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Good clinicians in supportive healthcare systems –

the Danish three-legged strategy for cancer diagnosis

3rd NAEDI Research Conference
London 2015

Peter Vedsted
Professor

Research Centre for Cancer Diagnosis in Primary Care – CaP
The Research Unit for General Practice
Aarhus University
Denmark

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It is sometimes difficult to be a GP…

theguardian

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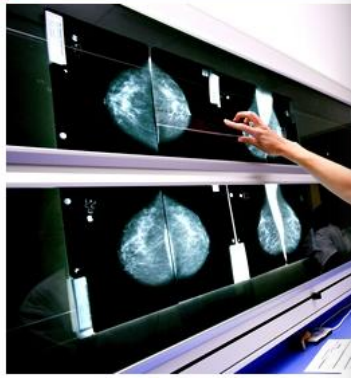
Almost half of cancer patients diagnosed too late

Late detection of condition in 46% of sufferers can greatly reduce chances of survival, warns Cancer Research UK

Denis Campbell, health correspondent
The Guardian, Monday 22 September 2014
Jump to comments (284)



The charity's research found that 46% of all canc
detected until stage three or four. Photograph: B

The Telegraph

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GPs pressured not to send patients to hospital: survey

GPs are being pressured to reduce the number of patients they refer to hospital in order to save money, a survey has suggested.

NDALL

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Patients to be allowed to self-refer for cancer diagnostics without going through GP

12 January 2015 | By Jaimie Kaffash

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Patients will be able to self-refer themselves for cancer diagnostics without needing to go through GPs as part of NHS England's new strategy for tackling cancer, which GP leaders said could 'undermine GPs' gatekeeper role'.

As part of NHS England's early diagnosis programme announced over the weekend, it will pilot initiatives to offer patients the option to self-refer for diagnostic tests, lower referral thresholds for GPs and introduce multi-disciplinary diagnostic centres where patients can have several tests in the same place on the same day.

It will also set up a taskforce to develop a five-year action plan for cancer services based on the pilots that will include representatives from the RCGP, as well as Macmillan Cancer Support, Public Health England and local councils.

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How we diagnose cancer

- **90% of cancers are diagnosed based on symptoms**
- **More than 80-85% are seen in general practice**

Sources e.g.:
- *Elliss-Brookes L, et al. BJC 2012, 1220–1226.*
- *Allgar et al. British Journal of Cancer 2005;92:1959–70*
- *Hansen et al. BMC Health Serv Res. 2011;11:284.*
- *Emery JD, et al. Nat Rev Clin Oncol. 2014;11:38-48.*
- *Vedsted P, et al. Scand J Prim Health Care. 2009;27:193-4.*

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- General practice forms the basis of cancer diagnosis
- And the rest of the healthcare system must support the GP
- A perfect example of integrated healthcare

High quality cancer diagnosis
= Integrate primary and secondary care

Green T, Atkin K, Macleod U. Br J Cancer. 2015

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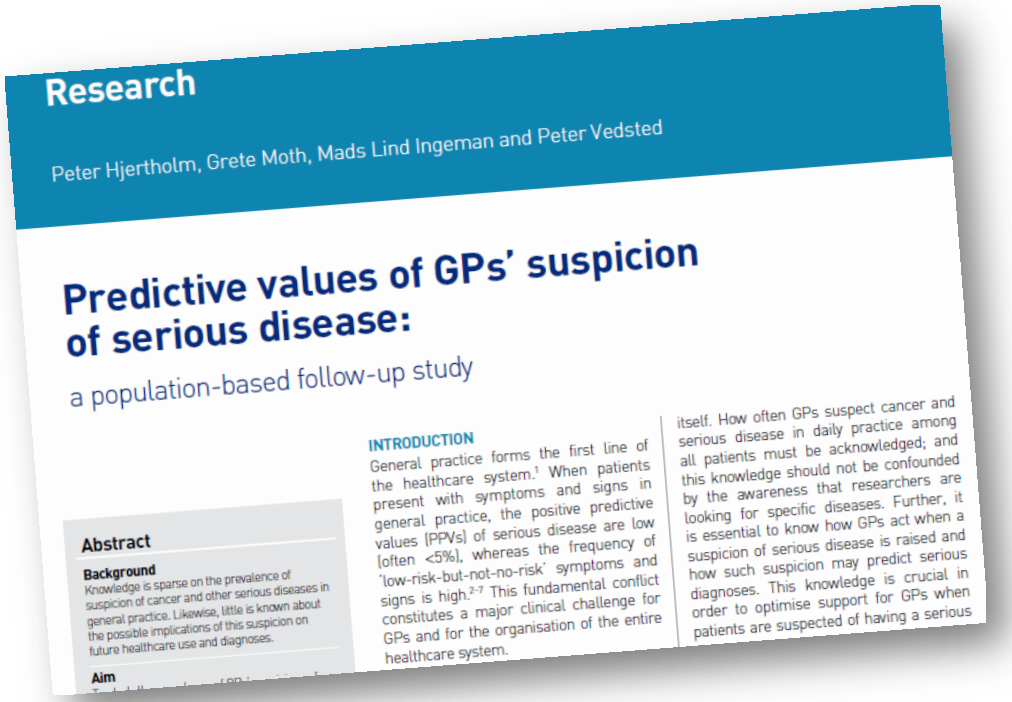
The GP in first line



Research

Peter Hjertholm, Grete Moth, Mads Lind Ingeman and Peter Vedsted

Predictive values of GPs' suspicion of serious disease:

a population-based follow-up study

Abstract

Background
Knowledge is sparse on the prevalence of suspicion of cancer and other serious diseases in general practice. Likewise, little is known about the possible implications of this suspicion on future healthcare use and diagnoses.

