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Evidence Brief: Role of the Annual Comprehensive Physical Examination in the Asymptomatic Adult

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PREFACE

Health Services Research & Development Service's (HSR&D's) Evidence-based Synthesis Program (ESP) was established to provide timely and accurate syntheses of targeted healthcare topics of particular importance to Veterans Affairs (VA) managers and policymakers, as they work to improve the health and healthcare of Veterans. The ESP disseminates these reports throughout VA.

HSR&D provides funding for four ESP Centers and each Center has an active VA affiliation. The ESP Centers generate evidence syntheses on important clinical practice topics, and these reports help:

- develop clinical policies informed by evidence,
- guide the implementation of effective services to improve patient outcomes and to support VA clinical practice guidelines and performance measures, and
- set the direction for future research to address gaps in clinical knowledge.

In 2009, the ESP Coordinating Center was created to expand the capacity of HSR&D Central Office and the four ESP sites by developing and maintaining program processes. In addition, the Center established a Steering Committee comprised of HSR&D field-based investigators, VA Patient Care Services, Office of Quality and Performance, and Veterans Integrated Service Networks (VISN) Clinical Management Officers. The Steering Committee provides program oversight, guides strategic planning, coordinates dissemination activities, and develops collaborations with VA leadership to identify new ESP topics of importance to Veterans and the VA healthcare system.

Comments on this evidence brief are welcome and can be sent to Nicole Floyd, ESP Coordinating Center Program Manager, at nicole.floyd@va.gov.

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INTRODUCTION

The routine annual comprehensive physical examination (PE) became a fixture in American medical practice in the 1940's. By the 1980's many influential professional groups, including the American Medical Association, the American College of Physicians, the United States Preventive Services Task Force (USPSTF) and the Canadian Task Force on Periodic Health, recommended that this approach be replaced by periodic screening, counseling and PE tailored to a patient's age, sex, risk factors, and symptoms as elicited by the medical history and review of systems (Oboler 2002). Furthermore, these recommendations tacitly or explicitly endorse the concept that, for screening purposes, only those components of the PE that accurately and effectively detect conditions for which early diagnosis is known to lead to improved patient outcomes should be routinely offered.

Consistent with this tailored and evidence-based approach, Medicare currently offers a free initial "Welcome to Medicare" visit which includes a medical history, recommended immunizations and screenings and "further tests depending on your health and medical history". The only components of the PE recommended for everyone are measurement of blood pressure, vision, weight and height *(www.medicare.gov/welcometomedicare/visit.html)*.

Nevertheless, most adults in the US believe that annual comprehensive physical exams are important; a 2002 study showed that more than 90% endorse the value of routine examination of the heart, lungs, abdomen, reflexes and prostate (Oboler 2002). Moreover, as recently as 2005, many physicians also endorse the complete annual physical examination for a variety of reasons including perceived benefits to the physician-patient relationship, patient expectations for a yearly "physical," fear of malpractice litigation, and compensation (Frame 1995, Prochazka 2005). The purpose of this review is to determine whether the routine annual physical examination results in improved outcomes for asymptomatic adults.

OBJECTIVES

PRIMARY: To evaluate the value of the routine (e.g. annual) physical examination in asymptomatic average risk adults. Specifically, what components of the routine physical examination are currently recommended by high-quality evidence-based guidelines or reports.

SECONDARY: To determine if designating a specific visit for the provision of evidence-based preventive services (often referred to as a periodic health examination) increases the likelihood that patients will receive these services.

WE ONLY REVIEW COMPONENTS OF THE ACTUAL PHYSICAL EXAMINATION; WE DO NOT INCLUDE:

1. Screening and preventive interventions that consist of history taking and/or counseling (e.g. risk assessment and counseling for issues such as tobacco use, injury prevention, sun exposure, overweight) or that are not physical examination procedures (e.g. immunizations, colon cancer screening with colonoscopy, breast cancer screening with mammography, osteoporosis screening with DEXA scans, blood tests for cholesterol)

2. Physical examinations performed to further elucidate patient symptoms, risk factors or concerns

3. Physical examinations performed to meet insurance, disability, employment or participation in sports requirements

METHODS

For the primary objective, we included the common components of the routine physical examination (see tables 1 and 2). For each component we reviewed the most recent recommendations of the USPSTF. "For the USPSTF to recommend a service, the benefits of the service must outweigh the harms. The USPSTF focuses on maintenance of health and quality of life as the major benefits of clinical preventive services, and not simply the identification of disease" *(www.uspreventiveservicestaskforce.org/index.html* accessed August 31, 2011).

