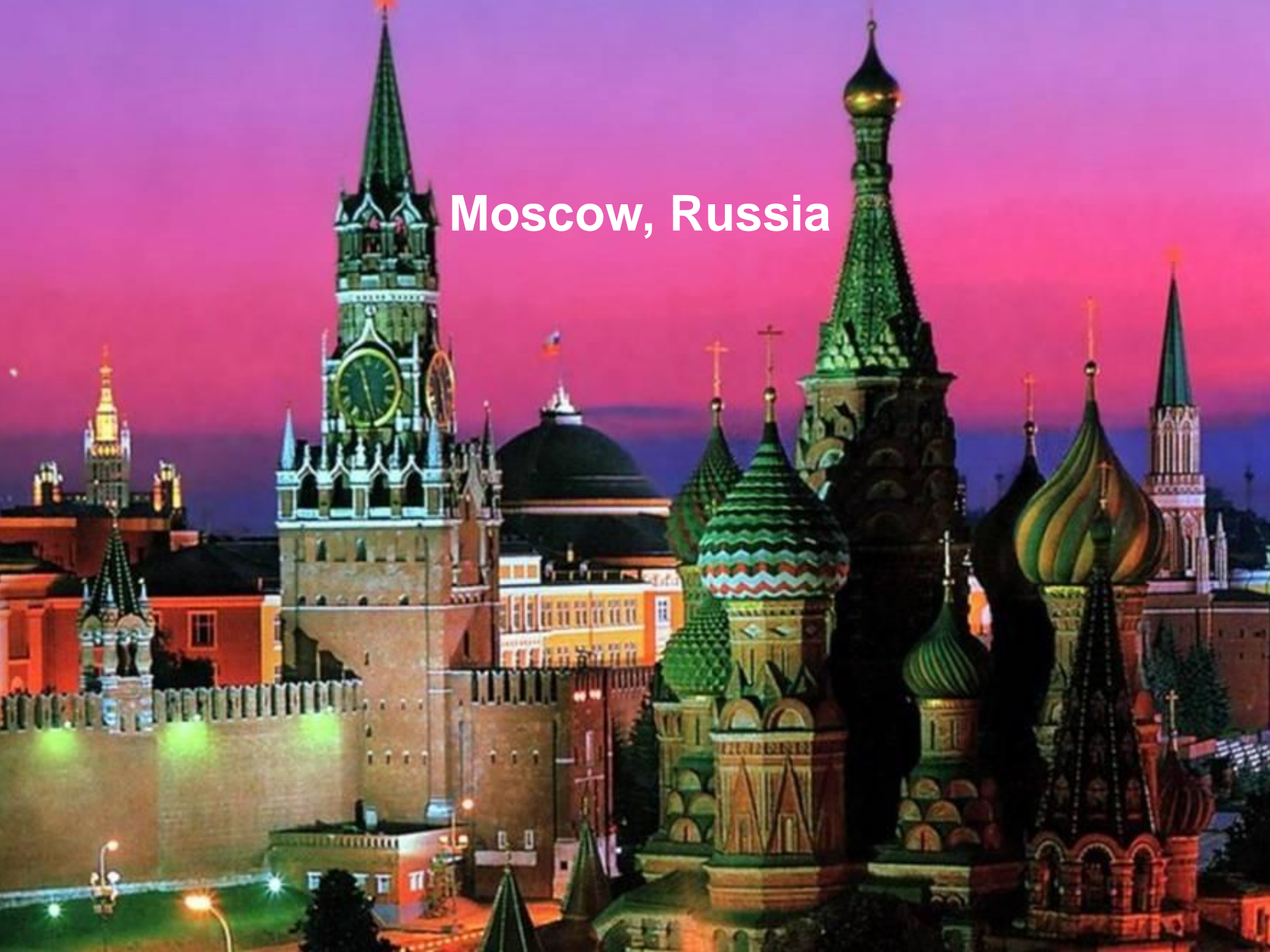


Moscow, Russia





Clinical significance of presepsin in infectious complications of surgical patients and patients with burn injury

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Currently, early and accurate diagnosis of sepsis remains to be a very important problem in clinical and laboratory practice. There are many laboratory markers for the diagnosis of this condition. However, such markers as procalcitonin (PCT) and C - reactive protein (CRP) are traditionally the most widely used.

Recently, special attention is paid to the study of presepsin (P-SEP), which is positioned as a new earliest and specific biomarker of sepsis.

In spite of numerous publications on high specificity and sensitivity of the above mentioned laboratory tests in sepsis, there is no consensus on this issue among clinicians.

Aim of the Study

Identification of the clinical significance of P-SEP, CRP and PCT in surgical patients with infectious complications and severely burned patients, depending on the severity of injury, status of the patient and the outcome.

Materials and methods

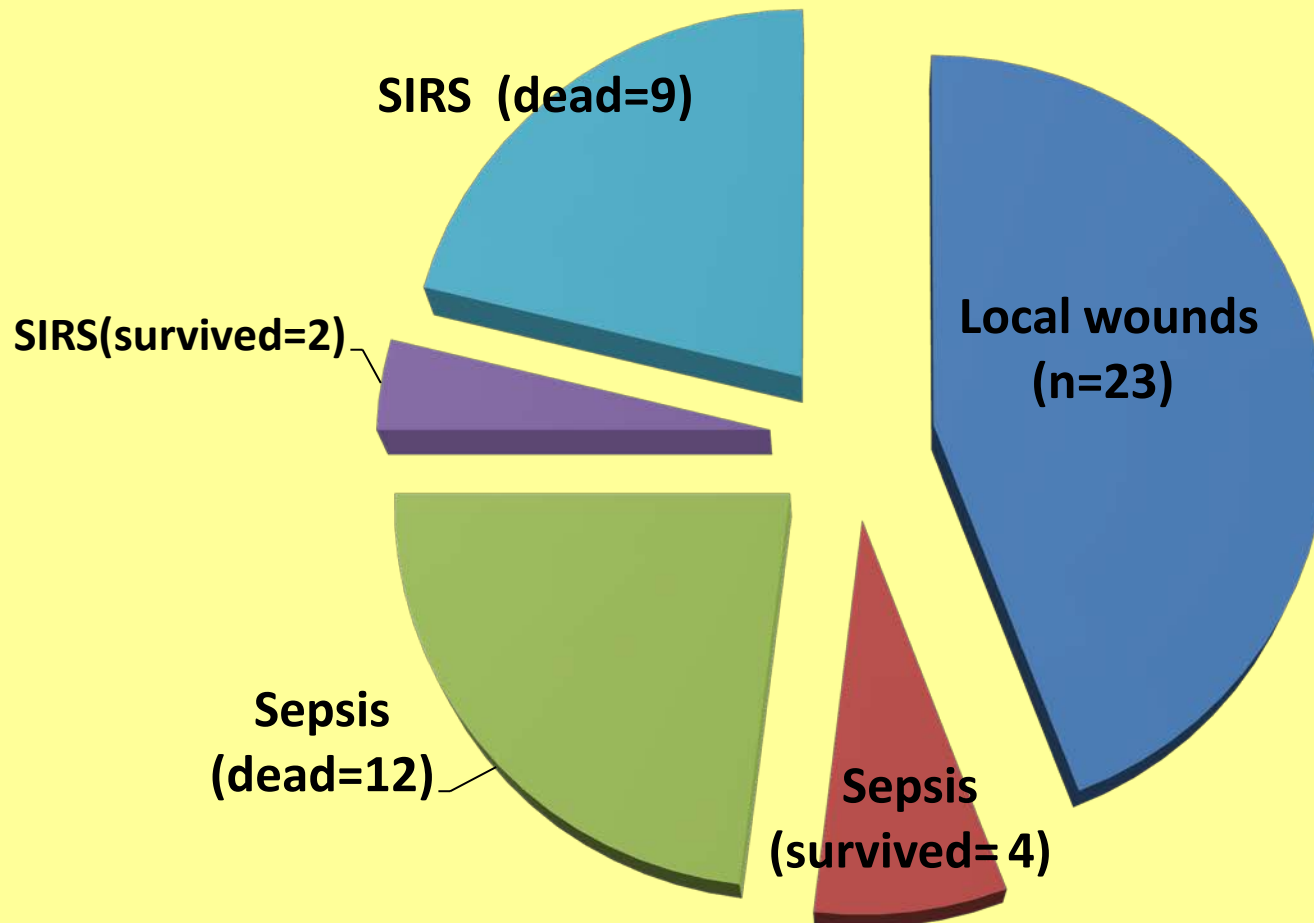
- **16 healthy volunteers**
- **50 patients with infectious complications after surgery were examined in dynamics.**

