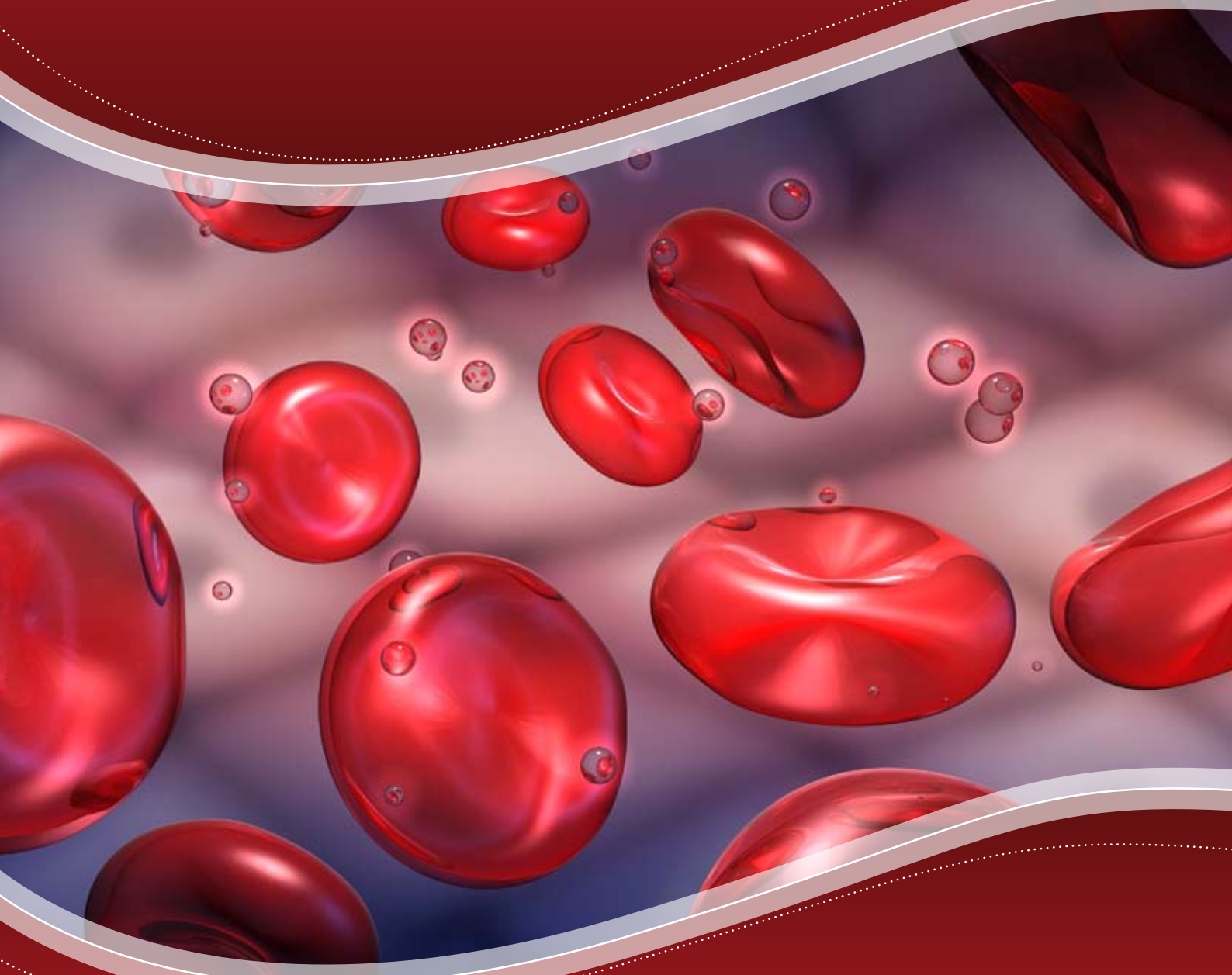
CLINICAL AUDIT

CRP vs ESR



RNZCGP endorsed
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MOPs
Valid to September 2012

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Introduction

Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) are some of the most commonly requested tests by New Zealand general practitioners. ESR is being performed about twice as often as CRP, but it is now recognised that in most situations CRP provides more valuable information to the clinician.

Recommendations

1. Choose CRP first on most occasions.
2. Seldom request ESR and CRP simultaneously.

Issues

CRP and ESR are both used as markers of acute phase response, although CRP has advantages over ESR.

1. CRP is a better measure of acute phase response

- CRP shows rapid response to inflammation: increasing within hours of stimulus, and then returning rapidly to normal following resolution.
- There are distinct ranges for normal and abnormal in CRP reference ranges, without variations for age or gender.
- CRP is more sensitive than ESR to subtle changes in the acute phase response.