For components of the PE not included in the USPSTF recommendations, we first reviewed a comprehensive systematic review on this topic (Oboler and LaForce, 1989). This review was based on an extensive computerized search of the medical literature from 1966 through 1988, using key words body temperature, respiratory rate, heart rate, auscultation [abdomen, carotid artery, heart], palpation [abdomen, peripheral pulse, lymph node, spleen, liver], digital rectal examination, pulse, hearing tests, breast examination, lung percussion, muscle stretch reflex; and terms for routine physical examination. Oboler and LaForce graded evidence as Grade I (evidence from at least one properly randomized controlled trial); Grade II (evidence from well-designed cohort or case-control studies; non-randomized controlled trials; or from "comparisons between times or places with or without the intervention" p. 215); Grade III (opinions of respected authorities or expert committees, evidence from other studies, or clinical experience).

To identify literature published since the Oboler and LaForce review, we conducted a computerized literature search of MEDLINE (1988 through August 2011) using the key words listed above. We limited the results to English language, human studies, adult patients, and meta-analysis or systematic reviews. Studies were considered eligible if they assessed clinical outcomes related to specific physical examination procedures in asymptomatic adults. We excluded articles that only described diagnostic accuracy. We also reviewed the 53 chapters of The Rational Clinical Examination, a compilation of articles from *JAMA* focusing on evidence-based clinical diagnosis (Simel 2009); and current VA/DoD Clinical Guidelines *(www.healthquality.va.gov)*.

For the secondary objective, we identified a systematic review which had surveyed the literature through 2004 (Boulware 2007). To update this, we performed a MEDLINE search from 2004 through August 2011 using the same key words (e.g. physical examination, yearly, annual, periodic, multiphasic screening, preventive health services) limited to English language, human studies, adult patients and to meta-analyses or systematic reviews.

RESULTS

PRIMARY OBJECTIVE: *To evaluate the value of the routine (e.g. annual) physical examination in asymptomatic adults. Specifically, what components of the routine physical examination are currently recommended by high-quality evidence-based guidelines.*

As shown in the figure our search produced 389 abstracts of which 10 met preliminary eligibility criteria and were retrieved for full article review. Three of these contained relevant information and were included along with 8 additional articles identified by a hand search of the bibliographies of key articles.

USPSTF Recommendations (table 1): Of the components of the physical examination evaluated by the USPSTF, 3 are currently recommended (blood pressure every 2 years, weight, and PAP smear for sexually active women with a cervix every 3 years up to age 65); 5 are recommended against (pelvic examination for ovarian cancer; PAP smear for women age > 65 who have had adequate screening in the past, women without a cervix or age < 21; testicular examination for testicular cancer; abdominal examination for pancreatic cancer; and thyroid examination for thyroid cancer); and for 4 there is insufficient evidence to make a recommendation either for or against (mouth examination for oral cancer, screening for hearing loss in adults over age 50, whole body skin examination for skin cancer, clinical breast examination for cancer, and eye exam for either visual loss or glaucoma).

An additional 4 components (carotid artery auscultation for carotid artery stenosis, peripheral pulse palpation for peripheral vascular disease, lung auscultation for chronic obstructive pulmonary disease and abdominal palpation for abdominal aortic aneurysm) were not explicitly evaluated by the USPSTF. However, in its reviews of laboratory screening tests for these conditions, these PE components were designated not useful (table 1).

Other Recommendations (table 2): For components of the PE not addressed by the USPSTF, we looked for recommendations in other sources (see methods). Several elements of the PE (e.g. musculoskeletal examination and examination of the legs for edema) were not covered in any of these sources.

Recommended. Oboler and LaForce (1989, p. 219) recommended heart auscultation once at the first adult exam and then again at age 60 for detection of valvular disease. However, the JAMA Rational Clinical Examination states that there are no data on indications for auscultation for systolic murmurs (Simel 2009 p. 443). Measurement of pulse to screen for atrial fibrillation in adults over age 65 is recommended by at least one source (Fitzmaurice 2007).