The types of complications:

- * **sepsis (n=16);**
- * **systemic inflammatory response (SIRS) with decompensation of concomitant diseases (n=11);**
- * **local wound (n=23)**

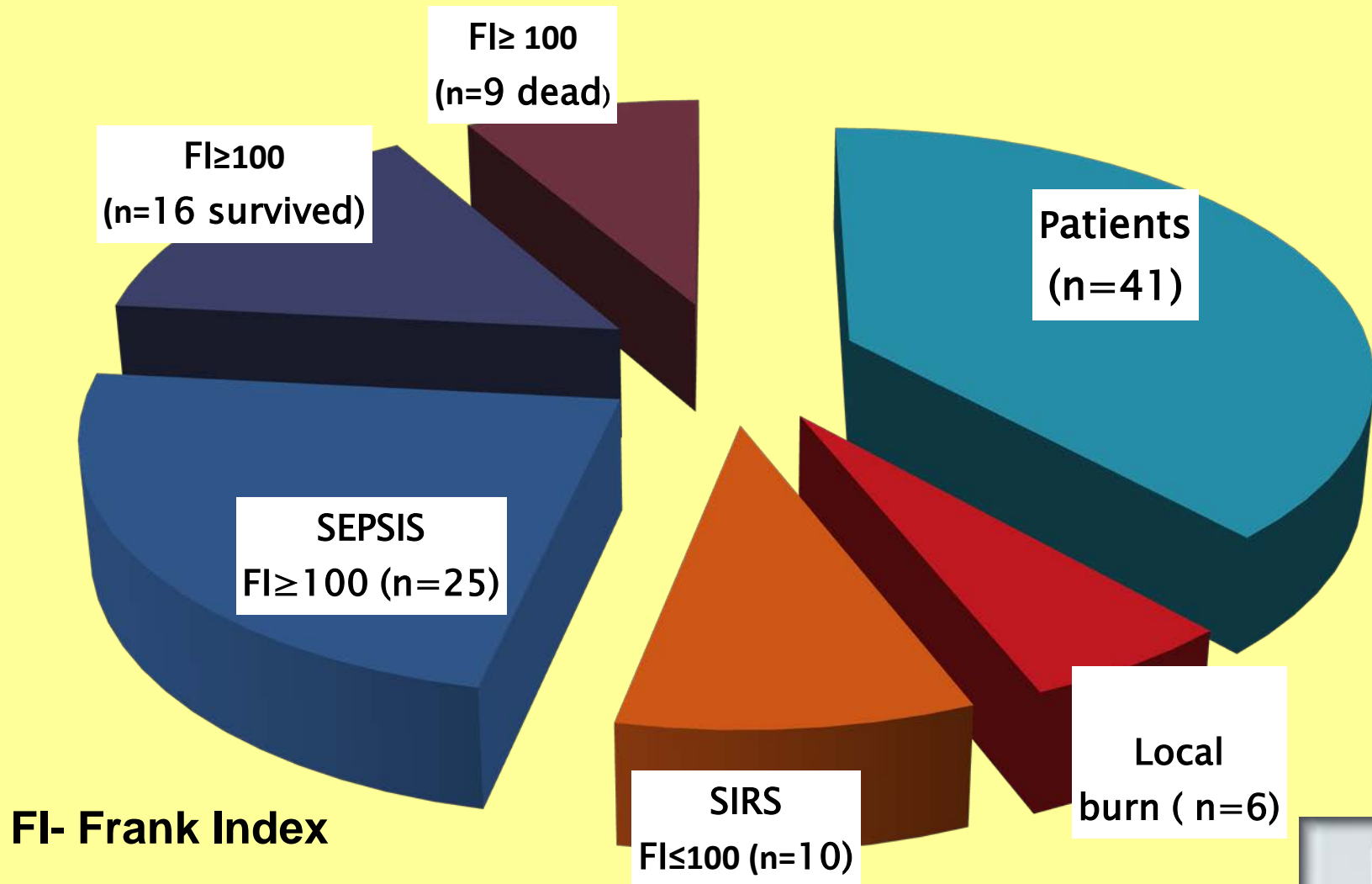
Materials and methods

Structure of the examined patients with surgical infection (n=50)



Materials and methods

Structure of patients with burn injury



- **The Frank Index is the sum of the areas of superficial and deep burns, expressed in conventional units. 1% of the superficial burn areas is equal to 1 unit, while 1% of the deep burn is equal to 3 units.**

Laboratory Express mode tests:

- P-SEP - quantitative determination by immunochemiluminescent method
(PATHFAST, Japan)



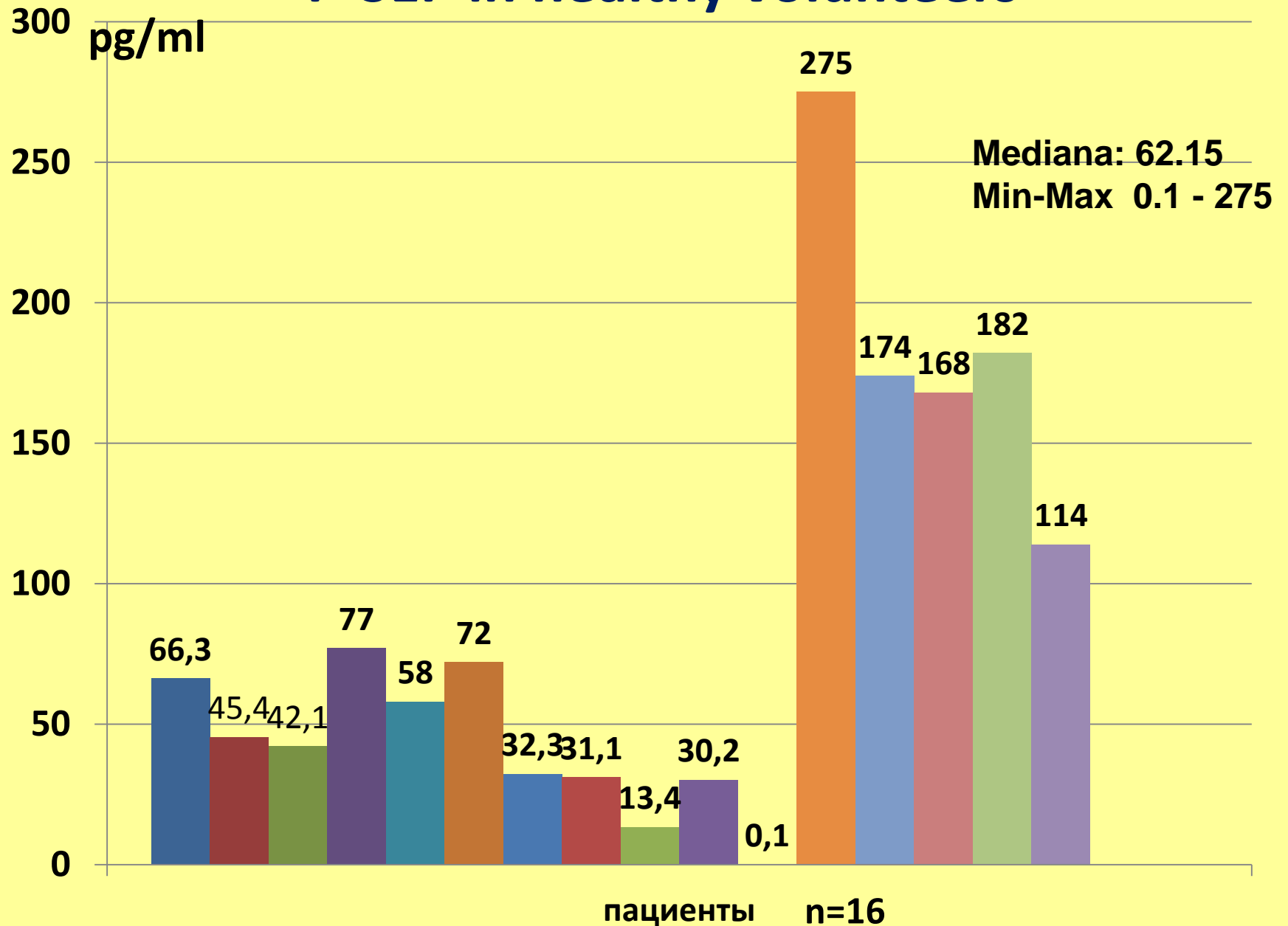
- CRP - quantitative determination: immunochemiluminescent method
(AQT-90, Denmark)



