

Tumour Markers in Primary Care: A Summary

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Introduction

- Tumour markers are molecules that may be present in higher than usual concentrations in body fluids of patients with cancer
- 15 million measurements per year (UK)
- JR laboratory receives 38,000 requests per year for serum tumour markers
- Increasing number of requests from primary care

Top 10 serum tumour markers

AFP

Calcitonin

CA125

CA15-3

CA19-9

CEA

HCG

Paraproteins

PSA

Thyroglobulin

Existing Evidence

- Multiple guidelines are published on uses
- **Useful** for monitoring prognosis, treatment response and recurrence
- **Not useful** in diagnosis except:
 - AFP for hepatocellular carcinoma
 - PSA for prostate cancer
 - Paraproteins
 - CA-125 for ovarian cancer
- Usefulness often limited by lack of specificity

JR Biochemistry Audits

2002 – T Lang. Review of tumour marker requests for 2/12

Focused on CA12-5, CEA, CA19-9

302 samples, 12.5% from primary care

Reviewed indications against current guidelines

2006 – J Wallace. Review of single tumour marker requests 1 yr

Reviewed all requests for 2005 = 704 for CA12-5, 361 for CEA

Fax questionnaire to GP for reason of request Feb 06

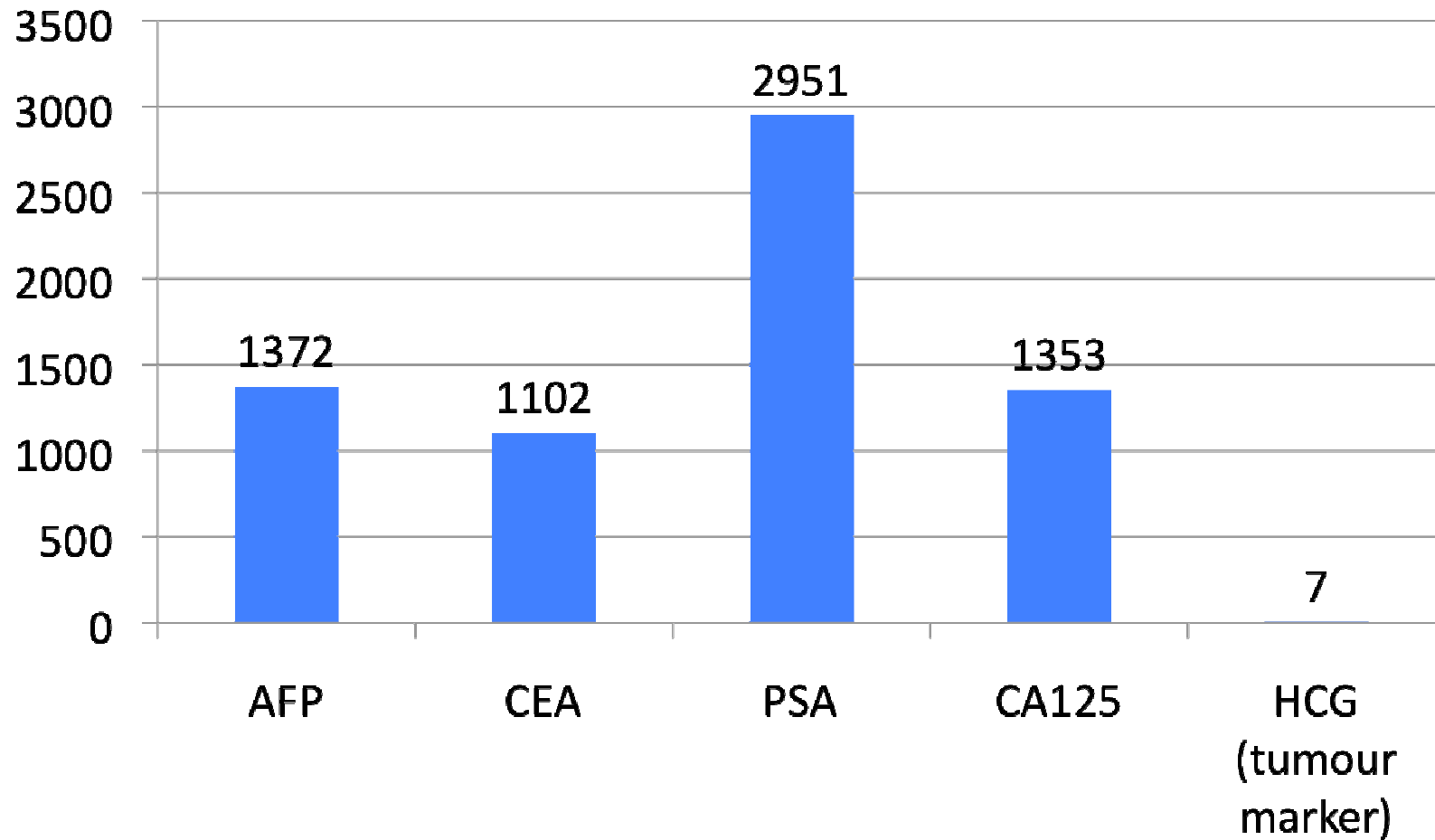
2009 – S Benafif. Tumour marker requests for 6/12