2. Many non-pathological processes interfere with ESR results

CRP is a direct measure of the inflammatory process, whereas ESR is an indirect measure. The ESR test reflects the concentration of several acute phase proteins, in particular fibrinogen, β-globulins, α-globulins and albumin. Any non-related condition that affects any of these contributing proteins can therefore be reflected in the ESR result.

3. The choice of whether to test CRP or ESR should be based on the clinical presentation of the patient

There are few studies that compare the use of ESR and CRP, hence there are only a few conditions for which there are clear recommendations. As a result, the best approach is to consider the various clinical questions that may be posed during the course of the consultation.

Table 1: ESR and CRP testing

Question	CRP	ESR	Comments
Screening asymptomatic patients?			Unlikely to be useful
I know this patient is ill but I don't know why.	✓		Actual level of CRP helpful
Could this patient have a significant bacterial infection?	✓		CRP good, ESR slow response
Could the patient have post-op infection?	✓		CRP good, ESR slow response
Has the infection responded to this antibiotic?	✓		CRP good, ESR slow response
Is this RTI more serious than it seems?	✓		Level of CRP useful
Is this patient responding to a trial of steroid therapy?	✓		CRP good, ESR slow response
Does this patient have PMR?	✓	✓	PMR with a normal ESR occasionally occurs
Monitoring PMR	✓		CRP more sensitive indicator of activity
Does this patient have temporal arteritis/ GCA?	✓	✓	TA with a normal ESR occasionally occurs
Monitoring temporal arteritis/GCA?	✓		CRP more sensitive indicator of activity
What is the cause of this/these inflamed joints?	Little use	?	Must be interpreted in clinical context
Monitoring Rheumatoid arthritis	✓		CRP better measure of the disease activity
Monitoring SLE?	✓	✓	CRP normal during flare, but elevated in infection
Why is the platelet count elevated?	✓	✓	Many different causes which may include inflammation
Prediction of cardiovascular disease	?		Role not yet established

References

1. Deodhare SG. C-Reactive Protein: Clinical Applications. http://www.embeediagnostics.com/features/crp.htm (Accessed 23 May 2005)
2. Gill M. A handbook for the Interpretation of Laboratory Tests. Diagnostic Medlab, Auckland, August 2000.
3. Husain T, Kim D. C-Reactive Protein and Erythrocyte Sedimentation Rate in Orthopaedics. The University of Pennsylvania Orthopaedic Journal 2002;15:13-16
4. CRP vs ESR: Assessing & Measuring the Inflammatory Response, bpac^{nz} July 2005

Plan

Indicators

1. CRP testing performed is appropriate.
2. ESR testing performed is appropriate.
3. Combined ESR and CRP testing is appropriate.

Criteria

1. Requests for CRP are compatible with the recommendations in Table 1.
2. Requests for ESR are compatible with the recommendations in Table 1.
3. Combined testing of CRP and ESR is requested rarely.

Standards

1. Requests for CRP are compatible with the recommendations in Table 1 in at least 75% of patient notes.
2. Requests for ESR are compatible with the recommendations in Table 1 in at least 75% of patient notes.
3. Simultaneous measurement of CRP and ESR occurs in less than 10% of patient notes.

Data

Which patients are included?

This audit should include patients over the age of 18 years who have had a CRP and/or and ESR test performed in the previous 12 months.

Identifying patients

This audit should include patients over the age of 18 years who have had a CRP and/or and ESR test performed in the previous 12 months.

Where should the data collected from?

Data required to complete this audit can be collected from patient notes.

Sample size and type

Number of eligible patients will vary according to your practice demographics. Identify at least 30 patients for this audit.

What data should be collected?

For each eligible patient, the following questions should be answered:

- Are requests for CRP compatible with the recommendations in Table 1?
- Are requests for ESR compatible with the recommendations in Table 1?
- Is simultaneous measurement of CRP and ESR performed only rarely?

The answers to these questions can be recorded in the data sheet (page 6).

Data analysis

Use the data sheet to record your data.

Calculate the percentage of patients that reach each criterion.

Compare these percentages to the standards set in advance by the practice team. Standards are suggested in this protocol but may also be set at a practice/practitioner level. Discussion amongst peers may be useful in establishing standards.

Data sheet – cycle 1

Audit: Optimal use of CRP and ESR when measuring the inflammatory response

Date of data collection: _____

Patient Number	Requests for ESR appropriate	Requests for CRP appropriate	Requests for both CRP and ESR appropriate?
	YES/NO	YES/NO	YES/NO
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
Total (Yes)			
% (Yes)			

Data sheet – cycle 2

Audit: Optimal use of CRP and ESR when measuring the inflammatory response

Date of data collection: _____

Patient Number	Requests for ESR appropriate	Requests for CRP appropriate	Requests for both CRP and ESR appropriate?
	YES/NO	YES/NO	YES/NO
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
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17			
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20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
Total (Yes)			
% (Yes)			

Identifying opportunities for CQI

Taking action

The first step in taking action is to identify where gaps exist between expected and actual performance and decide on priorities for change.