Not Recommended. Lymph node palpation, heart auscultation for detection of coronary artery disease or atrial fibrillation, palpation of liver and spleen for hepato-splenomegaly, assessment of spine mobility for risk of back pain, testing of peripheral reflexes and sensation for neuropathies, and abdominal auscultation for renovascular hypertension were not recommended by Oboler and LaForce (Oboler 1989).

Insufficient Evidence. Digital rectal exam for prostate or rectal cancer; and measurement of temperature and respiratory rate were deemed by Oboler and LaForce to have insufficient evidence on which to base a recommendation.

Comments on Selected Physical Examination Components:

Screening for Hearing Loss. The USPSTF has determined that there is insufficient evidence for this procedure for adults above 50 (see table 1). However, a randomized trial in veterans over age 50 assessed the efficacy of immediate hearing aids versus wait list in individuals with hearing loss detected either by screening (hand held audiometric device) or because of patient-reported hearing problems. Compared to the wait list group, the immediate hearing aid group had sustained improvements in hearing related communication measures and small but statistically significant improvements in depression and cognitive scores. Results were similar in the screen detected and the symptomatic group (Yueh 2010).

Digital Rectal Examination (DRE). The evidence for performing a DRE for screening for either rectal or prostate cancer was deemed to be insufficient by Oboler and LaForce (table 2). No studies have assessed the benefits and harms of the DRE for colorectal cancer (CRC) screening and no major organization (VA, USPSTF, American College of Physicians, American Cancer Society) recommends it. The 2008 USPSTF recommendations evaluated several procedures for CRC screening. The DRE was not considered as an option.

Currently, the majority of prostate cancers are found by screening with the prostate specific antigen (PSA) test, which has been given an "insufficient evidence" rating by the USPSTF for men younger than 75 years of age and a recommendation against screening for men age 75 years and older. No screening or treatment trials have adequately assessed the benefits and harms of the DRE for prostate cancer screening in the absence of other procedures (i.e. PSA testing). Moreover, no screening trials, most of which relied primarily on PSA testing, have shown a reduction in prostate cancer or overall mortality. One randomized screening trial in the US specifically included annual DRE with PSA testing. Among men assigned to 6 annual rounds of PSA screening that included 4 rounds of DRE there was no reduction in prostate cancer mortality through 10 years of follow-up compared to men assigned to usual care (Andriole 2009).

Clinical Breast Examination (CBE). The current evidence is insufficient to assess the additional benefits and harms of CBE beyond screening mammography in average risk women age 40 and older (table 1). However according to the USPSTF indirect evidence "suggests that CBE may detect a substantial proportion of breast cancers if it is the only screening test available" and should be considered by the clinician in high risk patients (e.g. genetic mutations BRAC1, BRAC2, history of chest radiation) or if mammography is either not available or refused by the woman (*www.uspreventiveservicestaskforce.org/uspstf09/breastcancer/brcanrs.htm* accessed Aug 31, 2011).

Auscultation of Carotid Arteries. The USPSTF recommended against screening for asymptomatic carotid artery stenosis (table 1). This recommendation focused on screening to determine need for carotid endarterectomy. However, some clinicians may auscultate the carotid arteries for bruits to further assess cardiac risk in patients who are not high risk by conventional criteria (e.g. Framingham Risk Score) to determine whether to initiate preventive interventions such as aspirin or statins. It should be noted, however, that the USPSTF concluded in 1996 that cartotid artery auscultation had poor reliability and sensitivity for detection of bruits.

Abdominal Palpation. The USPSTF recommends one time screening for abdominal aortic aneurysm (AAA) with ultrasonography in men aged 65 to 75 who have ever smoked (table 1).

They comment that abdominal palpation has poor accuracy and is not an adequate screening test for AAA. As noted above the USPSTF recommends against abdominal palpation for pancreatic cancer screening. Oboler and LaForce do not recommend palpation of the liver and spleen for hepato-splenomegaly (1989).

SECONDARY OBJECTIVE: *To determine if designating a specific visit for the provision of evidence-based preventive services (often referred to as a periodic health examination) increases the likelihood that patients will receive these services.*

A 2007 systematic review that included 33 studies published between 1973 and 2004 investigated the benefits of the periodic health evaluation (PHE) (Boulware 2007). As shown in the figure, our updated search yielded 912 abstracts which we reviewed; 4 were retrieved for full article review (Robertson 2008, Milone 2006, Dubey & Glazier 2006, Dubey & Mathew 2006). However, since none of these 4 addressed our specific question, the summary below is based exclusively on the Boulware paper, a high quality review performed under the auspices of the Evidence Based Practice Center Program of the Agency for Healthcare Research and Quality.