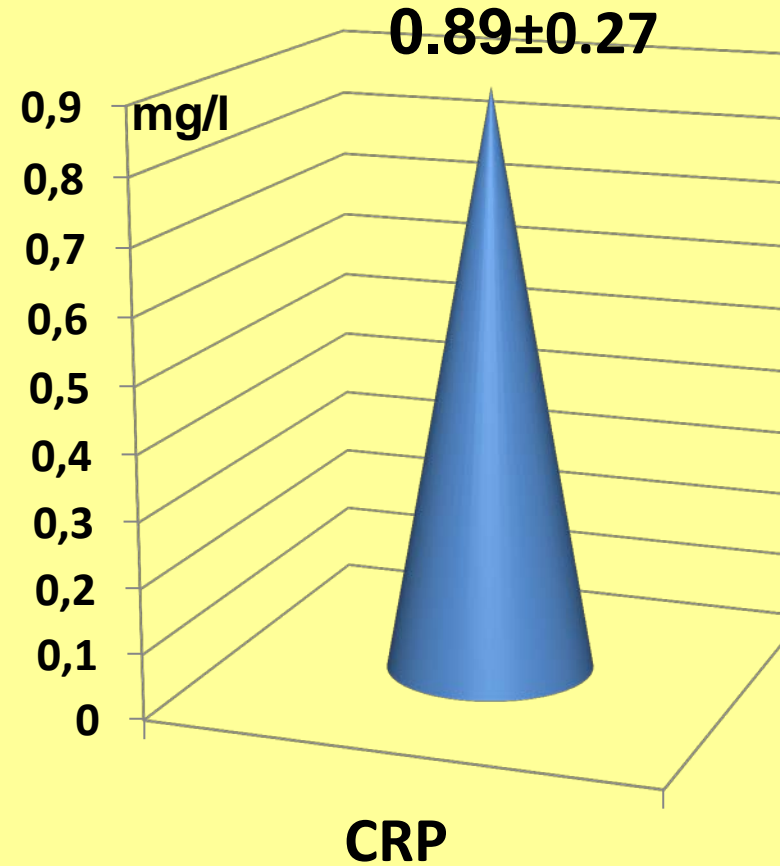
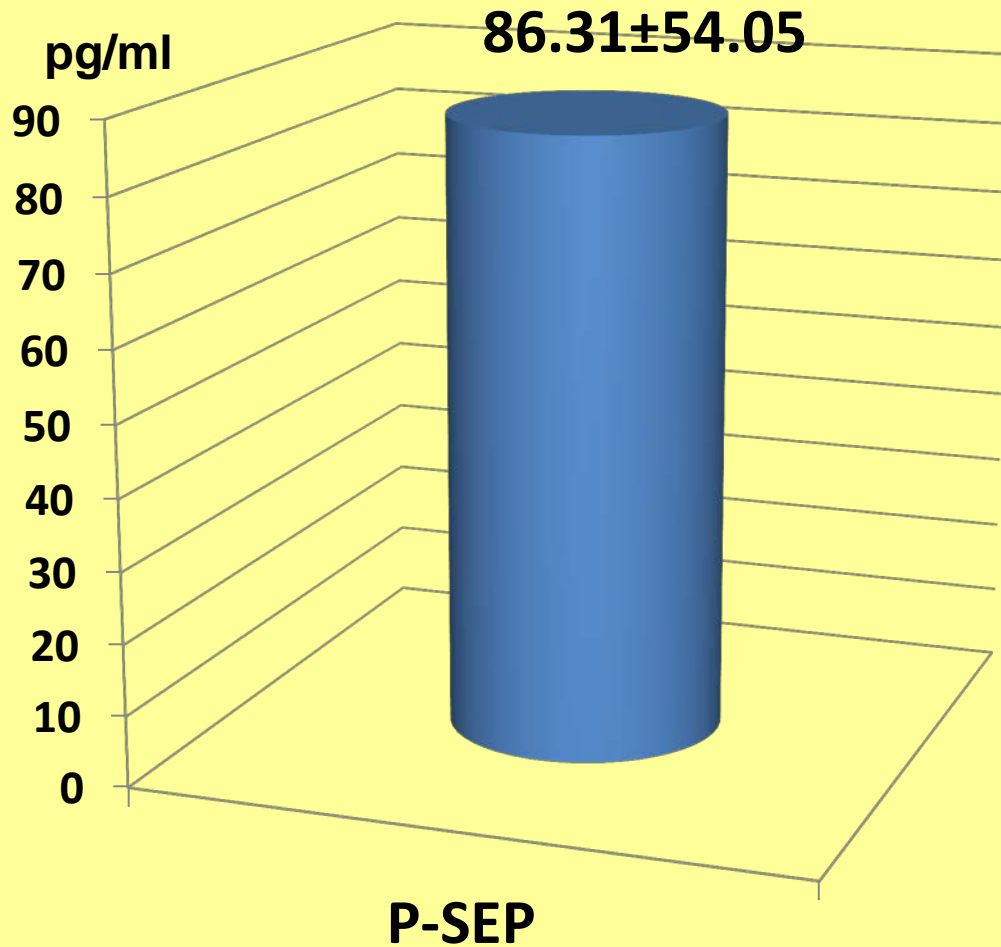
- PCT - semiquantitative measurement of lateral flow by immunochromatographic method
(BRAHMS PCT - Q, Germany)



P-SEP in healthy volunteers



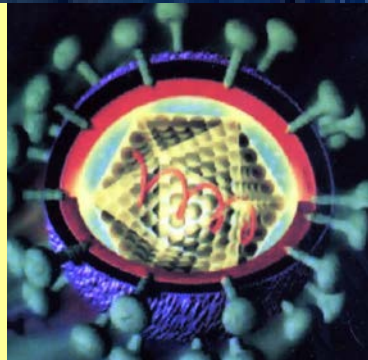
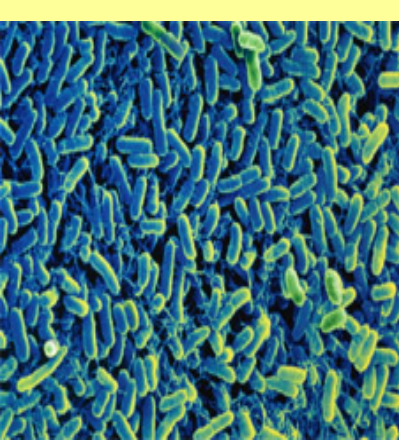
Mean level of the markers ($M \pm m$) in the healthy volunteers (PCT < 0.5 ng/ml)