Aim

INTRODUCTION
General practice forms the first line of the healthcare system.[1] When patients present with symptoms and signs in general practice, the positive predictive values (PPVs) of serious disease are low (often <5%), whereas the frequency of 'low-risk-but-not-no-risk' symptoms and signs is high.[2-7] This fundamental conflict constitutes a major clinical challenge for GPs and for the organisation of the entire healthcare system.

itself. How often GPs suspect cancer and serious disease in daily practice among all patients must be acknowledged; and this knowledge should not be confounded by the awareness that researchers are looking for specific diseases. Further, it is essential to know how GPs act when a suspicion of serious disease is raised and how such suspicion may predict serious diagnoses. This knowledge is crucial in order to optimise support for GPs when patients are suspected of having a serious

- **Following 6% of consultations, GPs suspected a serious disease**
- **10% of these patients got a new serious disease in 2 months**

Hjertholm P, et al. Br J Gen Pract 2014

Better than 'alarm symptoms'!

M Shapley, G Mansell, JL Jordan, KP Jordan

Positive predictive values of ≥5% in primary care for cancer: systematic review

Mark Shapley, Gemma Mansell, Joanne L Jordan and Kelvin P Jordan

INTRODUCTION

When a patient consults a GP, part of the management of the individual involves an assessment of the probability of serious illness including malignancy. One

BMJ

RESEARCH

Alarm symptoms in early diagnosis of cancer in primary care: cohort study using General Practice Research Database

Roger Jones, Wolfson professor of general practice,[1] Radoslav Latinovic, database manager,[2] Judith Charlton, research assistant,[2] Martin C Gulliford senior lecturer in public health[2]

[1]Department of General Practice and Primary Care, Division of Health and Social Care Research, King's College London School of Medicine at Guy's, King's College and St Thomas' Hospitals, London SE1 6SP

[2]Department of Public Health Sciences, Division of Health and Social Care Research, King's College London School of Medicine at Guy's, King's College and St Thomas' Hospitals, London SE1 3QD

Correspondence to: R Jones roger.jones@kcl.ac.uk

doi: 10.1136/bmj.39171.637106.AE

ABSTRACT

Objective To evaluate the association between alarm symptoms and the subsequent diagnosis of cancer in a large population based study in primary care.

Design Cohort study.

Setting UK General Practice Research Database.

Patients 762 325 patients aged 15 years and older, registered with 128 general practices between 1994 and 2000. First occurrences of haematuria, haemoptysis, dysphagia, and rectal bleeding were identified in patients with no previous cancer diagnosis..

Main outcome measure Positive predictive value of first occurrence of haematuria, haemoptysis, dysphagia, or rectal bleeding for diagnoses of neoplasms of the urinary tract, respiratory tract, oesophagus, or colon and rectum

general practitioners refer less than 5% of their patients each year for specialist opinions and hospital investigations.[1,2] Referral from primary to secondary care is often triggered by a general practitioner's awareness of so called "alarm symptoms," features in the clinical presentation that are considered to predict serious, often malignant, disease. For example, guidelines on the identification of alarm symptoms form the core of the "two week rule" for urgent referral of patients suspected of having cancer,[3,4] and many clinical practice guidelines specify particular symptoms that mandate urgent investigation or referral.[5] However, the evidence base for the alarming nature of many alarm symptoms is weak, and general practitioners often use individual approaches to the collection and analysis of data in the course of consultations.[1]

British Journal of Cancer (2009) 101, S80–S86

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www.bjcancer.com

Full Paper

The CAPER studies: five case-control studies aimed at identifying and quantifying the risk of cancer in symptomatic primary care patients

W Hamilton*,[1]

[1]Department of Community Based Medicine, NIHR School for Primary Care Research, University of Bristol, 25-27 Belgrave Road, Bristol BS8 4AA, UK

BACKGROUND: This paper reviews the background to five primary care case-control studies, collectively known as the CAPER studies (Cancer Prediction in Exeter). These studies, on colorectal, lung, prostate and brain tumours, sought to identify the particular features of cancer as reported to primary care. They also sought to quantify the risk of cancer for symptoms and primary care investigations, both individually and paired together.

METHODS: Two studies were on colorectal cancer: the former with 349 cases used hand searching and coding of entries, while the latter obtained 6442 cases from a national electronic database. The lung and prostate studies had 247 and 217 cases, respectively, and used manual methods. The brain study also used a national electronic database, which provided 3505 cases.

RESULTS: Generally, the symptoms matched previous series from secondary care, though the risks of cancer, expressed as positive predictive values, were lower. Rectal bleeding in colorectal cancer, and haemoptysis in lung cancer both had positive predictive values of 2.4%. The risk of a brain tumour with headache was one in a thousand.

INTERPRETATION: The results identify areas where current guidance on urgent referral for investigation of suspected cancer could be improved.

British Journal of Cancer (2009) 101, S80–S86. doi:10.1038/sj.bjc.6605396 www.bjcancer.com

© 2009 Cancer Research UK

Keywords: diagnosis; primary health care; predictive values

- *Shapley M. Br J Gen Pract 2010*
- *Hamilton W, et al. BJC 2009*
- *Jones R, et al. BMJ 2007*

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But how good do GPs think they are?

What is the probability that a 50-year-old patient has cancer when you choose to refer the patient to urgent referral diagnostic services?

GPs' anticipated risk of cancer	N	%
		20.3
25-49%		
50-74%	160	28.2
75-100%	77	13.6
Total	**568**	**100.0**

Is this because they are unrealistic clinicians?

