

Volume 5 Issue 4 April 2021

## Upgrading Bedside Skills - A Must in Caring for the Elderly

## Jochanan E Naschitz\*

Professor, Bait Balev Nesher, Department of Geriatric and Palliative Care, and The Ruth and Bruce Rappaport Faculty of Medicine, Technion, Israel Institute of Technology, Haifa, Israel

\*Corresponding Author: Jochanan E Naschitz, Professor, Bait Balev Nesher, Department of Geriatric and Palliative Care, and The Ruth and Bruce Rappaport Faculty of Medicine, Technion, Israel Institute of Technology, Haifa, Israel. Received: February 12, 2021 Published: March 19, 2021 © All rights are reserved by Jochanan E Naschitz.

## Abstract

While standard clinical evaluation is appropriate in most adult populations, it is likely to miss some common problems in elderly patients such as cognitive impairment, immobility, instability, incontinence, elder neglect, mistreatment, and abuse. The present review outlines some major issues in the examination of elderly patients: key points in obtaining the patient history, differences in reading vital signs of elders as compared to younger adults, particulars in geriatric physical examination, conditions amenable to diagnosis on first glance, the role and limitations of laboratory tests, computer interpreted electrocardiogram, bladder ultrasound, chest X-rays, 'comprehensive geriatric assessment', and diagnostic reasoning. Clinical pearls are put forward, backed by the author's experience. It is understood that no technology can replace the basic human-human interaction between patient and physician. **Keywords:** Clinical Evaluation; Imaging; Long-term Care Facilities (LTCF)

# Introduction

mistreatment, and abuse [1].

'The geriatric practice embodies principles of adult medicine and modifies these principles to accommodate changes related to aging' - this often used is truism is both accurate and persuasive. Indeed, while the standard clinical evaluation is reasonably appropriate in most adult populations, it tends to miss some of the common problems concerning elderly patients, such as cognitive impairment, immobility, instability, incontinence, elder neglect,

Many older people develop functional impairment and disability, necessitating either support at home or admission to long-term care services, rehabilitation centers, or hospices. The medical assessment of patients in long-term care facilities (LTCF) differs from that in hospital settings. With limited access to comprehensive laboratory and imaging technologies, it is the LTCF where bedside skills are of primary importance. An experienced physician may be able to recognize typical disease patterns at once, so shortcutting the diagnostic work-up. The impression of 'deja vue' may provide important clues to a diagnostic conundrum. While results of laboratory tests and diagnostic imaging may be of uncertain significance and are sometimes misleading, the experienced physician can make out whether these data are appropriate in the clinical context. On the other hand, the physician's experience, necessarily being selective and unbalanced, may produce bias and deception. Therefore, a quick first impression needs often to be supplemented by a second examination, a second impression, and a second thought.

Comprehension, compassion, and commitment are strongly wanted by patients and act reciprocally on the physician, preserving mindfulness and countering emotional exhaustion and burnout. No technology can replace the basic human-human interaction [2].

#### The patient history

Obtaining the medical history in elderly patients may be demanding, sometimes because of barriers existing to communication and often because of atypical presentations of illness and interference of comorbidities [3]. Elderly patients repeatedly present with a combination of nonspecific complaints or no complaint at all. Therefore, the reliability of the patient's account should be assessed, tactfully, during history taking. Families and care givers can provide corroboration of the medical history. This should be done even with the most credible patients. Pitfalls in history taking should be anticipated, such as the patient confusing illness with normal aging, denying illness, accepting illness as inevitable, fear of tests and medicines, or financial problems causing the patient avoiding contacting the physician.

Physicians should be aware to the possibility of atypical manifestations of diseases in the elderly [4,5]. Such are the presentation of sepsis with delirium, dyspnea or falls in the absence of fever; ischemic heart disease presenting with apathetic delirium and without chest pain; hypoglycemia presenting with sleepiness in the absence of signs of autonomic arousal; fecal impaction presenting with diarrhea or with delirium; orthostatic hypotension masked by supine hypertension; unrecognized postprandial hypotension mistaken for a habitual postprandial nap; adverse effects of medications confused with organic or functional disorders.