Reference meanings: < 337 pg/ml

< 5 mg/l

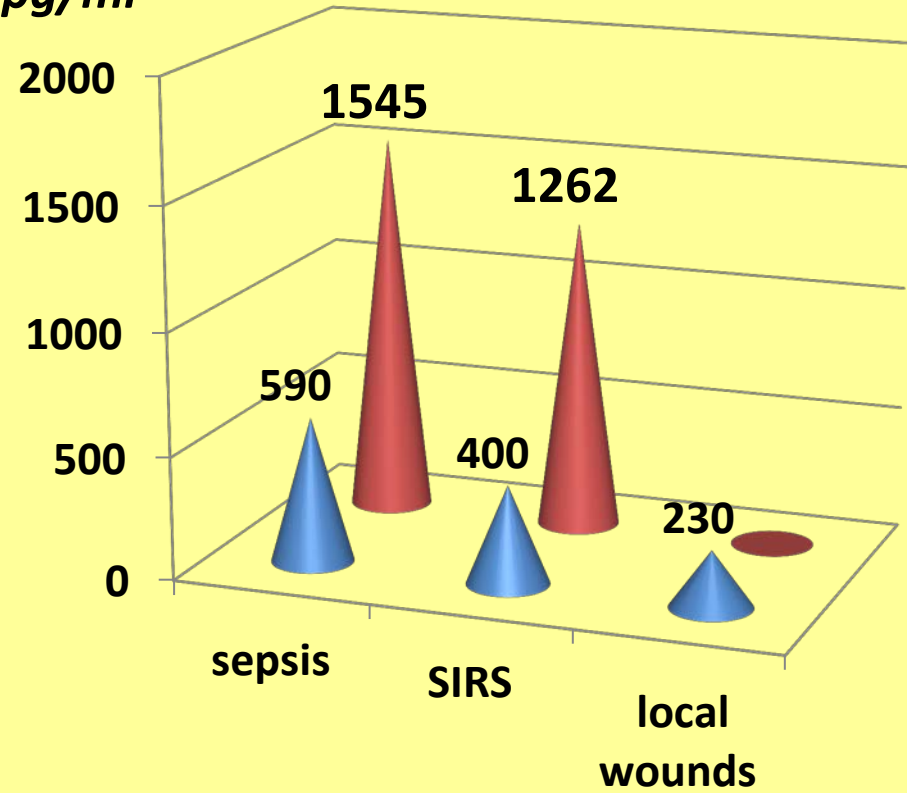
SURGICAL INFECTION



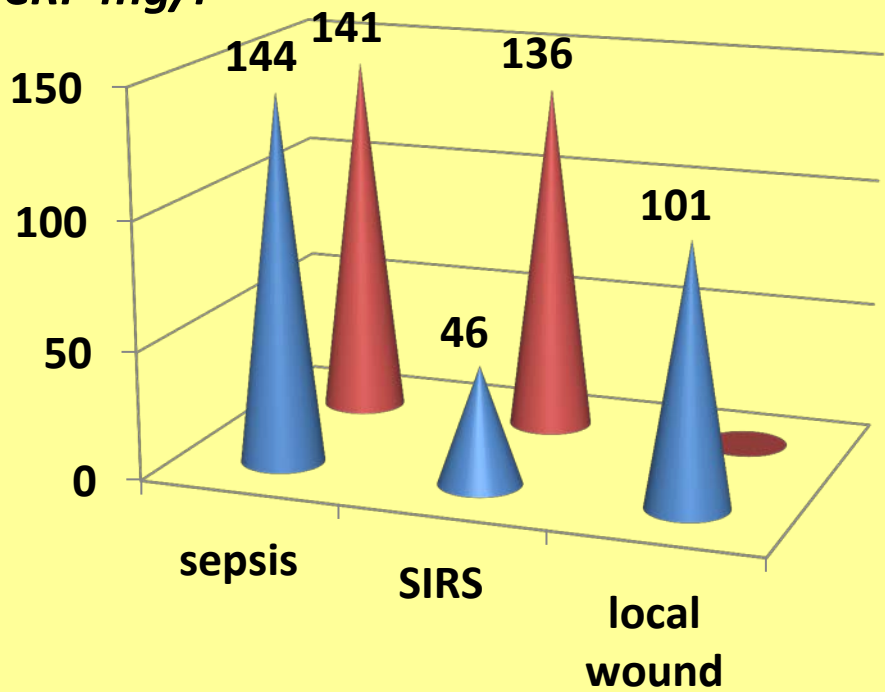
Mean level of the markers in the surgical patients on admission to the Intensive Care Unit

(PCT 0.5 - 2.0 ng/ml)

P-SEP
pg/ml



CRP mg/l

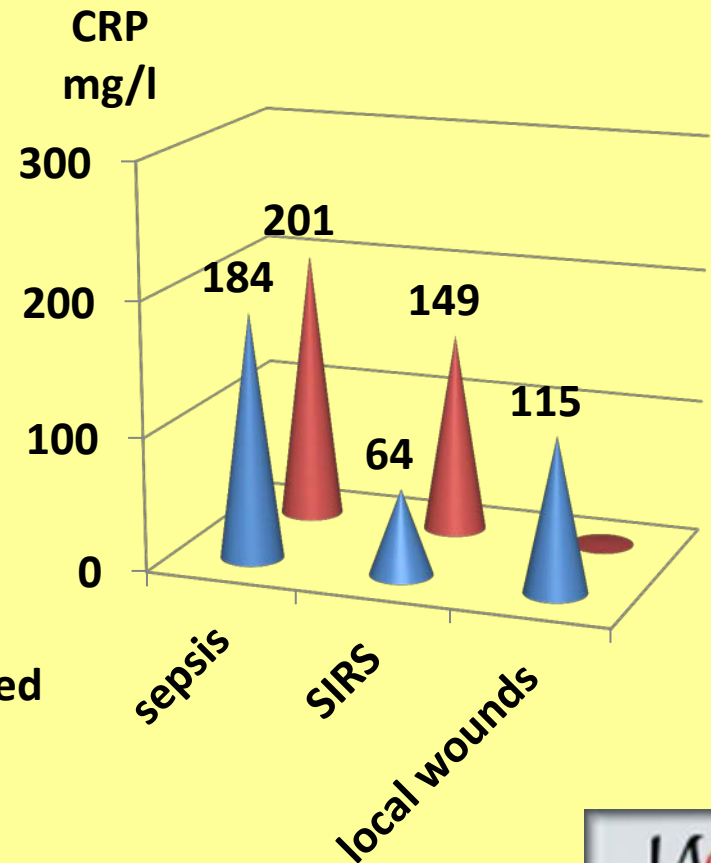
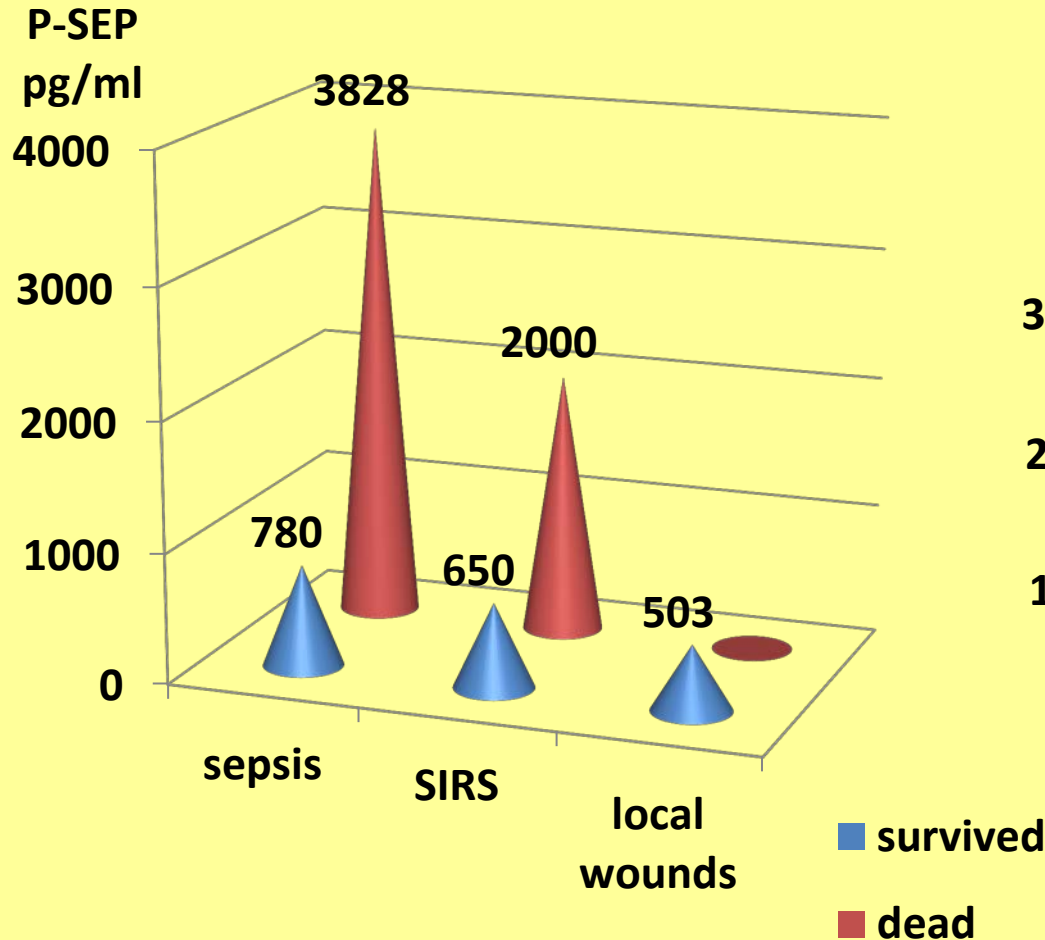