Or is it the culture of the system they are situated in?

Pedersen A, et al. Journal of Health Services Research & Policy 2015 (In press)

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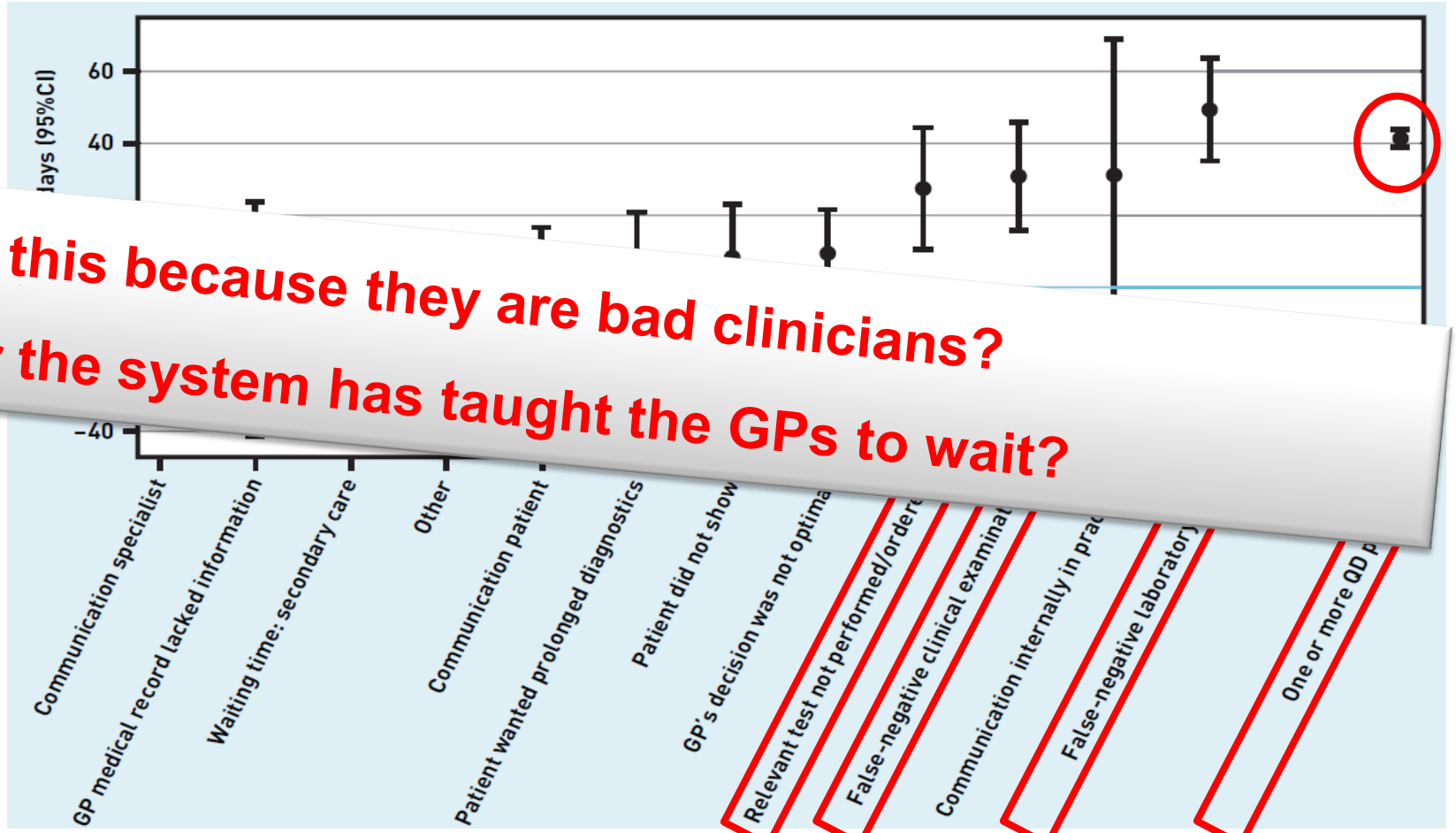
How do GPs evaluate the diagnostic pathway

GPs reported quality deviation in 30% of pathways they were involved in



Is this because they are bad clinicians?

Or the system has taught the GPs to wait?

Jensen H, et al. Quality deviations in cancer diagnosis - prevalence and time to diagnosis. BJGP 2013