Compared ORH with GP requesting pattern

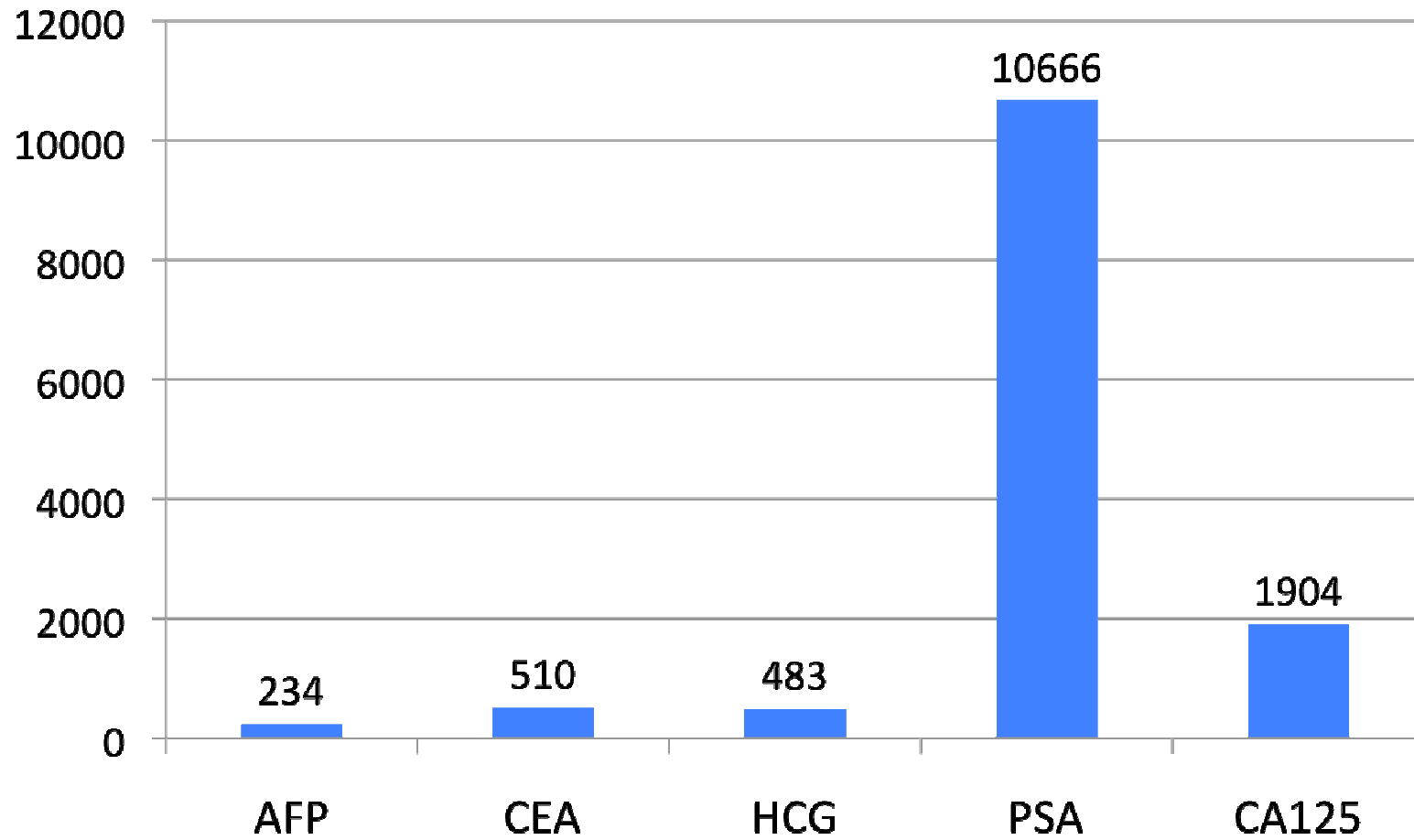
PSA 43% of total (ORH) vs. 77% of total (GP)

