**Audit of CEA requesting from primary care in NHSGGC (2017)**

**Background**

According to NICE, SIGN and local guidelines, measurement of CEA should only be used for **surveillance** purposes in patients with **known colorectal cancer following treatment** [1-3]. The information that can be derived from a CEA test is restricted by its lack of (organ) specificity and sensitivity in the early stages of colorectal cancer (CRC) [4]. Those in primary care should refer patients using a suspected cancer referral pathway for CRC where appropriate (depending on age and symptoms) [5].

CEA tests are frequently requested from primary care and received by the clinical biochemistry laboratory.

**Aim**

The aim of this audit was to determine the frequency of requesting in primary care and whether these requests are made in line with recommended guidelines.

**Data collection**

Data were gathered for a period of 1 year (1/4/16 – 31/3/17) from 200 GP practices across NHSGGC. Data included patient details (name/CHI), practice location and name of requesting GP. Clinical Portal and Telepath (laboratory) computer systems were used to ascertain the reason for CEA testing for individual patients and to access clinical details to determine the appropriateness of the request (i.e. diagnosis or history of CRC in clinical letters/colonoscopy reports prior to the date of the test).

An inappropriate request was defined as that in which the patient had:

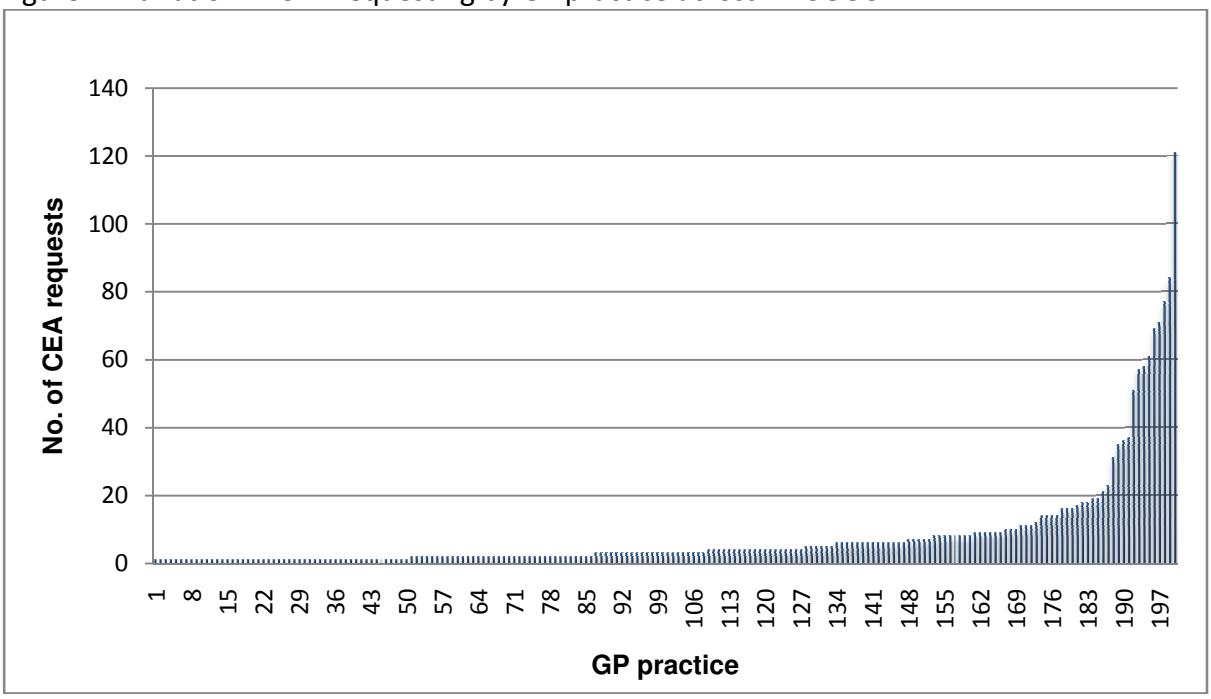
a) no prior diagnosis of CRC, or
b) history of benign polyps identified and excised (which does not require follow-up by CEA testing).