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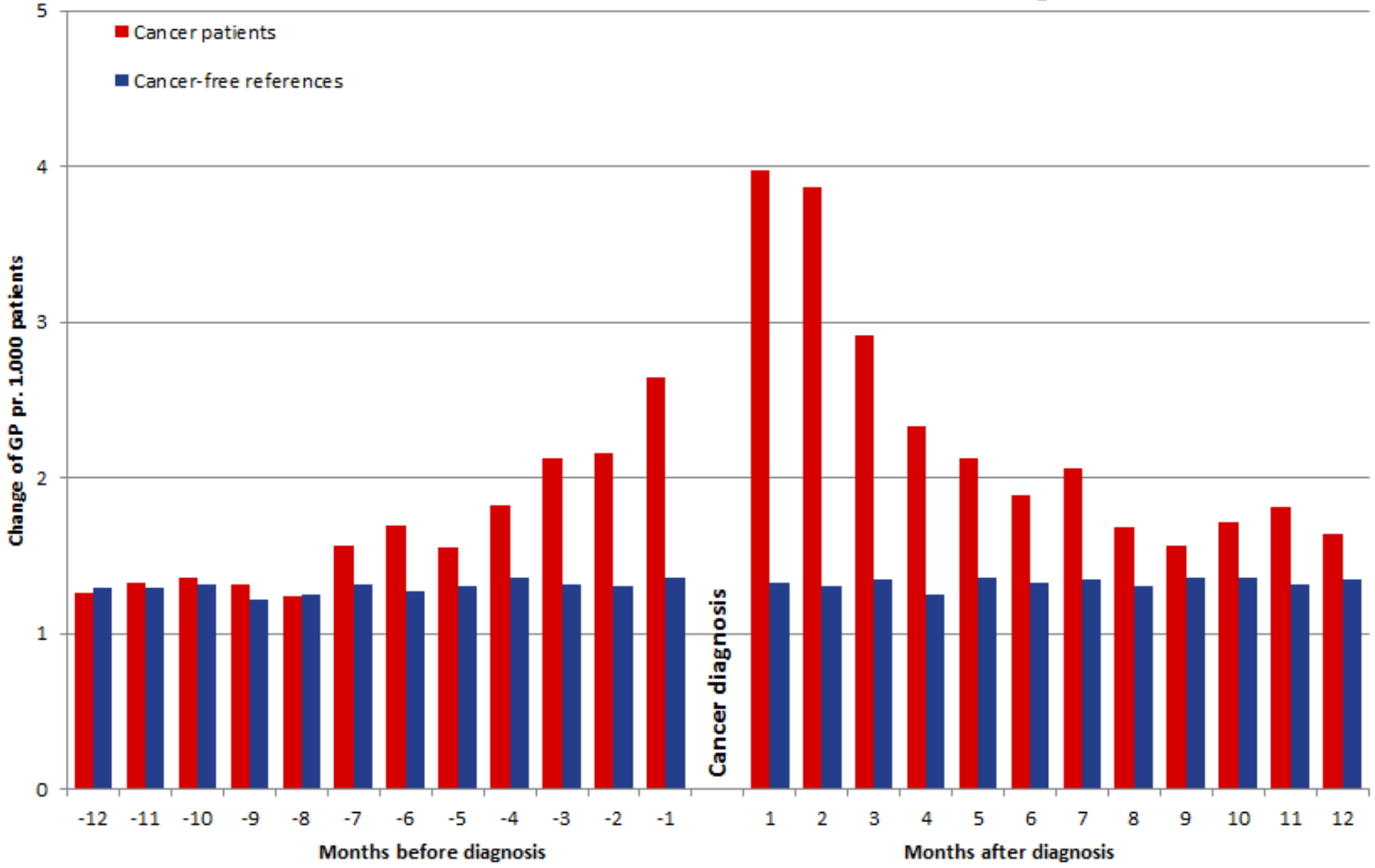
It means a lot to patients…

Active disenrollment from GP's patient list



Jeppesen KG, et al. Under preparation

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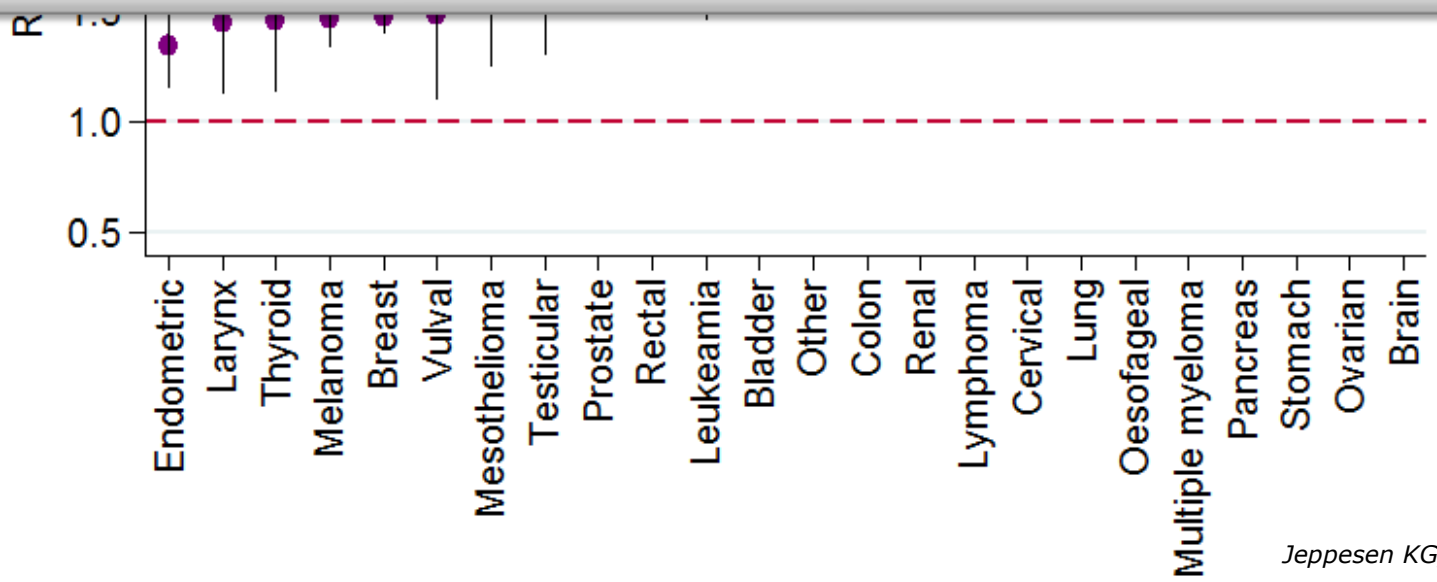
It means a lot to patients

Is this due to the clinical difficulties for some cancers?

Or a lack of access to investigations when symptoms are not clearly indicative of cancer?



