GUIDELINES ON USE OF C-REACTIVE PROTEIN

INTRODUCTION

C-Reactive Protein (CRP) is the assay of choice in most situations when detection or monitoring of the acute phase response is required. CRP is specific for the acute phase response and unlike ESR is not elevated due to other causes. It has a rapid response time, short half life (8 hours), large incremental change and its catabolism is not affected by the type of inflammation.

Erythrocyte sedimentation rate (ESR) has been widely used as a measurement of the acute phase response but in most situations CRP is a better measure and should almost always REPLACE ESR.

USE OF CRP

1. Screening for Organic Disease.
   A normal CRP eliminates many possible pathologies. Some serious conditions may only stimulate CRP weakly (e.g. SLE, leukaemia, ulcerative colitis, paraproteinaemia), but should be recognisable clinically or with other blood tests e.g. FBC.

   In elderly patients the CRP can be useful in determining presence of inflammatory or infective processes when patients present with general deterioration and confusional state. In this application the non-specific characteristics of ESR make it a valuable addition to CRP as a screen for ‘illness.’

2. Detection and Management of Infection
   Major elevations of CRP are seen in most systemic microbial infections, particularly Gram +ve and Gram -ve bacterial infections. Viral, mycobacterial and parasitic infection may only provide a modest stimulus and thus CRP may be useful in the differential diagnosis of meningitis.

   CRP measurement may be useful to provide rapid, early evidence of infection following surgery and infection in immunosuppressed patients. In these applications, serial measurements on alternate days are most useful.

3. Monitoring Extent and Activity of Disease
   • Connective tissue disease
     In rheumatic diseases serum CRP levels is the single most precise, objective laboratory measure of disease activity and response to treatment. In SLE and related diseases, where CRP is stimulated weakly, increased CRP may provide evidence of infection.

   • Inflammatory bowel disease

     Since CRP will be elevated due to other possible intercurrent causes of acute phase response, particularly infections, these should be excluded.

INDICATIONS FOR ESR

As already stated, CRP should replace (and not be an additional test to ESR) in most situations where a measure of acute phase response is required. However, the slow response of ESR and its non-specific nature make it useful addition to CRP as a general ‘illness’ screen in elderly patients for detection of chronic disease, in particular paraproteinaemias.
REFERENCE RANGES FOR CRP

Most patients (90%) without organic disease have CRP levels less than 3mg/L and 99% have levels less than 10mg/L. Neonates are unable to induce CRP synthesis to the same extent as adults and the neonatal reference range is lower.

**Reference ranges:**

**Adult:**
- Less than 8 mg/L: Normal
- 10 to 40 mg/L: Mild inflammation, some viral infections
- 40 to 200 mg/L: Acute inflammation, bacterial infection
- > 300 mg/L: Extensive trauma, severe bacterial infection

**Neonate:** Less than 3.5 mg/L: Normal

**MAJOR elevation of CRP seen in:**
- Infections
- Inflammatory disease: Rheumatoid arthritis, Ankylosing spondylitis, Systemic vasculitis, Polymyalgia rheumatica, Crohns disease
- Malignant Neoplasia: Lymphoma, Hodgkins carcinoma, Sarcoma
- Necrosis: Myocardial Infarction, Tumour embolization, Acute pancreatitis
- Trauma: Surgery, burns, fractures

**MINOR (or no) elevation of CRP seen in:**
- SLE
- Systemic sclerosis
- Dermatomyositis
- Ulcerative colitis
- Leukaemia
- Paraproteinaemias