Once priority areas for change have been decided on, an action plan should be developed to implement any changes.

The plan should assign responsibility for various tasks to specific members of the practice team and should include a timeline.

It is important to include the whole practice team in the decision-making and planning process.

It may be useful to consider the following points when developing a plan for action (RNZCGP 2002).

1. **Problem solving process**
    - What is the problem or underlying problem(s)?
    - Change it to an aim.
    - What are the solutions or options?
    - What are the barriers?
    - How can you overcome them?

2. **Overcoming barriers**
    - Identifying barriers can provide a basis for change.
    - What is achievable? – find out what the external pressures on the practice are and discuss ways of dealing with them in the practice setting.
    - Identify the barriers.
    - Develop a priority list.
    - Choose one or two achievable goals.

3. **Effective interventions.**
    - No single strategy or intervention is more effective than another, and sometimes a variety of methods are needed to bring about lasting change.
    - Interventions should be directed at existing barriers or problems, knowledge, skills and attitudes, as well as performance and behaviour.

Review

Monitoring change and progress

It is important to review the action plan against the timeline at regular intervals with the practice team. It may be helpful to discuss the following questions:

- Is the process working?
- Are the goals for improvement being achieved?
- Are the goals still appropriate?
- Do you need to develop new tools to achieve the goals you have set?

Following the completion of the first cycle, it is recommended that practices complete the first part of the CQI activity summary sheet (Appendix 1).

Undertaking a second cycle

In addition to regular reviews of progress with the practice team, a second audit cycle should be completed in order to quantify progress on closing the gaps in performance.

It is recommended that the second cycle be completed within 12 months of completing the first cycle. The second cycle should begin at the data collection stage. Following the completion of the second cycle it is recommended that practices complete the remainder of the CQI activity summary sheet.

Claiming MOPS credits

This audit has been endorsed by the RNZCGP as a CQI Activity for allocation of MOPS credits. General practitioners taking part in this audit can claim credits in accordance with the current MOPS programme. This status will remain in place until **September 2012**.

To claim MOPS points, you can indicate completion of the audit on the annual claim sheet, or alternatively you can go to the RNZCGP website, and claim your points at "MOPS online" at **www.rnzcgp.org.nz**. You receive 10 credits per audit cycle.

As the RNZCGP frequently audit claims you should retain the following documentation, in order to provide adequate evidence of participation in this audit:

1. A summary of the data collected

and

2. A Continuous Quality Improvement (CQI) Activity summary sheet (included as Appendix 1).

Appendix 1: RNZCGP Summary Sheet – CQI Activity

DOCTORS NAME	

The activity was designed by (please tick appropriate box):

- ☐ RNZCGP
- ☑ Organisation e.g. IPA/PHO/BPAC (name of organisation) bpac^nz
- ☐ Individual (self)

TOPIC	**Optimal use of CRP and ESR when measuring the inflammatory response**
Describe why you chose this topic (relevance, needs assessment etc):	

FIRST CYCLE (10 Credits)

1. DATA	**Information collected**
Date of data collection:	
Please attach: ▪ A summary of data collected **or** ▪ If this is an organisation activity, attach a certificate of participation.	

2. CHECK	Describe any areas targeted for improvement as a result of the data collected.

3. ACTION	Describe how these improvements will be implemented.

4. MONITOR	Describe how well the change process is working. When will you undertake a second cycle?

SECOND CYCLE (10 Credits)

1. DATA	**Information collected**
Date of data collection:	
Please attach: ▪ A summary of data collected **or** ▪ If this is an organisation activity, attach a certificate of participation.	

2. CHECK	Describe any areas targeted for improvement as a result of the data collected.

3. ACTION	Describe how these improvements will be implemented.

4. MONITOR	Describe how well the change process is working.

COMMENTS	

This audit has been endorsed by the RNZCGP as a CQI Activity for allocation of MOPS credits. This status will remain in place until September 2012.See page 9 for further information about claiming MOPS credits.

AUDIT CHECKLIST

Date:

1	☐	Audit Planning	
		FIRST CYCLE	
2	☐	Data collected	
3	☐	RNZCGP Summary Sheet completed	
4	☐	MOPS Credits claimed	
		SECOND CYCLE	
5	☐	Data collected	
6	☐	RNZCGP Summary Sheet completed	
7	☐	MOPS Credits claimed	

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