Jeppesen KG, et al. Under preparation

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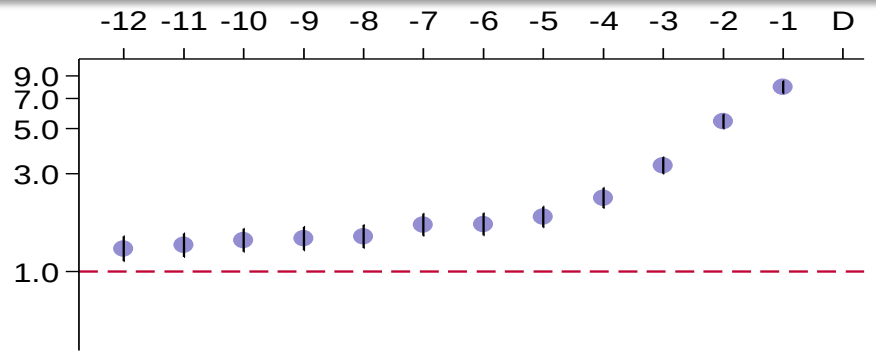
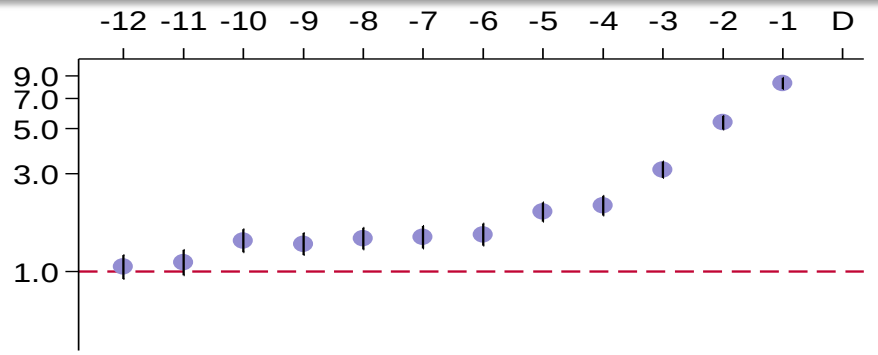
Pre-diagnostic activity – colorectal cancer

Measuring haemoglobin in general practice

Women



Men



What if the GPs had access to relevant investigations?

Hansen P, et al. IJC 2015

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Urgent referral to Diagnostic Centre (n=1200)

The GP's gut-feeling and risk of cancer

	Risk of cancer
Very much	34.0%

Do we trust a GP's specialist nose?

Is the healthcare system responsive when symptoms are not indicative of cancer?

Ingeman ML, et al. Submitted 2015

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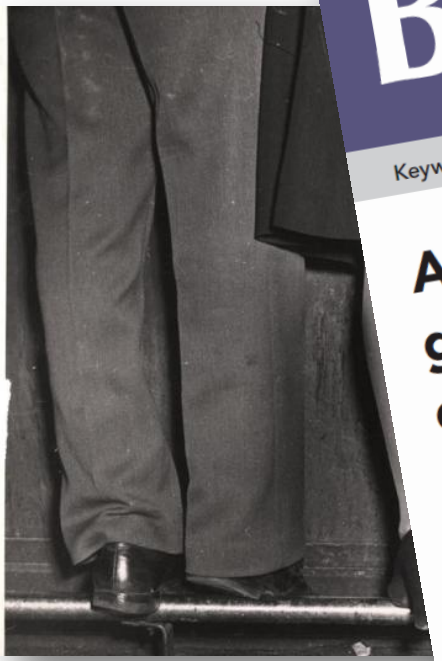
Acknowledge the 3 groups of symptoms!

Symptom group	%
Alarm symptom	50
Serious, non-specific	20
Common	30

Jensen H, et al. BMC Cancer 2014;14:636

Funded by: Danish Cancer Society | The Novo Nordisk Foundation novo nordisk fonden

The 3-legged strat… …gnosis



…er

(the difficult)

BJC

British Journal of Cancer (2015), 1–5 | doi: 10.1038/bjc.2015.44

FULL PAPER

Keywords: Denmark; diagnosis; health services organisation; access; investigation

A differentiated approach to referrals from general practice to support early cancer diagnosis – the Danish three-legged strategy

P Vedsted*,[1] and F Olesen[1]

[1]Research Unit for General Practice, The Research Centre for Cancer Diagnosis in Primary Care (CaP), Institute of Public Health, Aarhus University, Bartholins Alle 2, 8000 Aarhus C, Denmark

Abstract: When aiming to provide more expedited cancer diagnosis and treatment of cancer at an earlier stage, it is important to take into account the symptom epidemiology throughout the pathway, from first bodily sensation until the start of cancer treatment. This has implications for how primary-care providers interpret the presentation and decisions around patient management and investigation. Symptom epidemiology has consequences for how the health-care system might best be organised. This paper argues for and describes the organisation of the Danish three-legged strategy in diagnosing cancer, which includes urgent referral pathways for symptoms suspicious of a specific cancer, urgent referral to diagnostic centres when we need quick and profound evaluation of patients with nonspecific, serious symptoms and finally easy and fast access to 'No-Yes-Clinics' for cancer investigations for those patients with common symptoms in whom the diagnosis of cancer should not be missed. The organisation of the health-care system must reflect the reality of symptoms presented in primary care. The organisational change is evaluated and monitored with a comprehensive research agenda, data infrastructure and education.