**Results**

<u>Variation in requesting rates</u>

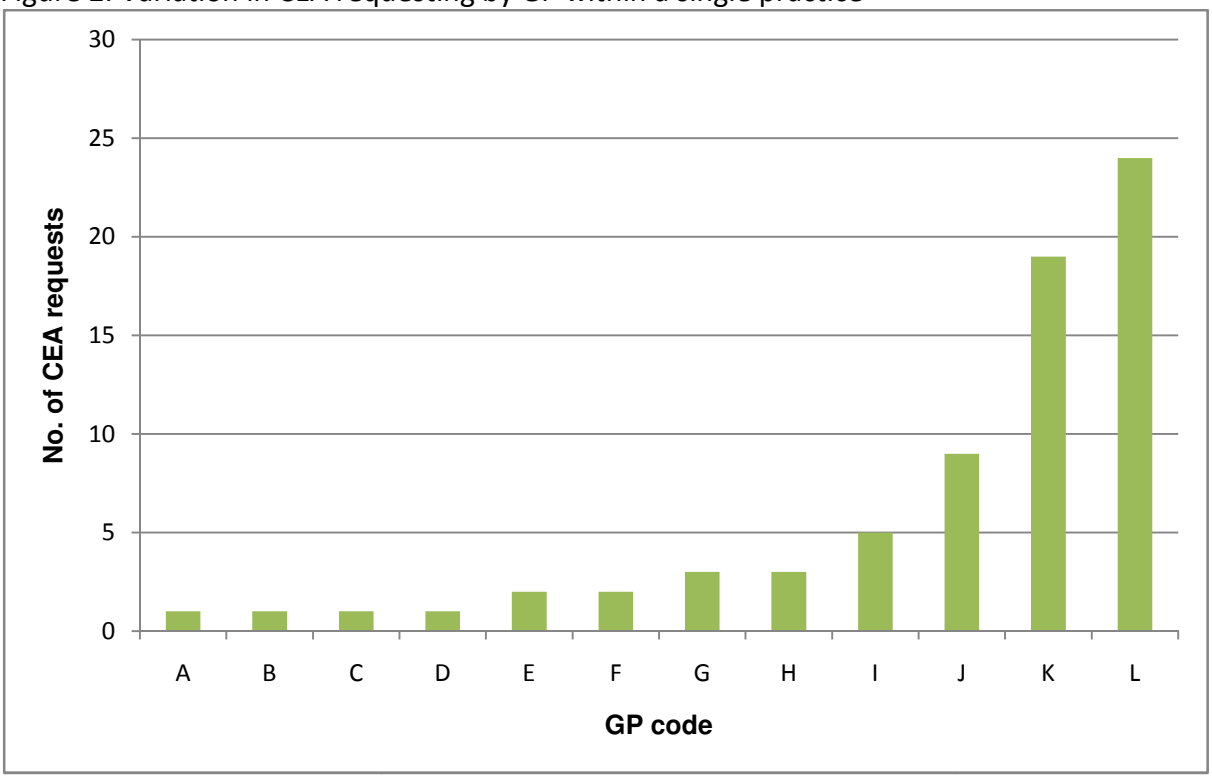
A total of 1634 CEA tests were performed during this period. As shown in figure 1, there was significant variation in the number of CEA requests made by each practice, ranging from 1 to 121 requests per annum.

Figure 1. Variation in CEA requesting by GP practice across NHSGGC




Even within an individual practice, there was considerable variation in CEA requesting between GPs (fig. 2).

Figure 2. Variation in CEA requesting by GP within a single practice



Appropriateness of requesting

Due to the large quantity of information obtained, more detailed analysis was focused on the five practices requesting the highest number of CEA tests, which together accounted for 25.8% of the total.