Obtaining clues of cognitive decline is an issue of major importance [6]. An initial step in the evaluation of a patient with suspected dementia should focus on interrogating persons who know the patient well and can provide an adequate history of cognitive and behavioral changes. Early manifestations of dementia may be impairment of the recent memory (the patient forgets what was heard or read, repeats himself, misplaces things), poor decisionmaking and poor problem-solving, difficulty in performing routine tasks or new tasks, problems with managing money or household, difficulties in word finding or in participating in conversation, getting lost in familiar areas, forgetting known routes while driving, change in behavior, personality, or mood. 108

Taking an account of the patient's medications is warranted. Patients and care givers should be encouraged to bring the medications for the physician's appraisal. This allows the physician to review the therapy. Specific inquiry about use of over-the-counter medicine and nutrient additives is mandatory, such as cannabis, glucosamine, ginseng, ginkgo balboa, garlic, saw palmetto, kava, valerian root [7]. Herbal medicines may interact with prescribed drugs. Feverfew, garlic, ginger, ginseng, motherwort, St John's wart, and willow bark reduce platelet aggregation. Interactions of ginkgo balboa with warfarin increase the risk of bleeding. St. John's wart taken with serotonin-reuptake inhibitors increases the risk of serotonin syndrome. Reviewing the patient's medication permits choosing therapies that optimize benefit, minimize harm, consider treatment burden, complexity, and fosters deprescribing of unnecessary medications [8].

Furthermore, the geriatric systems-review gives emphasize on falls, gait abnormalities, foot problems, nutrition, dental status, osteoporosis, pressure sores, psychiatric illness, sleep disorders, and hearing loss. Functional assessment should include the past and recent functional status. Living arrangements and dependence for assistance on family or others should be identified. Issues of abuse or neglect, caregiver stress, and advance directives should be reviewed.

#### Vital signs

Vital signs vary by age and should be interpreted accordingly.

A lower threshold of the febrile state for older persons has been proposed by The Clinical Practice Guideline 2008 for the Evaluation of Fever and Infection in Older Adult Residents of Long-Term Care Facilities [9]. In elderly persons, typically institutionalized, having multiple chronic morbidities and functional disabilities, fever is defined as a single oral temperature 37.8°C, or repeated oral temperatures 37.2°C, or rectal temperatures 37.5°C, or increase in temperature by 1.1°C over the baseline temperature. In patients with respiratory distress, oral temperature assessment should be avoided to eliminate the error caused by rapid mouth breathing. There is an ongoing dispute why should a person's body temperature be compared with an absolute standard temperature. Body temperature deviation from statistical mean can has origin in individual physiology. A temperature normal for one person might be pathologically elevated for another. Better insight is provided by analysis of mega data records of oral temperature [10]. The mean oral temperature was 36.6°C (99% range 35.3-37.7°C). Demographics, comorbidities and physiological measures collectively accounted for only 8.2% of variation from the baseline temperature. This data, however, is not representative for elderly patients with multimorbidity and frailty, and should not impact on current practice in the LTCF [10].

Appropriate measurement of the blood pressure (BP) requires adherence to guidelines, namely sitting in a chair with back support, proper cuff size and placement, patient's arm supported at heart level, patient's feet supported by the floor or a step stool, patient's legs not crossed, taking three consecutive measurements, the patient resting quietly for the duration of the measurements [11]. Inaccuracies of BP measurement may be due to inappropriate cuff size, presence of arrhythmias (causing the BP to be highly variable with multiple readings needed to increase accuracy), unexposed inter-arm BP differences, and interference by external noise. Inaccurate BP diagnosis may be due to missing orthostatic hypotension when measurements are obtained only with the patient supine, missing supine hypertension when all measurements are taken with the patient sitting (Figure 1), unawareness of BP decrease during an acute febrile illness (the need to taper down antihypertensive medications), BP overshoot after recovery from acute illness (up-titration of antihypertensive medications required).

Guidelines advise that the BP be measured on both arms, a recommendation is often ignored. Measuring BP on one arm may cause underdiagnosis of hypertension when a significant inter-arm BP difference exists [12]. Measuring BP over a thick sleeve may result in overestimation, but measuring over a thin sleeve has no significant impact and should be preferred to rolling the sleeve up [13]. There should be awareness of the inherent limitations of automatic BP devices and of possible errors in measurement. Automatic BP monitors are accurate in measuring the systolic BP but not diastolic BP in patients with atrial fibrillation [14].