■ survived
■ dead

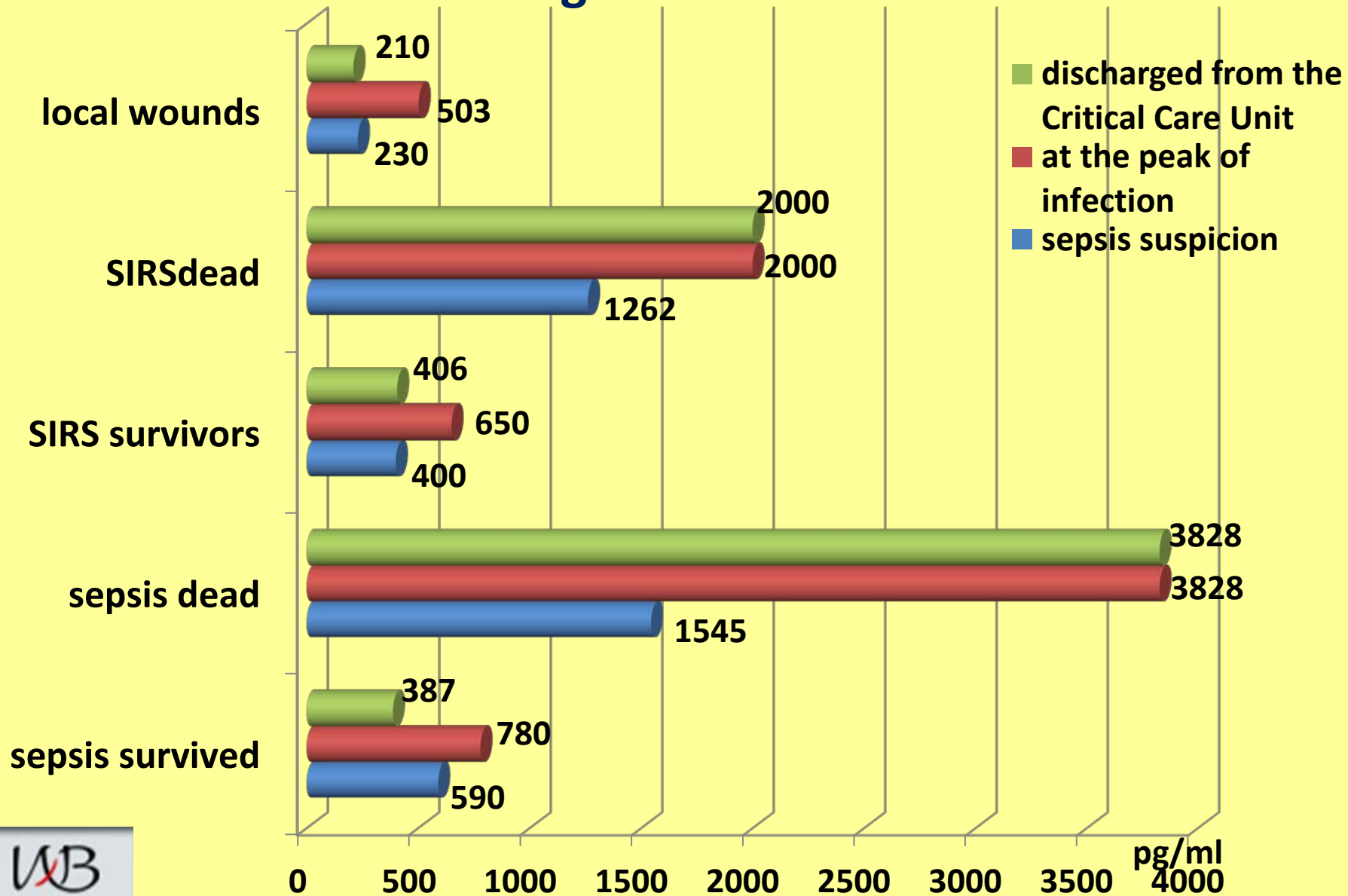


Mean level of the markers in the surgical patients at the peak of infectious complication

(PCT ≥ 0.5 ; ≥ 2 : with episodic increasing up to ≥ 10 ng/ml)