Figure 3. Appropriateness of CEA requesting from five GP practices with the highest requesting rates (overall 7.4% of requests were deemed appropriate)

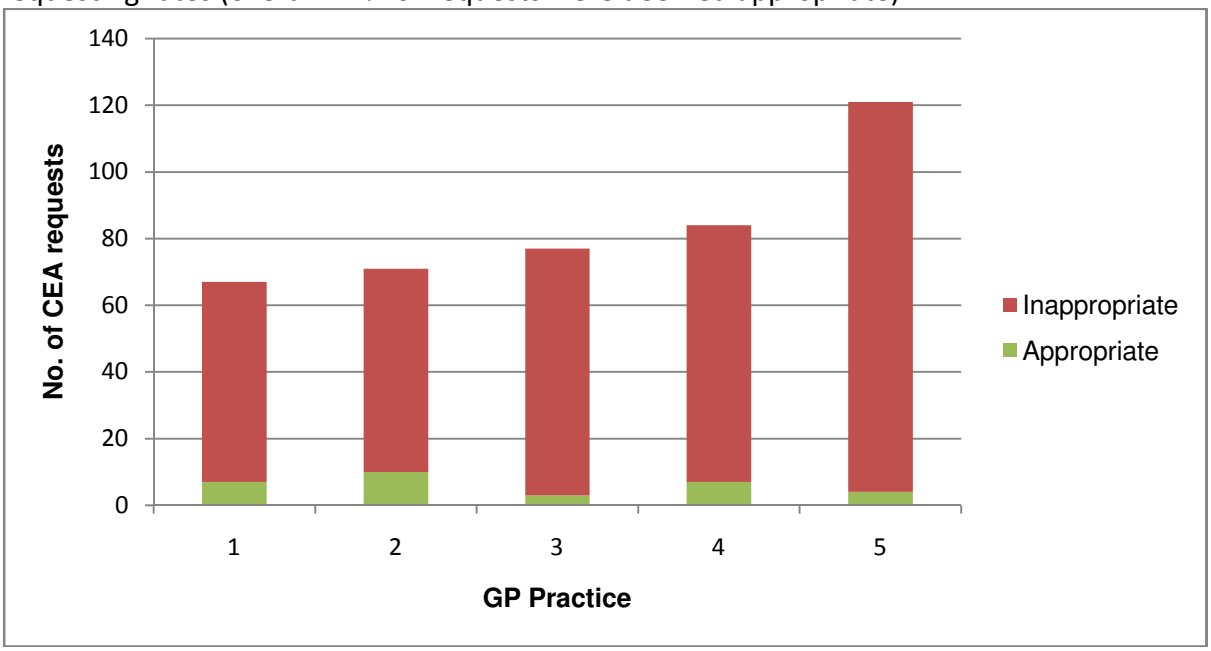
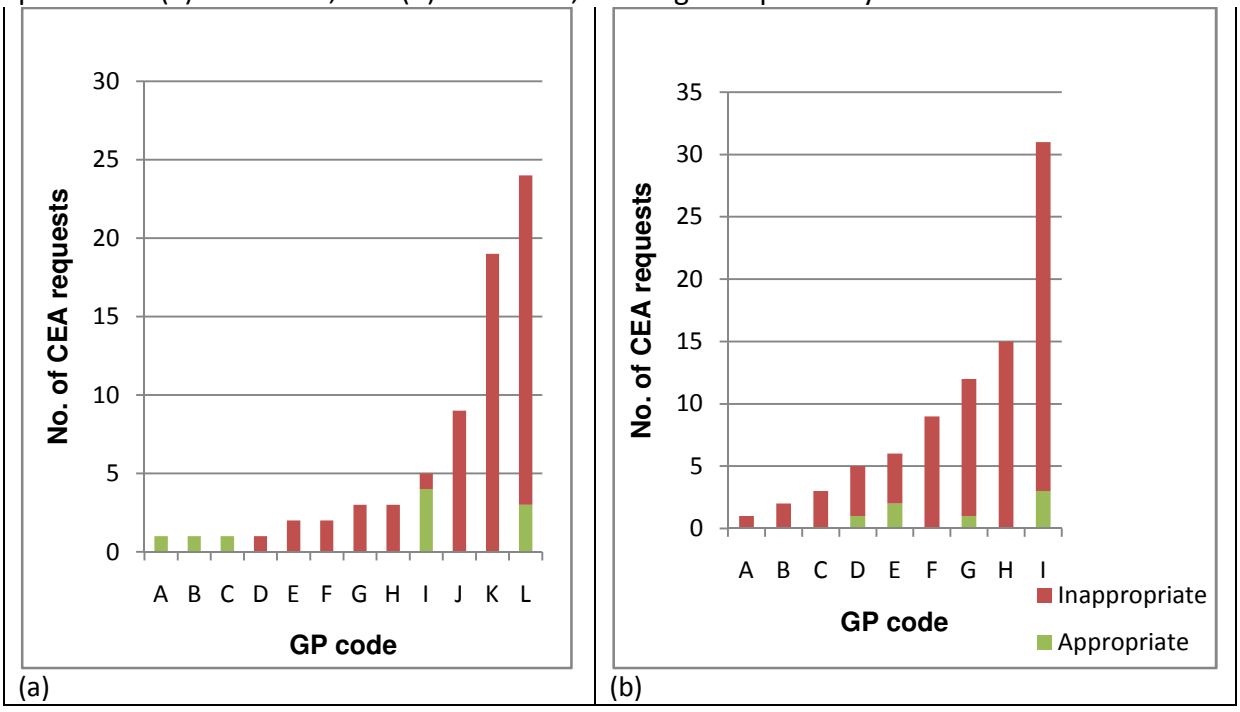