**Figure 1:** Supine hypertension associated with orthostatic hypotension. The BP was measured at one minute intervals. With the patient seated the BP was within the normal range and the patient free of symptoms. In fact, the patient's sitting BP is consistent with orthostatic hypotension, exposed when high BP was measured with the patient lying down. Subsequently, when the patient was asked to stand an immediate drop in BP occurred as he lost consciousness.

The respiratory rate is often measured over a period shorter than 1 minute and then multiplied to produce a rate per minute. In fact, abnormal respiratory rates are more reliably detected with measurements made over a full minute, and short-cuts often fail to identify sick respiration patterns [15].

Estimation of the arterial oxygen saturation by pulse oximetry (SpO2) may be subject to errors. While in general, SpO2 90% corresponds to PaO2 60 mmHg, the relationship between the two measures depends on the body temperature, pH, PaCO2, and 2,3-diphosphoglycerate. In comparing ear and finger probes, readings from finger probes are more accurate. Pulse oximeters may fail to record accurately the SpO2 during severe or rapid desaturation, hypotension, hypothermia, dyshemoglobinemia, and low perfusion states, peripheral vasoconstriction, dark skin pigmentation, nail polish, dyshemoglobins (carboxyhemoglobin, methemoglobin), intravascular dyes, motion, and ambient light [16].

#### The physical examination

Physical examination is instantly available and may be very helpful. It should strive to be complete, even in patients who are uncooperative. Patients expect to be examined and are disappointed if this clinical ritual is omitted. One among many requirements on physical examination is not to transmit pathogens. The major mode of transmission is by transient carriage of nosocomial pathogens by the hand of health care workers having direct physical contact with patients. Hand hygiene for health care workers before and after direct patient contact is a must, now most often with a waterless alcohol gel or hand rub. Health care workers should also routinely decontaminate their stethoscope between examining patients by wiping the head of a stethoscope with a 70% alcohol or with the antiseptic used for hand hygiene [17]. It has long been known that the diaphragms and bells of stethoscopes are almost universally contaminated by potential nosocomial pathogens.

Minor manifestations of major disorders In the frail patient, major disorders can manifest with unimpressive or nonspecific changes of behavior, consciousness and appearance. It is the nurse or physician seeing the patient day by day and talking to the patient who can sense a change in the patient's condition and raise the 'red flag' signal. The best monitor, integral to physical examination, is seeing the patient and family frequently and talking with them. No consultation by telephone is substitute to the committed physician who is seeing the patient day-by-day.

#### **Diagnosis on first glance**

A skilled physician may be able to recognize typical disease patterns at once and thus expedite the diagnostic work-up. This may be critically important especially in acute bacterial infections.

Erysipelas is a superficial skin infection with lymphatic involvement, in most instances caused by group A streptococci. The diagnosis is based on the lesion's appearance on physical examination, while bacteriologic cultures are rarely positive. The main differential diagnoses are cellulitis, contact dermatitis, stasis dermatitis, and lymphoma cutis. Typical sites involved are the calf and less often the face. In unusual locations or involving the skin patchily (Figure 3) the diagnosis may be challenging [18].



Figure 2: Erysipelas of the left calf diagnosed in the appropriate clinical context.



**Figure 3:** Atypical erysipelas. Chills and fever preceded by 16 hours the appearance of a shining-red eruption on the patient's right leg (A).There was prompt improvement on amoxicillin treatment and 4 days later the eruption had disappeared (B).

Acute stasis dermatitis appears as a red, superficial, itchy plaque suddenly emerging on the lower leg on the background of chronic venous disease or chronic edema (Figure 4). It can easily be confused with erysipelas. Moreover, stasis dermatitis may be the first manifestation of venous insufficiency that has not been previously diagnosed. Differently from erysipelas the patient's general state is not affected at the time the eruption occurs, the body temperature is normal, stasis dermatitis often affects both calves while erysipelas typically is unilateral.



