

The Acute Phase Response and C-reactive protein

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When and how to use CRP

Why to do any test?

- Diagnosis – to exclude or include a differential diagnosis
- Monitor – to monitor the patient's disease course or treatment
- Prognosis – to suggest what course the disease will take

A test should provide useful, independent, cost effective, information that is not available by any other means. A test should be able to help you answer a relevant question.

Reasons not to do a test

- Is the test abnormal
- A fishing expedition
- Someone else did it before
- The patients "demands" it
- It was abnormal before and I don't know why
- I have no idea what the matter is

Suitable questions for a CRP request

Question	Can CRP help?
Does my patient have an ongoing inflammatory process ongoing?	YES – a raised serum CRP is unequivocal evidence of an infectious or inflammatory process. Result must be interpreted with the history and examination. Also look at serum albumin – low albumin suggest sick patient!
Does my patient have a bacterial infection?	YES and NO – a raised serum CRP is unequivocal evidence of an infectious or inflammatory process but it cannot distinguish between the two. HOWEVER , the magnitude of the CRP broadly relates to the magnitude of the inflammation. Result must be interpreted with the history and examination. <ul style="list-style-type: none">• 10-40 mg/L in mild inflammation and some viral infections• 40 – 200 mg/L reflect acute inflammation and bacterial infection• >200 mg/L seen in extensive trauma and severe bacterial infections• 300-900 mg/L – ITU range!
My patient has RA, JCA, Ank Spond etc. – can I use the CRP to monitor disease activity?	YES – probably the most useful marker of disease activity. Result must be interpreted with the history and examination.
My patient had a chest infection but symptoms have remained despite antibiotics – will CRP be useful?	YES – CRP should halve every 24 hours if an otherwise well patients chest infection is treated with appropriate antibiotics. If the CRP remains high, then it is likely that the infection has not resolved.
Does my patient with SLE have an infection or a lupus flare?	YES – CRP does not typically increase with SLE but it will increase in SLE patients with infection.

Is CRP better than an ESR?

Result affected by	ESR – measure of the speed red cells fall through plasma. Influenced by red cell shape and size, plasma protein concentrations etc. ESR slow to increase in inflammation and very slow (months) to resolve.	CRP – protein produced by the liver under the control of cytokines IL6, IL1 and TNF. Rapid switch on of CRP production – detectable increases in severe inflammation within 12 hours of onset. Half life approx.. 12-24 hours so rapid normalisation of the marker if the inflammation has resolved.
Gender	Yes	No
Age	Yes	No
Pregnancy	Yes and unpredictably	No
Temperature	Yes	No
Drugs e.g. steroids, salicylate	Yes	No
Smoking	Yes	No
Plasma protein concentrations, albumin, Igs, fibrinogen	Yes	No
Red blood cells – haematocrit, morphology, aggregation	Yes	No
When is ESR better than CRP?	Rarely but in <ul style="list-style-type: none"> • SLE patients where the ESR may be raised but CRP remains normal • some low-grade bone and joint infections (e.g. in joint prosthesis infections due to low-level pathogens such as coagulase negative staphylococci) 	