Fig 4. Examples of the variation in CEA requesting rates between GPs within a two GP practices - (a) Practice 2, and (b) Practice 4, from fig 3 respectively.



The only indication for CEA requesting in primary care is for monitoring known CRC patients, thus it is clear that the majority of requests (92.6%) were not clinically appropriate (fig. 3). A variety of other reasons were given for requesting including “screening" and investigating changes in bowel habit. This suggests that a suspected diagnosis was being investigated, rather than monitoring of a confirmed case. Use of CEA in this manner is not advised. CEA is not specific for CRC, thus may be elevated for a variety of reasons, leading to diagnostic confusion and unnecessary further investigation. Furthermore, CEA is not suitable for “screening” as it lacks diagnostic sensitivity for early stage CRC, potentially leading to false reassurance for the patient.
The recommended procedure for making a new diagnosis of colorectal cancer in primary care is evaluation of symptoms and clinical history and, if necessary, referral for colonoscopy, as outlined in the Scottish Cancer Referral Guidelines [6].

Cost implications

92.6% (1513) of the CEA requests made by primary care in the year studied were inappropriate. At a cost of £3-50 per CEA test, this equates to a potential cost saving of £5296 per annum if requesting was restricted to management of known CRC patients.

**Conclusions**

The audit found most instances of CEA testing to be inappropriate with significant variation in requesting rates both between and within individual practices. An elevated CEA result may be due to factors other than cancer. Similarly a normal CEA result does not exclude malignancy. Therefore using this test without sound basis can lead to confusion with interpretation. Comments on CEA reports were often used to inform clinicians about the unsuitability of the CEA test as a screening tool, however this advice was at times ignored and CEA continued to be requested on patients for whom the results would not provide useful information.

As demonstrated by this audit, adherence to the recommended guidelines would result in both clinical and financial benefits.

**Recommended actions**

1. Dissemination of audit findings to primary care
    a. publish audit report on NHSGGC Biochemistry website
    b. include summary of audit in GP Newsletters
2. Education
3. Links to further information on appropriate testing
    a. SIGN/NICE guidelines
    b. Primary care tumour marker bookmark (SCBMDN and Pathology Harmony UK)
    c. NHSGGC biochemistry website
4. Continue to provide comments on CEA reports to primary care
5. Feedback on test requesting rates to primary care on a regular basis
6. Re-audit 6-12 months after the above actions have been completed

**References**


1. NICE clinical guideline CG131. Colorectal cancer: diagnosis and management (2011; updated Dec 2014)
2. Scottish Clinical Biochemistry Managed Diagnostic Network (SCBMDN) and Pathology Harmony (UK). (2017) Tumour marker requesting bookmark. URL: http://www.mcns.scot.nhs.uk/scbmdn/projects/tumour-markers/ [accessed 04/08/2017]
3. SIGN 126: Diagnosis and management of colorectal cancer (2011; revised Aug 2016)
4. Sturgeon C. Practice Guidelines for Tumor Marker Use in the Clinic. *Clinical Chemistry* 2002: 48 (8): 1151-1159
5. NICE guideline NG12. Suspected cancer: recognition and referral (2015; updated Jul 2017)
6. Scottish Cancer Referral Guidelines website: http://www.cancerreferral.scot.nhs.uk/