Figure 4: Acute stasis dermatitis of right calf on the background of bilateral chronic stasis dermatitis

Hot flushes, in distinction to erysipelas, are episodes of transient erythema, usually over the face, neck, ears, chest, and limbs due to vasodilatation mediated by neurogenic dysregulation or by vasodilators such as histamine, substance P, or prostaglandins. Also a flushed face may occur in polycythemia.

Chronic stasis dermatitis is an itchy rash confined to the lower legs of patients with venous disease or chronic edema of other causes, a poorly demarcated, scaly eruption that responds well to topical corticosteroid treatment. Secondary ulceration, cellulitis, post-inflammatory hyperpigmentation and progressive cutaneous hypertrophy can follow [19] (Figure 5).



**Figure 5:** Chronic stasis dermatitis complicated by cutaneous hypertrophy, the latter called elephantiasis nostras verrucose.

Ecthyma gangrenosum (Figure 6) is classically described as a cutaneous manifestation of Pseudomonas aeruginosa bacteremia.



Figure 6: Ecthyma gangrenosum.

Similar lesions may be caused by other bacteria or by fungi. Ecthyma gangrenosum usually occurs in patients who are critically ill and immune compromized. Fever begins a few days before the appearance of skin lesions. At onset, the skin lesions are well-circumscribed edematous plaques, rapidly becoming erythematous, hemorrhagic in the center, progressing to a bulla, and eventually to a black necrotic ulcer with an erythematous rim. The transformation of an early lesion into a necrotic ulcer may take only 12 hours. Ecthyma gangrenosum requires prompt diagnosis and antibiotic treatment. When therapy is delayed, the mortality ranges from 18% to 62%. The diagnosis is suspected based on the clinical appearance, which should immediately raise the possibility of bacteremia, particularly with P. aeruginosa, and should prompt the taking of blood cultures and culture of exudates from the lesion. Empiric antimicrobial therapy for the beginning should include an antibiotic with antipseudomonal activity, e.g. piperacillin-tazobactam [20].

Preseptal cellulitis, also called periorbital cellulitis, is an infection of the anterior layers of the eyelid not involving the orbit (Figure 7).

Eyelid swelling and erythema may be caused by bacterial infection. It is critical to distinguish preseptal cellulitis from orbital cellulitis because they have very different implications. Preseptal

Citation: Jochanan E Naschitz. "Upgrading Bedside Skills - A Must in Caring for the Elderly". Acta Scientific Medical Sciences 5.4 (2021): 107-119



Figure 7: Preseptal cellulitis.

cellulitis is usually a mild condition that rarely leads to serious complications, whereas orbital cellulitis may cause loss of vision and even loss of life. Orbital cellulitis is an infection involving the contents of the orbit, the adipose tissue and ocular muscles (not the globe). Both, preseptal and orbital cellulitis share ocular pain, eyelid swelling and erythema. Orbital cellulitis but not preseptal cellulitis is associated with ophthalmoplegia, pain with eye movements, and proptosis. Computed tomography scanning of the orbits and sinuses is used to distinguish preseptal cellulitis from orbital cellulitis [21].

Herpes zoster is an infection resulting from reactivation of varicella-zoster virus that affects peripheral or cranial nerves. The diagnosis may be straightforward based on the triad prodromal pain, characteristic rash and dermatomal distribution (Figure 8). A differential diagnosis might be mandatory before the characteristic eruption evolves or in cases with atypical eruptions. A herpetic lesion on the side of the nose, i.e. the dermatome of the nasociliary nerve, is a the "red flag" heralding ocular inflammation and the need for intensified treatment [22].

Bruises are the result of bleeding into the skin when blood vessels are damaged and red blood cells escape into the surrounding skin. Spontaneous bruising may be due to abnormal blood vessels, abnormality of the adjacent skin, impaired platelet function, or a coagulation disorder, a consequence of skin ageing, complication of



Figure 8: Typical case of herpes zoster ophtalmicus.

systemic or topical corticosteroid treatment. Bruising can be triggered or exacerbated by anticoagulant or antiaggregant medication. Some bleeding symptoms reflect an underlying bone marrow disorder. A blunt trauma of sufficient power always causes bruises. Minor trauma may cause bruises when the blood vessels are fragile, but often the trigger remains obscure. A careful medical history and physical examination can narrow the diagnostic possibilities.