In recent years, many health-care systems have implemented specific strategies to ensure timely cancer diagnosis (Department of Health, 2000; Prades *et al*, 2011). This has been motivated by poor cancer control, public discontent with long waiting times and an symptoms, the GP can suspect cancer and refer urgently to a specific pathway, and the speed and logistics of the diagnostic pathway and the standardisation of treatment within the hospital setting can be improved (Toustrup *et al*, 2011; Vallverdú-Cartié

Vedsted, Olesen. A differentiated … Danish three-legged strategy. BJC. 2015

1 - Urgent referral is effective but…

- **Urgent referral for cancer suspicion**
  - Has given shorter diagnostic intervals

- **For those 40% diagnosed through urgent referral**
- **60% are not diagnosed trough the expedited route!**

- *Jones R, et al. BMJ 2007;334;1040*
- *Meechan D, et al. BJGP 2012 DOI: 10.3399/bjgp12X654551.*
- *Elliss-Brookes, et al. BJC 2012, 1220–1226.*
- *Jensen H, et al. BMC Cancer 2014;*

2 - Urgent referral to diagnostic centres

- **If the GP cannot allocate the patient to a specific route**
- **The GP performs a filter function:**
  - Imaging and blood samples within 2 days
  - If no explanation, then referral and seen within 2 days
- **A multidisciplinary team of specialists at hospital**
- **Outpatient 'pit-stop'**

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3 - Direct access to investigations

- **Implemented as 'No-Yes-Clinics' (NYC)**
- **GPs have direct access to expedited investigations**
  - Ultrasonic investigation of abdomen, pelvis, CT, endoscopy etc.
- **The GP is fully responsible**
- **No record, history taking etc. at clinic – <u>only a No or a Yes!</u>**

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Direct access to low-dose CT scan

- Direct access gave no difference in use of CT scans
- 22 pulmonary specialist hours saved per 100 patients referred
- 0.2 CT scans / 1000 listed / month
- 50% needed additional investigation
- 2.3% had a lung cancer

OPEN ACCESS Freely available online

PLOS ONE

Implementing Direct Access to Low-Dose Computed Tomography in General Practice—Method, Adaption and Outcome

Louise Mahncke Guldbrandt[1,2a], Torben Riis Rasmussen[3], Finn Rasmussen[4], Peter Vedsted[1]

1 Research Centre for Cancer Diagnosis in Primary Care, Research Unit for General Practice, Aarhus University, Aarhus, Denmark, 2 Section for General Medical Practice, Department of Public Health, Aarhus University, Aarhus, Denmark, 3 Department of Respiratory Diseases and Allergy, Aarhus University Hospital, Aarhus, Denmark, 4 Department of Radiology, Aarhus University Hospital, Aarhus, Denmark

Abstract

Background: Early detection of lung cancer is crucial as the prognosis depends on the disease stage. Chest radiographs has been the principal diagnostic tool for general practitioners (GPs), but implies a potential risk of false negative results, while computed tomography (CT) has a higher sensitivity. The aim of this study was to describe the implementation of direct access to low-dose CT (LDCT) from general practice.

Methods: We conducted a cohort study nested in a randomised study. A total of 119 general practices with 266 GPs were randomised into two groups. Intervention GPs were offered direct access to chest LDCT combined with a Continuing Medical Education (CME) meeting on lung cancer diagnosis.

Results: During a 19-month period, 648 patients were referred to LDCT (0.18/1000 adults on GP list/month). Half of the patients needed further diagnostic work-up, and 15 (2.3%, 95% CI: 1.3–3.8%) of the patients had lung cancer; 60% (95% CI: 32.3–83.7%) in a localised stage. The GP referral rate was 61% higher for CME participants compared to non-participants.

Conclusion: Of all patients referred to LDCT, 2.3% were diagnosed with lung cancer with a favourable stage distribution. Half of the referred patients needed additional diagnostic work-up. There was an association between participation in CME and use of CT scan. The proportion of cancers diagnosed through the usual fast-track evaluation was 2.2 times higher in the group of CME-participating GPs. The question remains if primary care case-finding with LDCT is a better option for patients having signs and symptoms indicating lung cancer than a screening program. Whether open access to LDCT may provide earlier diagnosis of lung cancer is yet unknown and a randomised trial is required to assess any effect on outcome.

Trial Registration: Clinicaltrials.gov NCT01527214

Dan Med J 60/12 December 2013 DANISH MEDICAL JOURN

Reduced specialist time with direct computed tomography for suspected lung cancer in primar

Louise Mahncke Guldbrandt[1,2], Morten Fenger-Grøn[1], Birgitte Holst Folkersen[3], Torben Riis Rasmussen[3] & Peter Vedsted[1]

ABSTRACT

INTRODUCTION: Lung cancer (LC) is the most common cause of cancer death in Denmark, and triaging patients through fast-track diagnostic pathways is recommended to improve patient outcome. Data on the most efficient triage organisation of such pathways are limited. The aim of this study was to test a strategy of a straight-to-test model for patients referred to the fast-track pathway. Outcomes were number of computed tomographies (CT) performed, use of specialist time and staff acceptability.

MATERIAL AND METHODS: We performed a randomised controlled study enrolling 493 patients who were referred from general practice to fast-track LC evaluation (1 January-1 December 2012). Half of the patients were randomly assigned to the intervention and went straight to a chest CT before chest-physician evaluation. Time was measured for patients at random days. Acceptability was examined in a

scheme was that a specialist should see the patient before initiation of basic investigations. However, as general practitioners (GPs) are already gatekeepers to specialised care, this could be considered a "double gatekeeping system" which may cause inefficiency and delay. Thus, the remaining question is whether patients should go straight to investigation or first pass a specialist on their way.