Boulware et al. defined the PHE as "one or more visits with a health care provider for the primary purpose of assessing patients' overall health and risk factors for disease that may be prevented by early intervention...[The] definition specified the PHE as consisting only of the history, risk assessment and a tailored physical examination" (p. 291). This was compared to "opportunistic" provision of recommended services, i.e. during visits for management of chronic disease or acute illness. Recommended preventive services included components of the physical examination as well as screening tests, counseling, and immunizations.

Of the 33 studies included in this review, 21 were identified by the authors as constituting "the best available evidence". Seventeen outcomes were assessed in these studies. Results suggested that the PHE "had a consistently beneficial association with patient receipt of gynecological examinations and PAP smears, cholesterol screening, and fecal occult blood testing" (Boulware 2007, p.289). One trial found that the PHE was associated with less patient worry. There were no consistent associations between the PHE and any of the other 13 outcomes evaluated (counseling, immunizations, mammography, disease detection, health habits**,** health status, blood pressure, body mass index, cholesterol levels, costs, disability, hospitalization and mortality). Although the authors concluded that the review provided "health care providers and payers justification for the continued implementation of the PHE" (Boulware 2007, p. 297), we are not convinced that this conclusion is fully supported by the data. Specifically we are concerned about the potential for reporting bias and chance positive findings and, most importantly, that benefit was found for only 4 of the 17 selected outcomes. Furthermore, given that this review was based on data obtained before the era of the electronic medical record (EMR), it is likely that the reminder capabilities of the EMR may obviate the need for designating a specific visit to ensure delivery of recommended preventive services.

Other Considerations and Limitations: We did not specifically review specialty society recommendations although if published in the medical literature they should have been detected by our search. Second, we linked each component of the PE to a specific purpose (e.g. whole body skin examination *to detect* skin cancer). There might be other reasons to perform a specific examination, although these would generally be for symptom evaluation, which is outside the

scope of this review. Finally, several authors point to the intangible benefits of the physical examination, or "laying on of hands", such as strengthening the patient-physician relationship and conveying a sense of caring (Oboler 1989, Prochzka 2005, Frame 1995, Verghese 2009). However, we are unaware of any empirical studies evaluating these hypothesized benefits.

CONCLUSIONS

- Comprehensive routine physical examinations are not recommended for the asymptomatic adult, although many patients and physicians continue to endorse the practice.
- Components of the physical examination recommended for the asymptomatic adult include:
    - blood pressure screening every 1-2 years
    - periodic measurement of body mass index
    - PAP smears beginning at age 21 for sexually active women with a cervix every 3 years up to the age of 65.
- There is some evidence that designating a specific visit for the provision of preventive services may increase the likelihood that patients will receive PAP smears, cholesterol screening and fecal occult blood testing.

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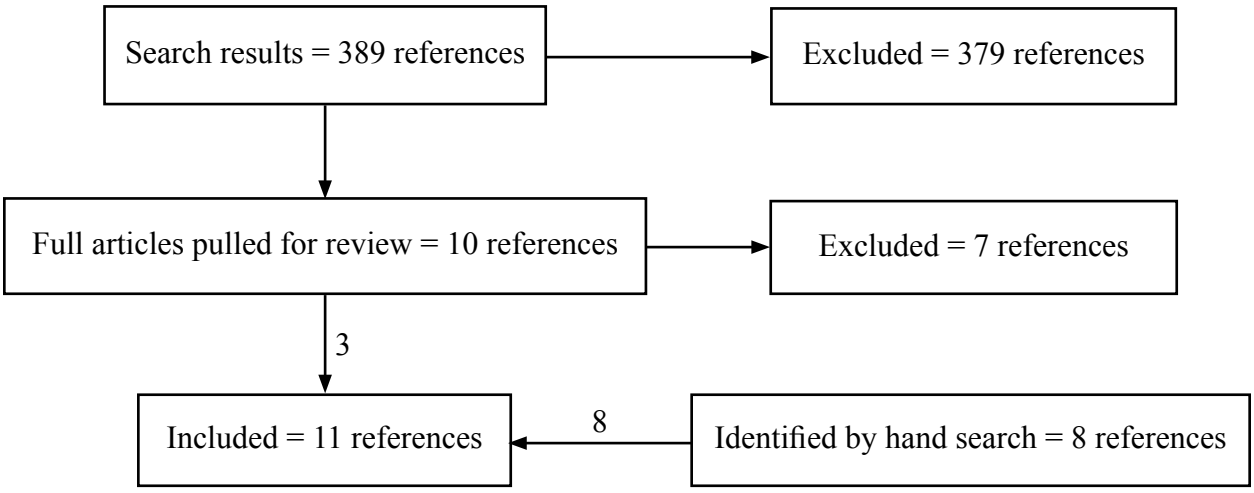
Figure: Search Strategies