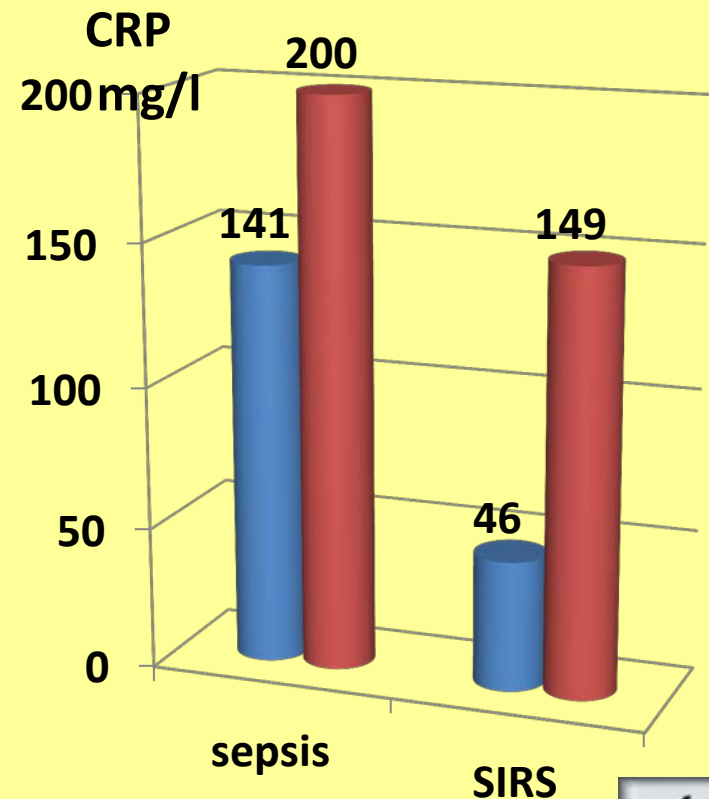
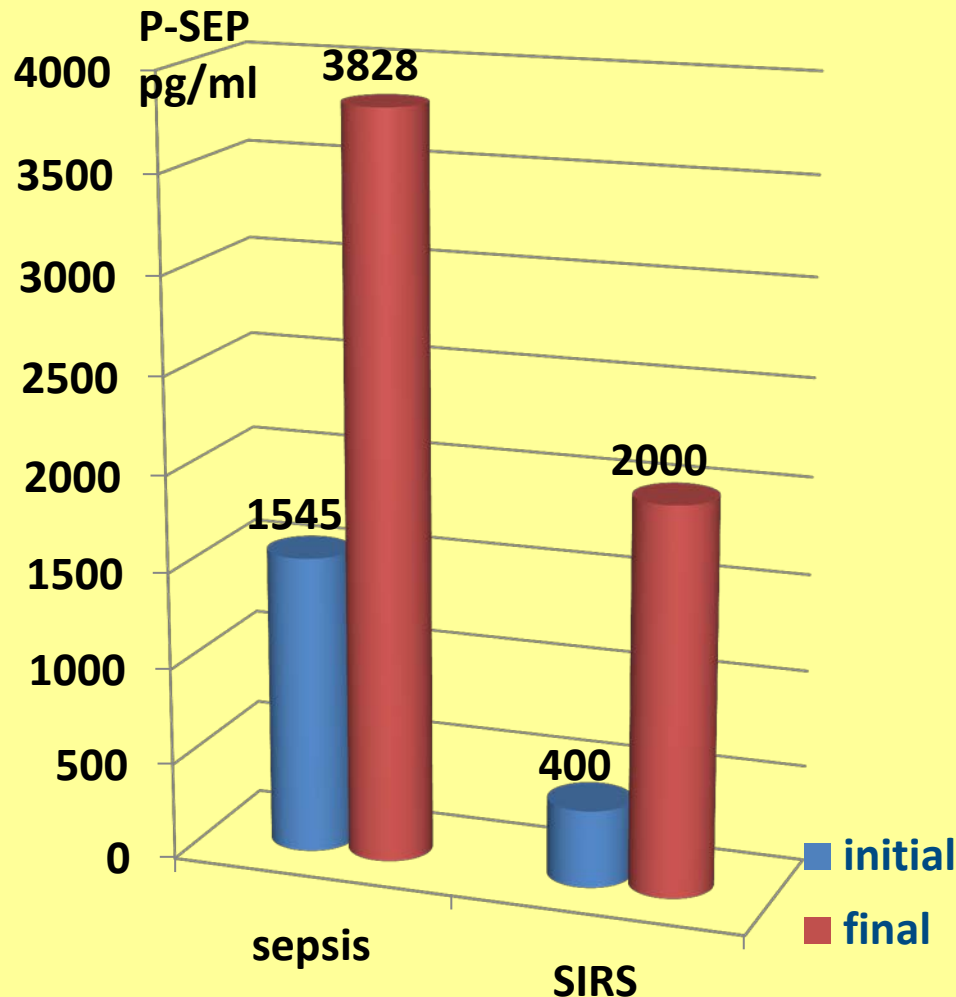
Comparative values of P-SEP dynamics in the patients with surgical infection



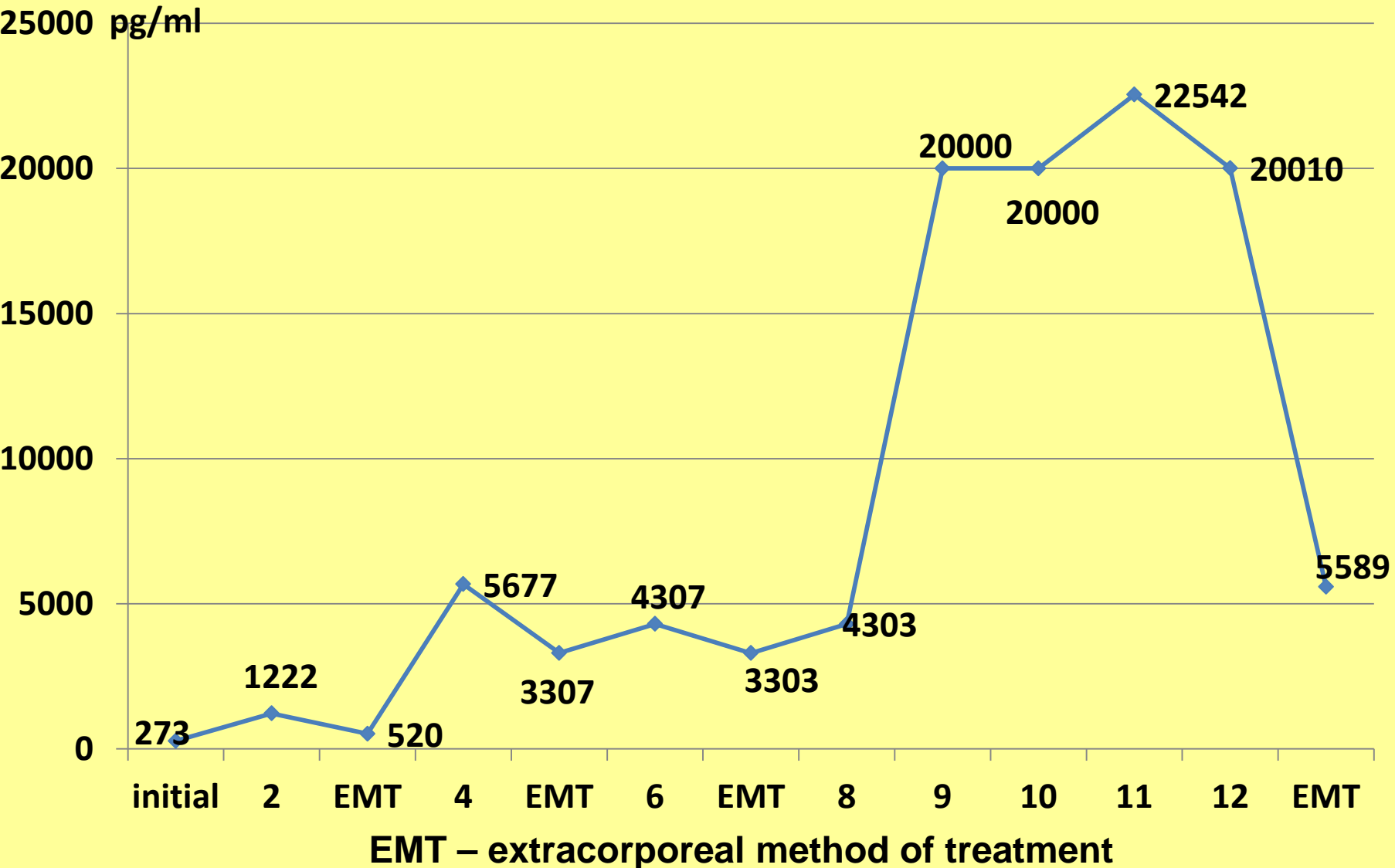
Comparison of the **initial** and **final** levels of the markers in the dead patients with surgical infection

(PCT from 0.5 to 2.0 ng/ml)

(PCT ≥ 0.5 ; ≥ 2 ; episodes up to ≥ 10 ng/ml)



Dynamics of P-SEP in the blood of the patient with sepsis and ascending colon Cr during the treatment



