- General
- A major and common question in clinical practice in the ICU is to differentiate between noninfectious systemic inflammation (such as SIRS) and sepsis.
- Most of these potential laboratory markers are elements (and mediators) of the host inflammatory response to infection.
- The most frequently reported as potential markers include C-reactive protein (CRP), procalcitonin (PCT), interleukin (IL)-6, IL-8, and other cytokines, as well as diverse immunologic and endothelial molecules.

- Normal range
- Acute phase responses come from changes in liver gene expression occurring after an inflammatory stimulus (injury, trauma, infection).
  - CRP is a positive APP whose plasma concentration increases rapidly, up to 1000-fold from around 1mg/mL, during inflammatory disorders.
  - The median plasma concentration of CRP measured in healthy young adults is 0.8 mg/L.
  - The 90th and 99th percentiles reported from these studied samples were 3 mg/L and 10 mg/L, respectively.
  - Plasma CRP concentrations are determined only by the synthesis rate of CRP, and this rate increases markedly depending on the intensity of inflammatory stimuli.
  - When the stimulus is no longer present, CRP levels quickly fall.
  - The plasma half-life of CRP appears to be around 19 hours.
  - CRP expression and its induction in the hepatocyte is mainly regulated transcriptionally by IL-6 through activation of several transcription factors.

- function of CRP
- The biologic functions of CRP are protective:
  1. It exhibits both proinflammatory and anti-inflammatory activities.
  2. CRP has several calcium-dependent binding properties and biologic functions, related to nonspecific innate immune response.
- bacterial and fungal infections are potent inflammatory stimuli that induce a major acute phase response producing markedly elevated CRP levels.
- Some autoimmune diseases (arthritis and vasculitides), organ tissue necrosis, intense trauma, surgery, and various neoplasias, may also significantly increase the circulating levels of CRP.
- Minor acute phase responses with slightly elevated CRP levels may also occur in association with low-grade inflammatory states.
- CRP levels are associated with prognosis in acute myocardial infarction and in acute coronary syndromes.
- Recently, it has been demonstrated that there is an association between minor elevated plasma concentrations and the risk of developing cardiovascular disease that may represent a subclinical state of low-grade chronic inflammation, which may reflect vascular inflammation. It seems that CRP is not only an inflammatory marker and predictor of cardiovascular disease, but also a mediator of disease because it is involved in the pathogenesis of atherosclerosis and athrogenesis.

- causes of elevated CRP
- CRP was discovered in 1930 by studying patients with Streptococcus pneumoniae infection, and it was so named for its ability to bind to the somatic C-polysaccharide of such bacteria.
- Belongs to the family of pentraxins, which are calcium-dependent ligand-binding plasma proteins.
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