Objective #1



Objective #2

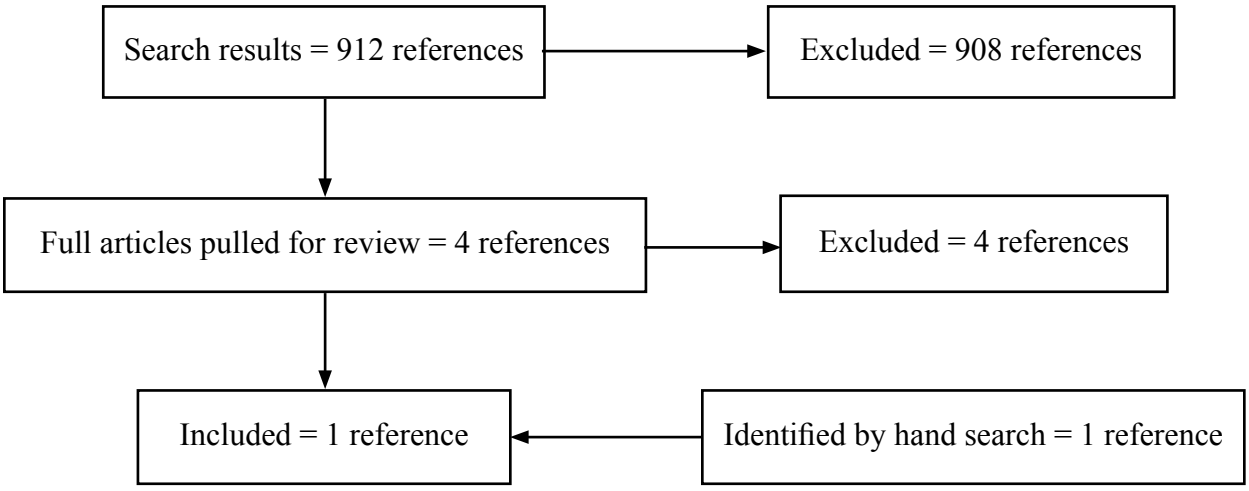


Table 1. United States Preventive Services Task Force (USPSTF) Recommendations for Physical Examination Procedures for Average Risk Asymptomatic Adults