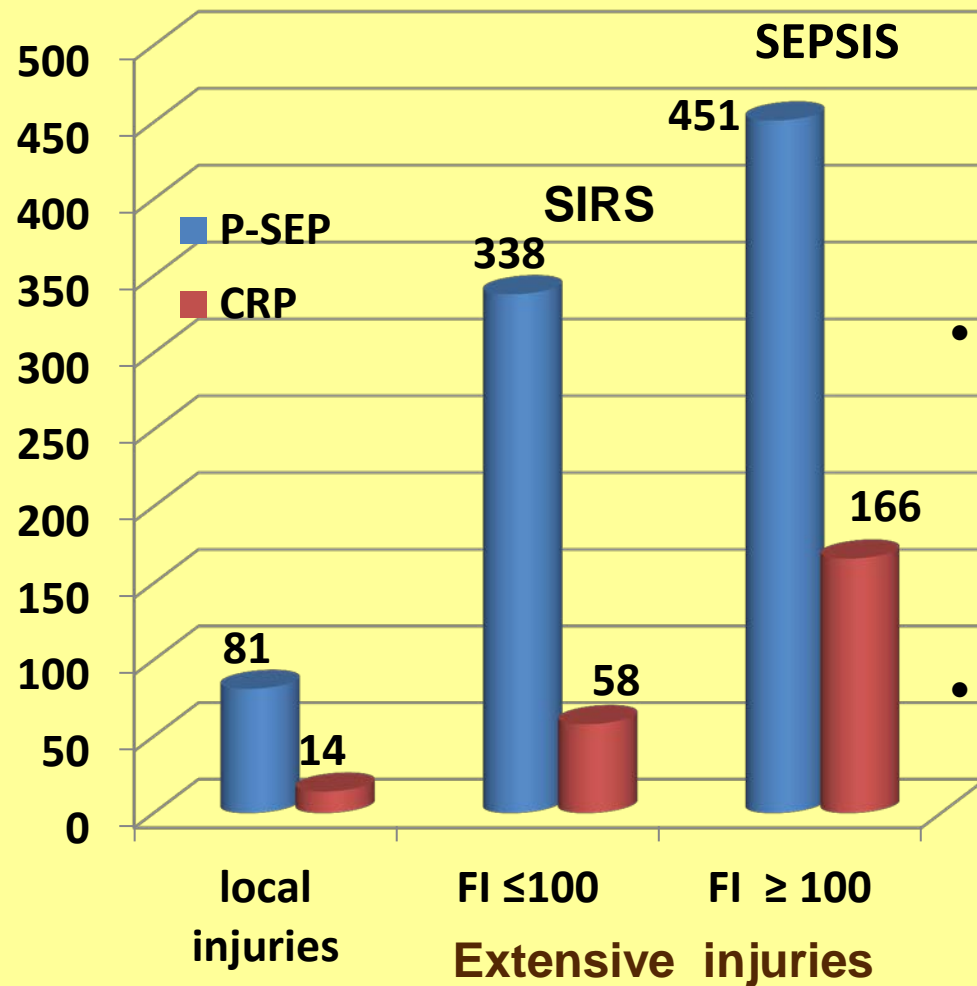
Dynamics of the inflammation markers in the patient with sepsis and ascending colon Cr

Stages of treatment	P-SEP pg/ml	CRP mg/l	PCT ng/ml
initial	273	46	≥2
Suspicion on sepsis	1222	46	≥2
after EMT	520	42	≥0.5
	5677	95	≥0.5
after EMT	3307	72	≤0.5
	4307	48	≤0.5
	20 000	72	=2
	20 000	81	≥2
	22542	87	≥10
after EMT	5589	26	=0.5

BURN INJURY



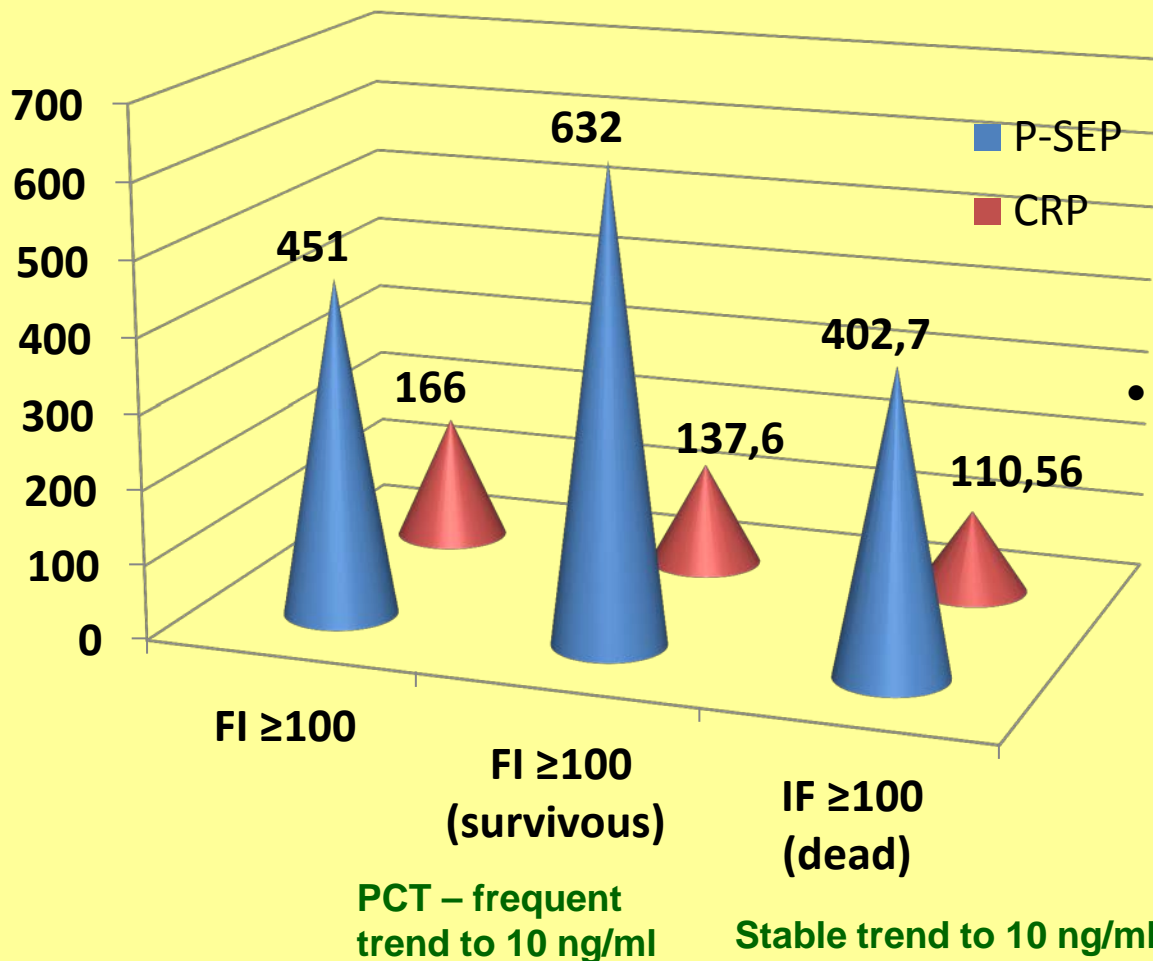
Values of the markers depending on the severity of burn injuries at admission to the Clinic



- In the patients of the first group with local injuries, despite the locality of the lesion, increased CRP was revealed: 13.68 mg/l compared to the normal values P-SEP: 81 pg/ml and PCT (<0.5 ng/ml).
- Victims with FI<100 had a systemic inflammatory response to extensive injury which is reflected in the increase in CRP(57.69 mg/l), P-SEP (338 pg/ml) and PCT ≥0.5 ng/ml with episodic increases up to 2 ng/ml.
- The most severe septic patients with FI>100 had significant differences in the level of inflammatory response to the injury. Namely, an increase of CRP: 166 mg/l, P-SEP: 451.15 pg/ml and PCT with periodic increases up to 2-10 ng/ml were revealed.