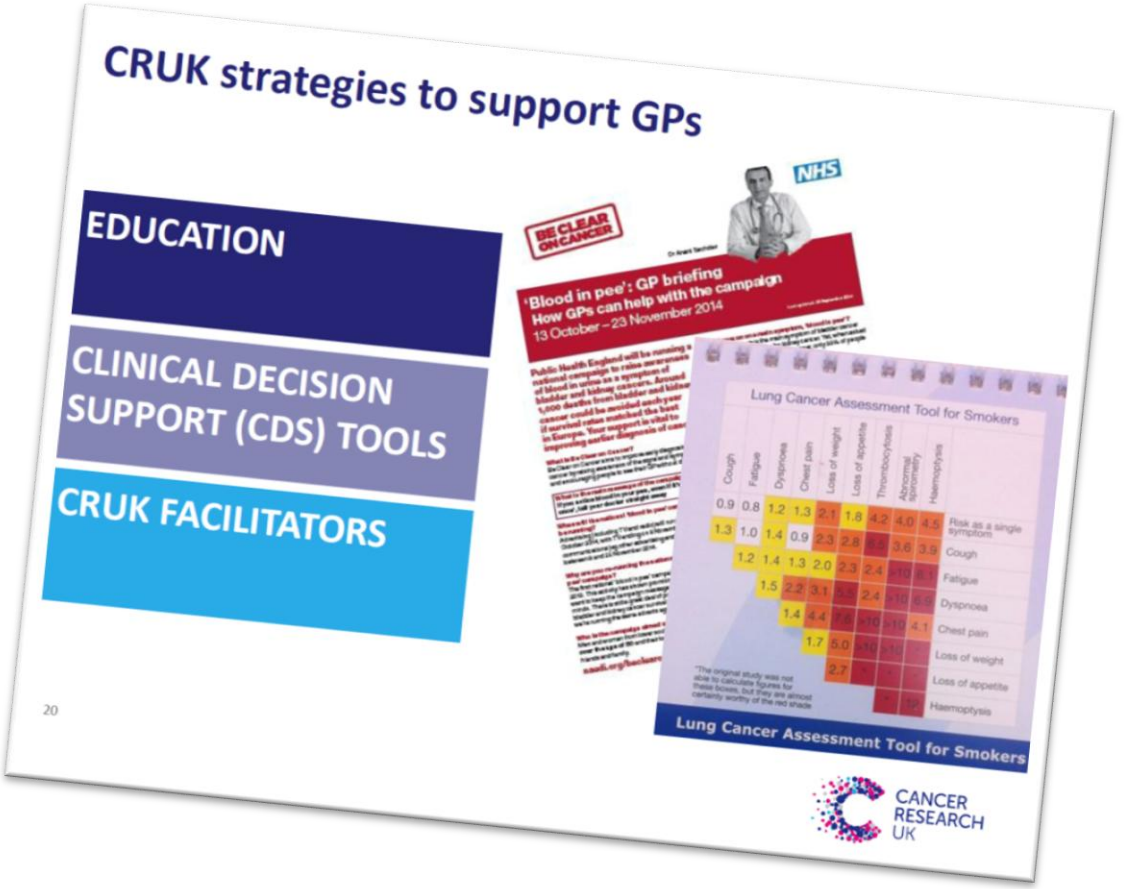
In Denmark, lung cancer comprises approx. 12% of all new cancer cases [2]. Mortality from lung cancer is largely determined by the stage at diagnosis. If a GP has "reasonable suspicion" that the patient has cancer, the GP can refer the patient through the fast-track system. For lung cancer, "reasonable suspicion" would be based on either a chest X-ray or alarm symptoms (e.g. haemoptysis). In general practice, these symptoms have a low positive predictive value [3], and many patients there-

General Practice, Aarhus University
2) Section for General Practice, Department of Public Health, Aarhus University
3) Department of Pulmonary Medicine, Aarhus University Hospital

Dan Med J 2013;60(12):A4738

Change the GPs or change the system?

- Increase the GPs' awareness
- Educate GPs in how to use the system correctly
- Develop indicators of GP performance
- But what if it is the health system that is poorly functioning?



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Some ‘inborn errors of metabolism’

- **Urgent referral for cancer suspicion is the solution**
  - ***No, less than half of the problem – it’s not the reality***
- **The GP can suspect cancer based in a list of symptoms and signs**
  - ***Other symptoms can wait and we do not trust “gut-feeling”!***
- **We focus on the cancer type and not on the symptoms**
  - ***GPs see symptoms and patients, - not cancers!***
- **Empower the patients to navigate correctly**
  - ***Do patients know? Equality? Anxiety, barriers?***
- **Include specialists to check the GP’s work (double gatekeeping)**
  - ***‘We get too many referrals and only 30% have cancer’***

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BJC

British Journal of Cancer (2015), 1–8 | doi: 10.1038/bjc.2015.47

Keywords: neoplasm; diagnosis; missed opportunities; patient safety; general practice; system factors; errors; quality

Understanding missed opportunities for more timely diagnosis of cancer in symptomatic patients after presentation

G Lyratzopoulos*[,1,2], P Vedsted[3] and H Singh[4]

[1]Health Behaviour Research Centre, Department of Epidemiology and Public Health, University College London, 1-19 Torrington Place, London WC1E 6BT, UK; [2]Department of Public Health and Primary Care, Cambridge Centre for Health Services Research, University of Cambridge, Institute of Public Health, Forvie Site, Robinson Way, Cambridge CB2 0SR, UK; [3]Department of Public Health, Research Unit for General Practice, Research Centre for Cancer Diagnosis in Primary Care (CaP), Aarhus University, DK-Bartholins Allé, 8000 Aarhus, Denmark and [4]Houston Veterans Affairs Center for Innovations in Quality, Effectiveness and Safety, Michael E. DeBakey Veterans Affairs Medical Center and the Section of Health Services Research, Department of Medicine, Baylor College of Medicine, Houston TX 77030, US