Procedure	To detect…	Grade[#]	Year	Comments
RECOMMENDED				
Blood Pressure (BP)	Hypertension	A	2007	For adults age 18 or older. There is no evidence on which to base a recommendation for optimal interval. The Joint National Committee on Prevention Diagnosis and Treatment of High Blood Pressure recommends every 2 years in persons w/ initial BP < 120/80 and every year in persons with BP 120-139 or diastolic 80-89. VA/DoD guideline (2004) recommends annual
Weight (Body Mass Index)	Obesity*	B	2003	Frequency not specified; VA/DoD guideline (2006) recommends annual
PAP smear	Cervical cancer*	A	2003	For women with a cervix every 3 years beginning within 3 yrs of onset of sexual activity or age 21 whichever comes first.
Recommend AGAINST				
PAP smear	Cervical Cancer*	D	2003	For women without a cervix or women over age 65 if they have had adequate screening in the past and are not at high risk of cervical cancer.
Pelvic examination	Ovarian cancer*	D	2004	
Testicular examination	Testicular cancer	D	2011	
Abdominal palpation	Pancreatic cancer	D	2004	
Thyroid examination	Thyroid Cancer*	D	1996	"May contain information that is out of date" per USPSTF website accessed 8/31/11
INSUFFICIENT EVIDENCE				
Mouth examination	Oral cancer*	I	2004	Either for average or high risk (ie > age 50 who use tobacco) adults
Whole body skin examination	Skin Cancer	I	2009	Applies to general adult population. Does not apply to patients with a history of malignant or pre-malignant lesions or with familial syndromes associated with high risk.
Breast examination	Breast Cancer	I	2009	Insufficient evidence to recommend *as an additional test* for women who receive recommended mammography; see text page 4
Eye examination	Impaired visual acuity	I	2009	For adults age 65 or older. Tests included Snellen eye chart, Amsler grid and/or fundoscopy to detect age-related macular degeneration or cataracts Insufficient evidence that vision screening improves functional outcomes
	Glaucoma*	I	2005	Tests included Visual field exam, intraocular pressure and fundsocopic exam
Hearing Examination	Hearing Loss*	I	2011	For adults age 50 or older.
Not Rated				
Carotid artery auscultation	Carotid artery stenosis	NR	2007	Grade D for Ultrasound, Magnetic Resonance Angiography and Digital Subtraction Angiography JAMA Rational Clinical Exam (Simel 2009): "there are still no data that assess the effect of screening for an asymptomatic bruit"; see text page 4

Procedure	To detect…	Grade[#]	Year	Comments
Peripheral pulse palpation	Peripheral vascular disease	NR	2005	Grade D for screening w/ Doppler blood pressures which have "better accuracy than palpation of peripheral pulses"
Lung auscultation	Chronic obstructive pulmonary disease	NR	2008	Grade D for screening spirometry; "good evidence that clinical examination is not an accurate predictor of airflow limitation"; JAMA Rational Clinical Exam (Simel 2009) states that no single component of the PE can rule in or rule out airflow obstruction and none could accurately assess severity of airflow obstruction
Abdominal palpation	Abdominal aortic aneurysm	NR	2005	Grade B for one time screening by ultrasound in men age 65-75 who have ever smoked. Screening by ultrasound is superior to abdominal palpation which has poor accuracy. See text p. 4

[#] Grades A and B: Service should be offered or provided; Grade D: Use of this service should be discouraged; Grade I: Insufficient evidence to make a recommendation; NR: not rated; *Screening recommendations for these conditions are currently being updated by the USPSTF;
USPSTF recommendations from website accessed August 31, 2011 (http://www.uspreventiveservicestaskforce.org)
VA/DoD recommendations from website accessed September 8, 2011 (http://www.healthquality.va.gov)

Table 2. Physical Examination Procedures Not Evaluated by the USPSTF (for Average Risk Asymptomatic Adults)

Procedure	To detect…	Recommendation/Comments	Sources
RECOMMENDED			
Pulse	Atrial fibrillation	May be useful in adults over age 65	Fitzmaurice 2007
Heart auscultation	Valvular disease	Recommended once at first adult exam and then once again at age 60*	Oboler and LaForce 1989
		No data on indications for auscultation for systolic murmurs	JAMA Rational Clinical Exam (Simel and Rennie, 2009)
NOT RECOMMENDED			
Lymph node palpation	Malignancy	Not recommended	Oboler and LaForce 1989
Heart auscultation	Coronary artery disease	Not recommended	Oboler and La Force 1989
	Atrial fibrillation	Not recommended	Oboler and LaForce 1989
Spleen/Liver palpation	Hepato-splenomegaly	Not recommended	Oboler and LaForce 1989 JAMA Rational Clinical Exam (Simel and Rennie, 2009)
Assessment of spine mobility	Risk for low back pain	Not recommended	Oboler and LaForce 1989
Reflexes and sensation	Peripheral neuropathy	Not recommended	Oboler and LaForce 1989
Abdominal auscultation for bruit	Renovascular hypertension	Not recommended	JAMA Rational Clinical Exam (Simel and Rennie, 2009)
INSUFFICIENT EVIDENCE			
Digital rectal exam	Prostate or rectal cancer	Insufficient evidence, see also text page 3	Oboler and LaForce 1989
Temperature/Respiratory rate	Fever, tachypnea	Insufficient evidence	Oboler and LaForce 1989

*This recommendation is based on evidence from well designed cohort or case-control studies or controlled trials without randomization (Grade II, Oboler and LaForce, 1989, p. 215).