PCT <0.5 ng/ml: ≥0.5 ≤ 2; 2 – 10

Initial values of the markers in the blood of patients with severe burn injury (sepsis)

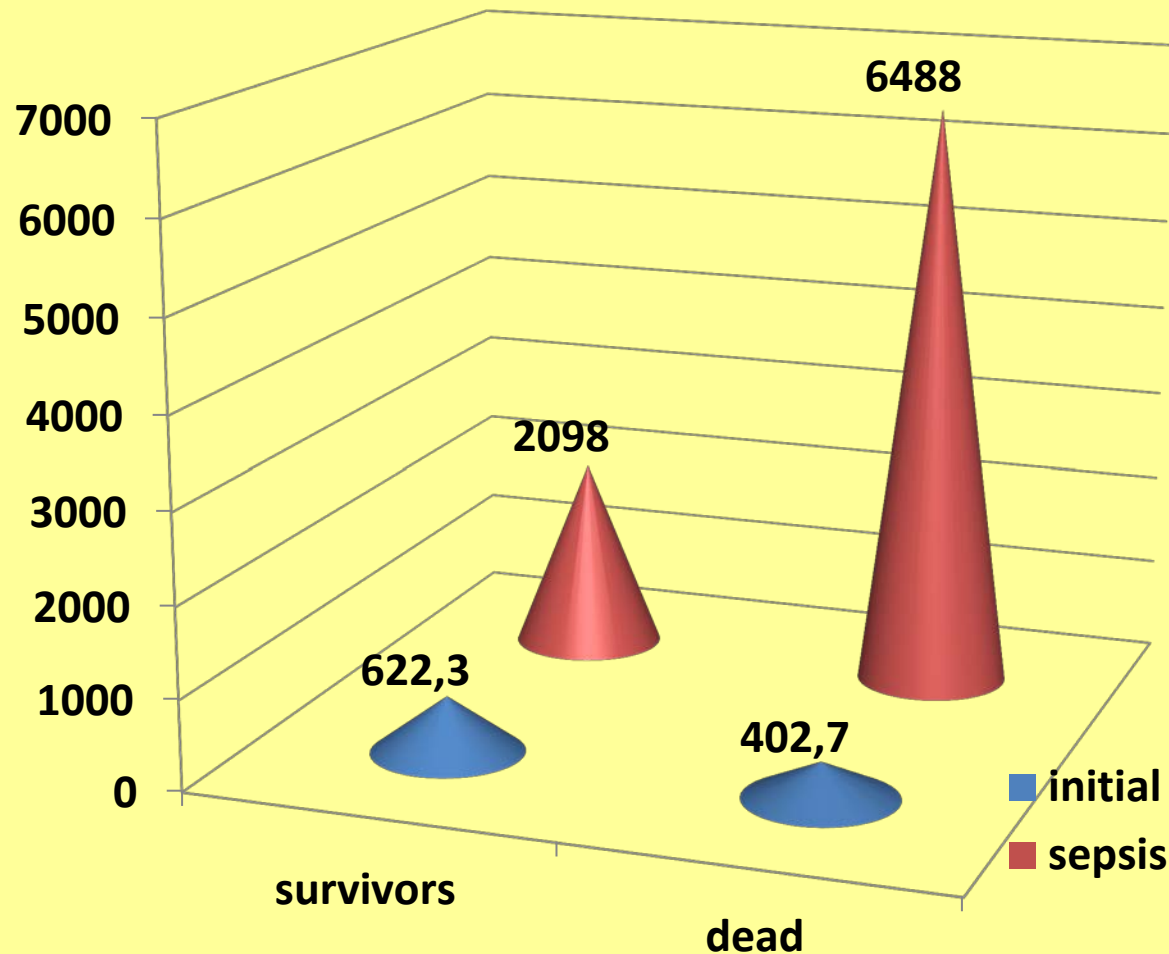


- The diagram on the left illustrates the mean values of the markers of all the patients, without dividing them into the survivors and the dead - P-SEP: 632.3 pg/ml, CRP - 137.6 mg/l, PCT (frequent trend to 10 ng/ml).

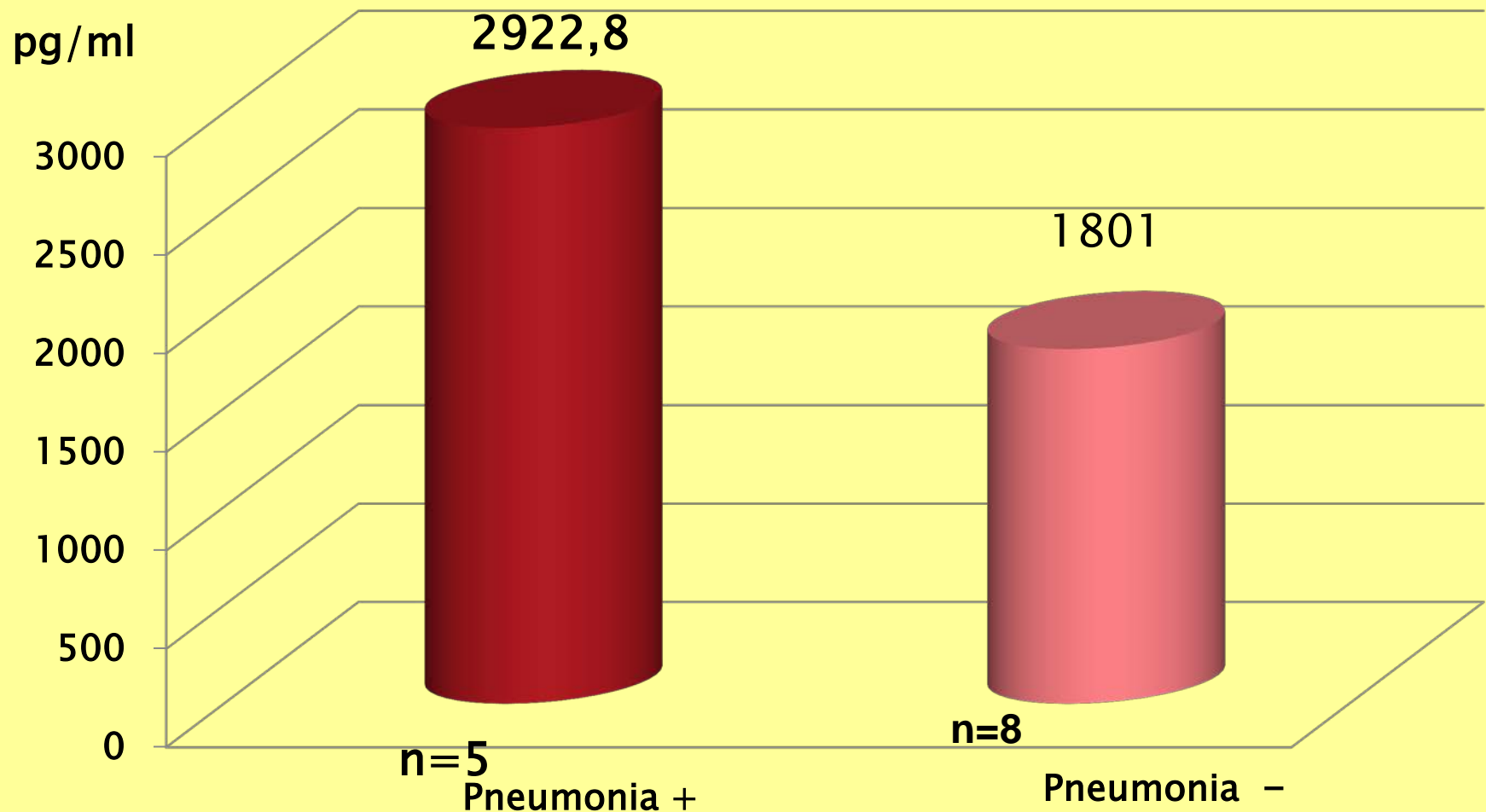
- The other 2 diagrams show the results for the survivors and the dead, given separately. In the septic patients who died later, the initial values of the markers were lower than in the survivors P-SEP: 402.7 pg/ml, CRP: 110.56 mg/l PCT stable trend to 10 ng/ml.

Monitoring of P-SEP values in the blood of patients with severe burn injury ($FI > 100$) and sepsis

pg/ml



In the blood of the survived patients with pneumonia, P-SEP reached higher values as compared with patients without pneumonia



CONCLUSIONS

1.

Complex diagnostics of patients in definite critical conditions by monitoring several inflammatory markers allows :

- to evaluate the adaptation of the inflammatory response to the severity of the condition and
 - to predict the generalization of infection.

It is noteworthy that P-SEP and CRP are more reliable markers of the inflammation development than PCT.

CONCLUSIONS

2.

In surgical patients with infectious complications P-SEP is the most informative laboratory indicator, which enables early diagnosis of sepsis, monitoring its severity and prediction of unfavorable outcomes

CONCLUSIONS

3.

- In patients with burn injury the initial presepsin level correlates with injury severity.
- The monitoring of the presepsin level allows to evaluate the risk of development of infectious complications (pneumonia, sepsis) in severely burned patients



THANK YOU FOR YOUR ATTENTION !