Reviewed indications, 31% did not have clinical details

ORH requests (Apr-Oct 09)



GP requests (Apr-Oct 09)



Overall findings

For a single tumour marker:

Commonly clinical details are not given

Requests based on non-specific symptoms

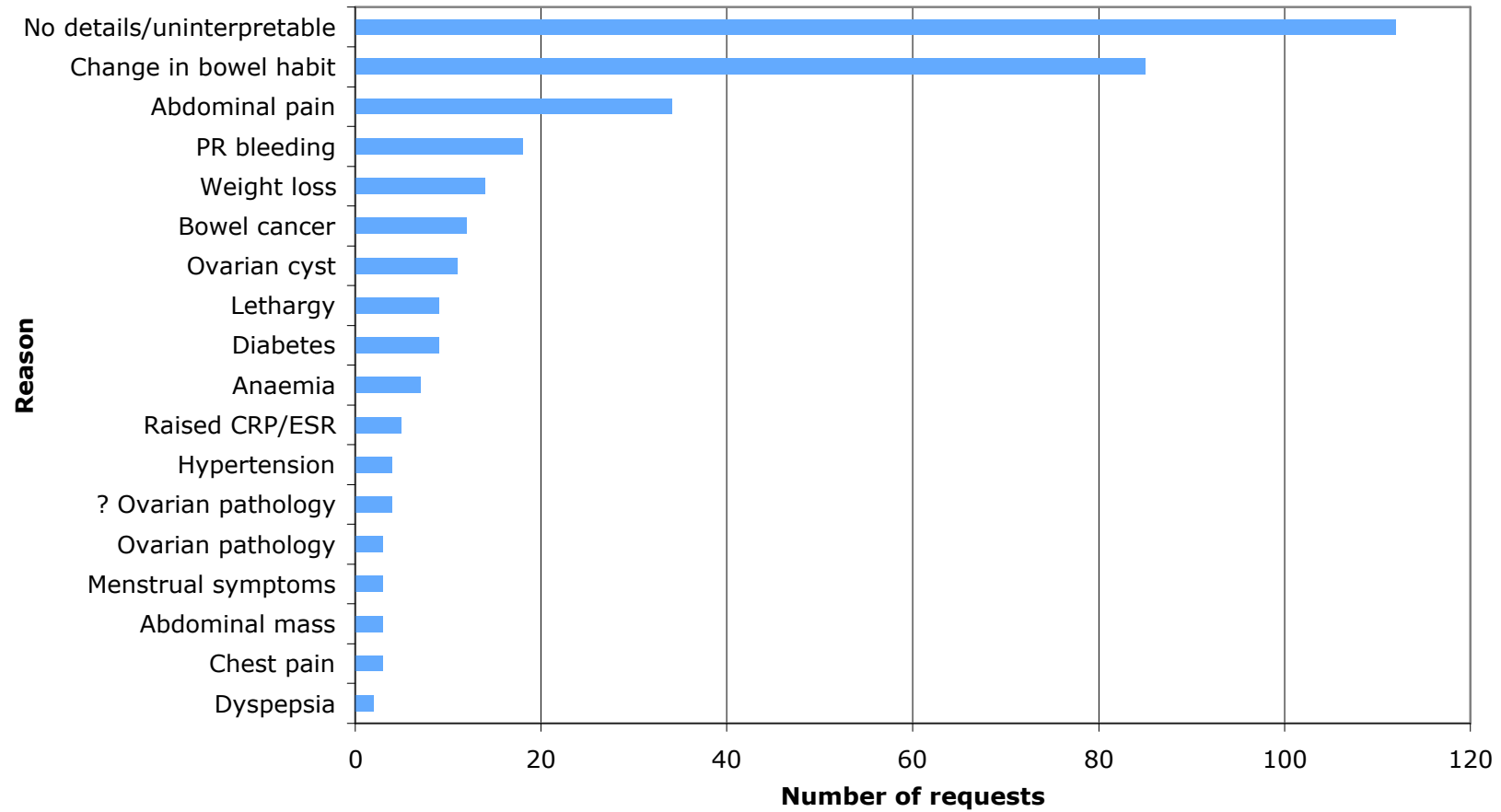
Highest number of requests:

CEA

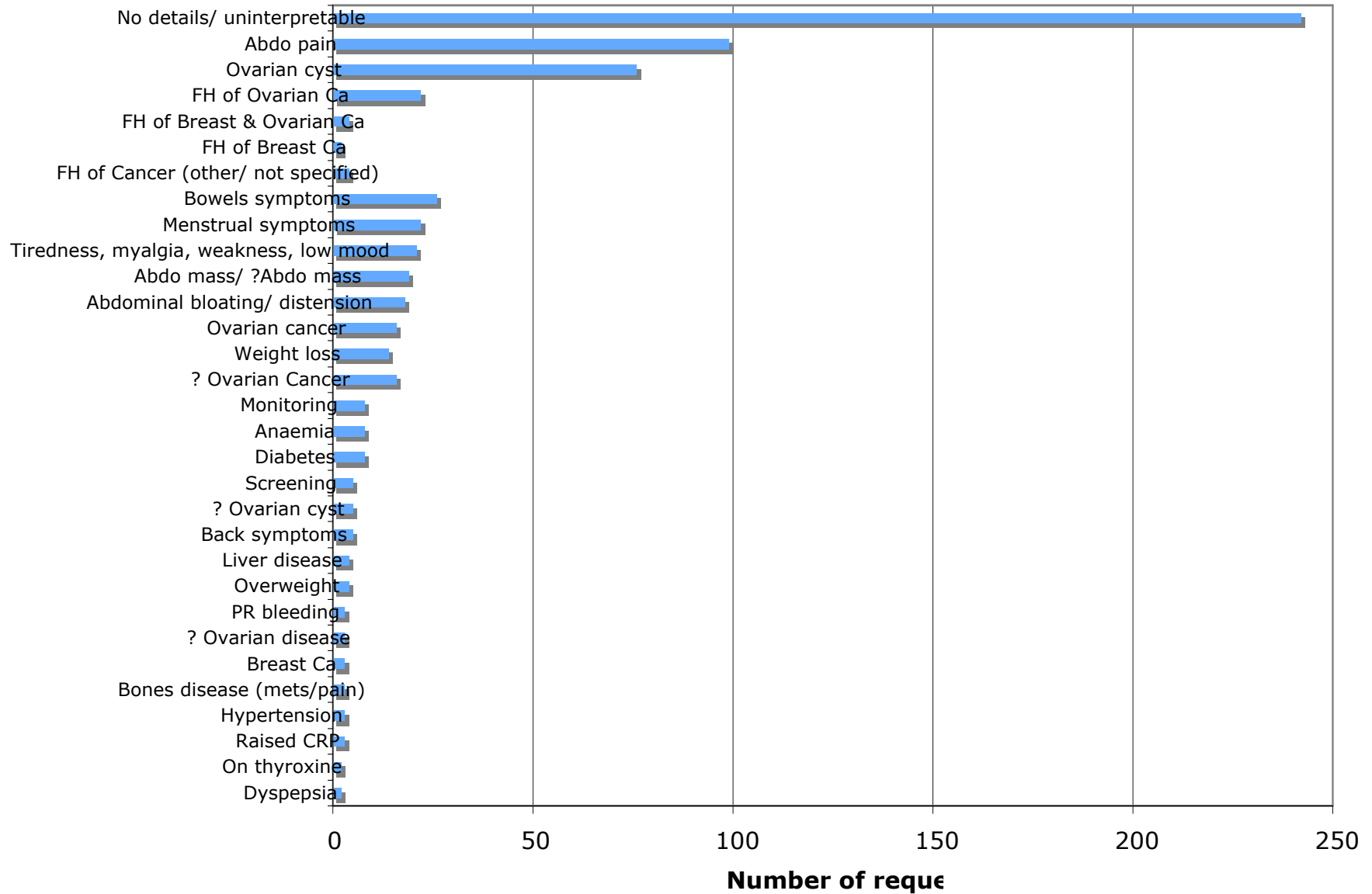
CA12-5

PSA

Reasons for single CEA requests in 2005



Single GP Ca 125 requests in



JR Evidence

Audit limited by clinical details given

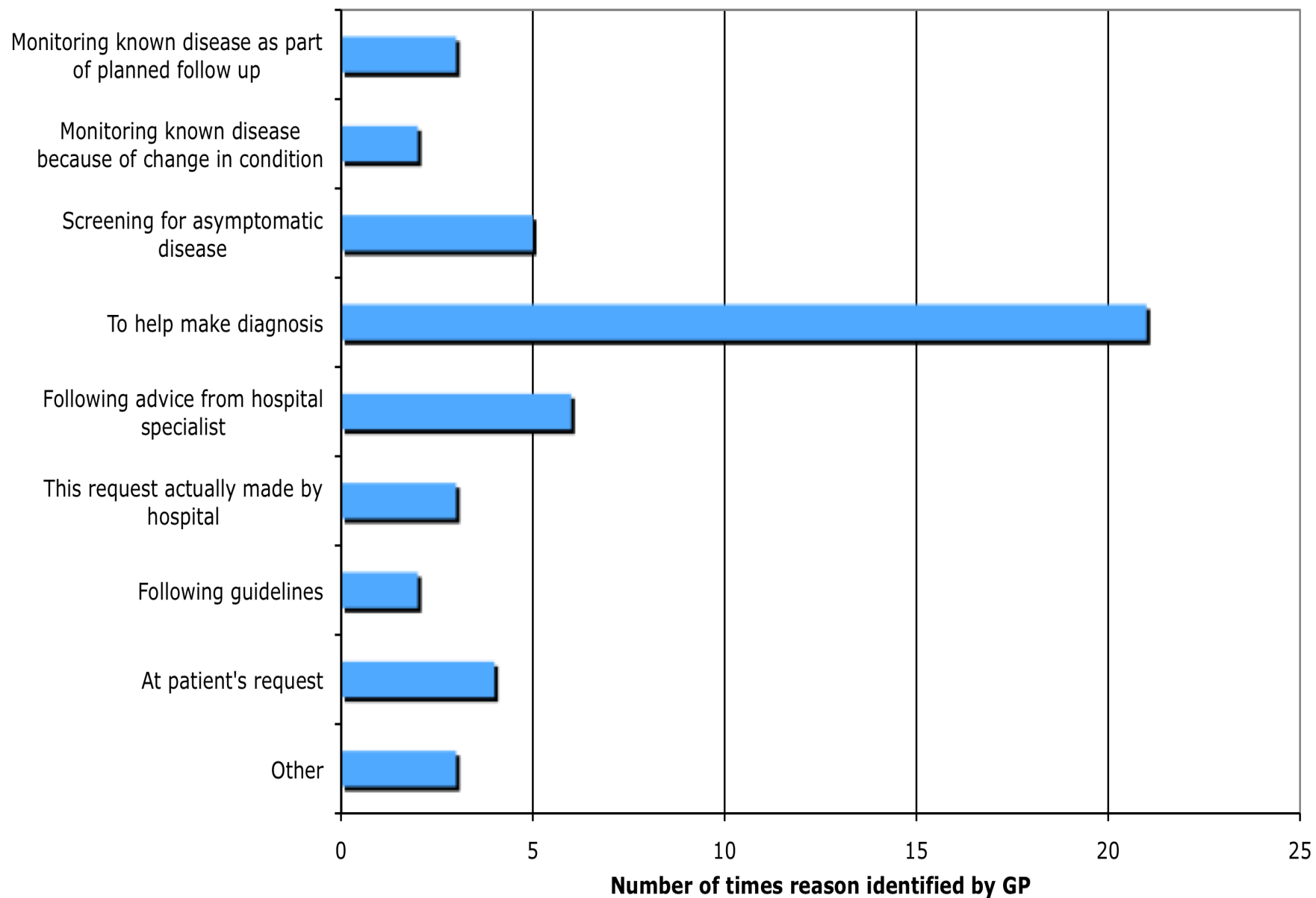
High number of inappropriate tests

Eg CA12-5 & CA15-3 requests on male patients

Current guidelines not being followed

Tumour markers *are* being used for diagnosis

Reasons for Tumour Marker Requests



References

- **Sturgeon C, Lai LC, Duffy MJ. Serum Tumour Markers: how to order and interpret them. BMJ 2009;339:b3527 www.bmj.com**
- Smellie WSA, Forth J, Sundar S, Kalu E, McNulty CA, Sherriff E, Watson ID, Croucher C, Reynolds TM, Carey PJ. Best Practice in Primary Care Pathology. Review 4. J Clin Pathol 2006;59:893–902 bettertesting.org.uk
- Duffy MJ. Evidence for the clinical use of tumour markers. Ann Clin Biochem 2004; 41: 370–377
- McGinley PJ, Kilpatrick ES. Tumour markers: their use and misuse by clinicians. Ann Clin Biochem. 2003 Nov; 40 (Pt 6) : 643-7.
- Sturgeon C. Practice Guidelines for Tumour Marker use in the clinic. Clinical Chemistry 2002; 48:8 1151–1159