Abstract: The diagnosis of cancer is a complex, multi-step process. In this paper, we highlight factors involved in missed opportunities to diagnose cancer more promptly in symptomatic patients and discuss responsible mechanisms and potential strategies to shorten intervals from presentation to diagnosis. Missed opportunities are instances in which post-hoc judgement indicates that alternative decisions or actions could have led to more timely diagnosis. They can occur in any of the three phases of the diagnostic process (initial diagnostic assessment; diagnostic test performance and interpretation; and diagnostic follow-up and coordination) and can involve patient, doctor/care team, and health-care system factors, often in combination. In this perspective article, we consider epidemiological 'signals' suggestive of missed opportunities and draw on evidence from retrospective case reviews of cancer patient cohorts to summarise factors that contribute to missed opportunities. Multi-disciplinary research targeting such factors is important to shorten diagnostic intervals post presentation. Insights from the fields of organisational and cognitive psychology, human factors science and informatics can be extremely valuable in this emerging research agenda. We provide a conceptual foundation for the development of future interventions to minimise the occurrence of missed opportunities in cancer diagnosis, enriching current approaches that chiefly focus on clinical decision support or on widening access to investigations.

Good clinicians in a supportive health system

- We should continue educating good clinicians
- But not change the GPs so they fit into a poorly functioning system
- Try to make a supportive system acknowleding the reality of the GPs' clinical work
- And integrate primary and secondary care in making high quality cancer diagnostics

The 3-legged strategy for cancer diagnosis

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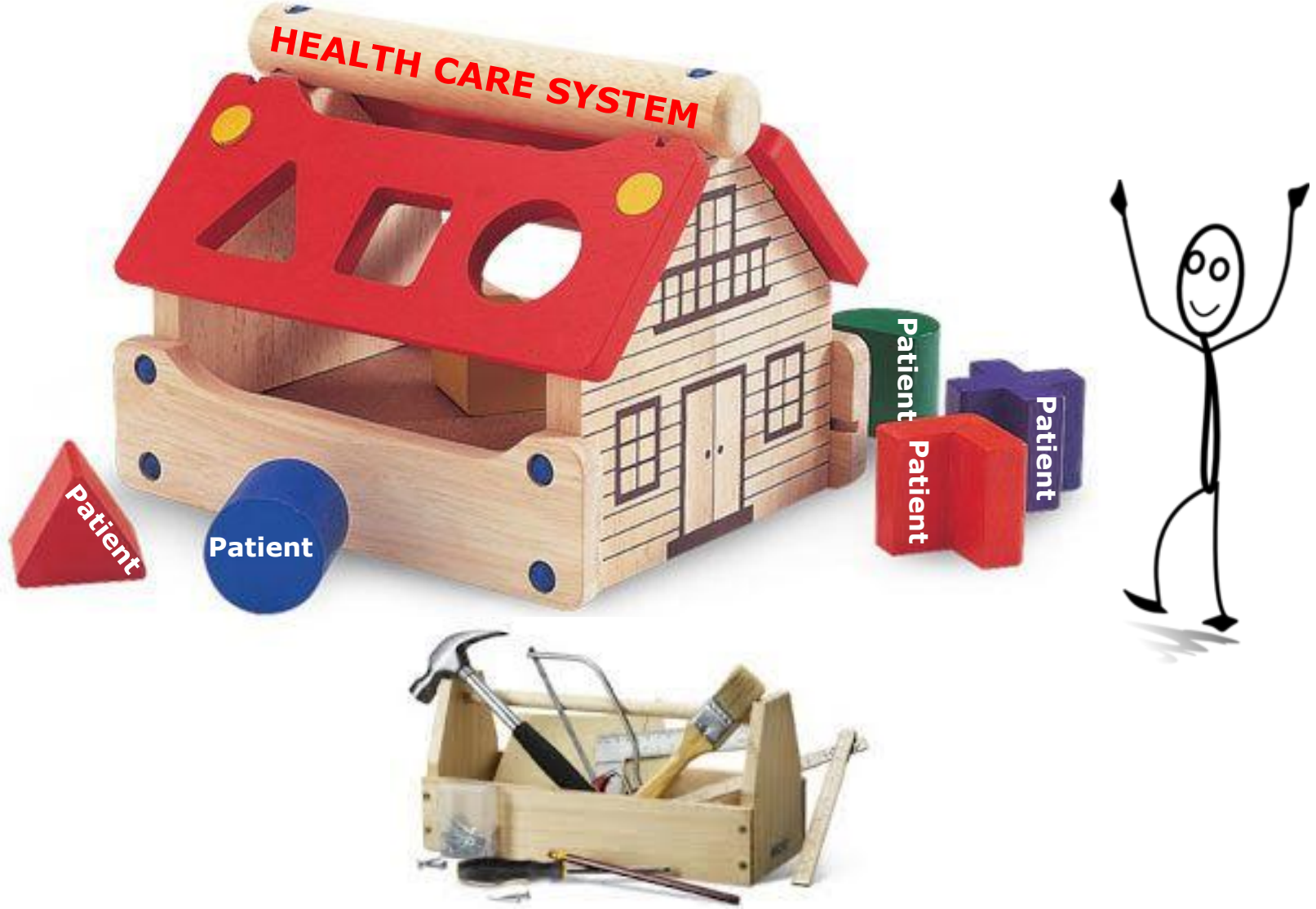
Thank you



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