Discipline	Banding (discipline specific)	Test Name	NHS 08/09 Price £	NHS 09/10 Price £
Clinical Biochemistry	Band 20	Plasma Lactate Dehydrogenase	1.04	1.06
Clinical Biochemistry	Band 60	PROS SPEC AG	3.11	3.16
Clinical Biochemistry	Band 90	Serum CA 12-5	5.19	5.28
Clinical Biochemistry	Band 90	AFP	5.19	5.28
Clinical Biochemistry	Band 90	CA-125	5.19	5.28
Clinical Biochemistry	Band 90	CA-153	5.19	5.28
Clinical Biochemistry	Band 90	CEA	5.19	5.28
Clinical Biochemistry	Band 90	Serum CA 15-3	5.19	5.28
Clinical Biochemistry	Band 90	Serum HCG (Tumour marker)	5.19	5.28
Clinical Biochemistry	Band 90	HCG	5.19	5.28
Clinical Biochemistry	Band 90	Serum Alphafetoprotein (Tumour marker)	5.19	5.28
Clinical Biochemistry	Band 90	Serum CA 19-9	5.19	5.28
Clinical Biochemistry	Band 90	Serum Carcinoembryonic Antigen	5.19	5.28
Clinical Biochemistry	Band 180	Urine metadrenaline	31.14	31.67
Clinical Biochemistry	Band 180	Urine 3 Methoxytyramine	31.14	31.67
Clinical Biochemistry	Band 180	Urine Normetadrenaline	31.14	31.67
Clinical Biochemistry	Band 180	Urine 5-Hydroxyindole acetic acid	31.14	31.67
Immunology	Band 20	Immunoglobulins - IgA	3.67	3.73
Immunology	Band 20	Immunoglobulins - IgG	3.67	3.73
Immunology	Band 20	Immunoglobulins - IgM	3.67	3.73
Immunology	Band 50	Serum Electrophoresis	11.02	11.21
Immunology	Band 50	Urine electrophoresis	11.02	11.21
Immunology	Band 90	Immunoglobulin Light chain per day	22.04	22.41
Immunology	Band 90	FREE LITE	22.04	22.41
Immunology	Band 90	Immunoglobulins (warm)	22.04	22.41
Immunology	Band 100	Serum immunofixation	29.39	29.89
Immunology	Band 100	Urine immunofixation	29.39	29.89

Benign conditions that may cause rises (some transient) in serum tumour marker levels that may lead to incorrect interpretation

- Acute cholangitis (CA19-9)
- Acute hepatitis (CA125, CA15-3)
- Acute and/or chronic pancreatitis (CA125, CA19-9)
- Acute urinary retention (CA125, PSA)
- Arthritis/osteoarthritis/rheumatoid arthritis (CA125)
- Benign prostatic hyperplasia (PSA)
- Cholestasis (CA19-9)
- Chronic liver diseases such as cirrhosis, chronic active hepatitis (CA125, CA15-3, CA19-9, carcinoembryonic antigen (CEA))
- Chronic renal failure (CA125, CA15-3, CEA, human chorionic gonadotrophin) Colitis (CA125, CA15-3, CEA)
- Congestive heart failure (CA125)
- Cystic fibrosis (CA125)
- Dermatological conditions (CA15-3)
- Diabetes (CA125, CA19-9)
- Diverticulitis (CA125, CEA)
- Endometriosis (CA125)
- Heart failure (CA125)
- Irritable bowel syndrome (CA125, CA19-9, CEA)
- Jaundice (CA19-9, CEA)
- Leiomyoma (CA125)
- Liver regeneration (α fetoprotein)
- Menopause (human chorionic gonadotrophin)
- Menstruation (CA125)
- Non-malignant ascites (CA125)
- Ovarian hyperstimulation (CA125)
- Pancreatitis (CA125, CA19-9)
- Pericarditis (CA125)
- Peritoneal inflammation (CA125)
- Pregnancy (α fetoprotein, CA125, human chorionic gonadotrophin) Prostatitis (PSA)
- Recurrent ischaemic strokes in patients with metastatic cancer (CA125) Respiratory diseases such as pleural inflammation, pneumonia (CA125, CEA) Sarcoidosis (CA125)
- Systemic lupus erythematosus (CA125)
- Urinary tract infection (PSA)