Figure 9: Bruising of the face – two different conditions. A. Bruising caused by coughing and straining. B. Bruising caused by physical mistreatment.

Bruising limited to the face, neck and/or thoracic outlet might be attributed to bouts of high intrathoracic pressure during straining and coughing. This usually is a benign occurrence. It should be distinguished from an ecchymosis expanding from an internal organ to the neck or chest wall, the latter needing urgent diagnostic imaging and treatment. It should also be distinguished from bruising caused by physical mistreatment, which requests inquiries, penalty, and measures to prevent the misconduct [23].

Disorders of skin pigmentation can permit facilitate the diagnosis of the underlying disease, e.g. Addisonian hyperpigmentation, hypopigmentation; pigmented tumors, e.g. melanoma; congestion, e.g. polycytemia; ischemia, e.g. livedo reticularis.



Figure 10: Vitiligo

Vitiligo is a common skin disorder characterized by progressive cutaneous hypomelanosis. Vitiligo may be associated with several autoimmune diseases, dermatological diseases, primarily thyroid disease, alopecia areata, diabetes mellitus, pernicious anemia, systemic lupus erythematosus, rheumatoid arthritis, Addison's disease, inflammatory bowel disease, Sjögren's syndrome, dermatomyositis, scleroderma, ocular and audiological abnormalities, psoriasis, and atopic dermatitis. It is essential to be aware of these comorbidities in order to improve the disease burden of patients with vitiligo [24].

Livedo reticularis is a net-like, violaceous, hyperpigmented pattern on the skin that reflects an underlying change in cutaneous



Figure 11: Livedo reticularis.

blood flow. The most common underlying diseases are connective tissue disease, Raynaud phenomenon, paraproteins, essential thrombocytopenia, and polycythemia vera. 'Physiologic' livedo reticularis or 'cutis marmorata' represents a normal vasospastic response that occurs upon cold exposure in healthy individuals. In contrast to pathologic livedo reticularis, the physiologic livedo reticularis disappears upon warming [25].

Tinea corporis presents as an erythematous annular plaque with a scaly, centrifugally advancing border [26]. Extensive tinea should alert to a compromised immune system (Figure 12).



Figure 12: Tinea corporis in a patient with prolymphocytic leukemia.

The diagnosis of skin ulcers may be an easy task, as for pressure ulcers (pressure injury), neuropathic ulcers, venous ulcers and ischemic ulcers. A pressure injury is recognized by revealing the direct contact of the skin and soft tissues in the injured area with a bony prominence or with a device. Typical locations are the presacral area, heels (Figure 13), ischial tuberosities and the occiput. In unusual locations, 'atypical pressure ulcers' may develop at the medial aspects of the knees, elbows, and palms in the context of severe spasticity, or over shoulder blades and the upper spine related to bony deformities [27].



26 Nov 2015

Figure 13: Pressure ulcer of the heel, at different phases of evolution. Left, ulcer covered by crust; middle, stage 3 pressure ulcer with granulation and a rim of epithelialization; right, further decrease in size of the ulcer size.

Venous ulcers are the most common type of chronic lower extremity ulcers. Venous hypertension as a result of venous reflux or obstruction is the primary underlying mechanism for venous ulcer formation [28].

The diagnosis of atypical skin ulcers, either infectious, vasculitic, neoplastic, drug-induced, or idiopathic is more demanding.

Pyoderma gangrenosum is characterized by the development of an erythematous pustule or nodule that rapidly progresses to become a necrotic ulcer with a ragged, undermined, violaceous edge. Large lesions up to 20 cm or more in diameter may result from coalescence of smaller ulcers. Not infrequently, minor trauma may initiate the onset of a lesion - a process known as pathergy. In more than half of the cases there is an associated systemic illness such as ulcerative colitis, Crohn's disease, collagenous colitis, rheumatoid



Figure 14: Venous ulcer, varicose veins and melanic pigmentation on the right calf. The subcutaneous layers on the right calf felt stony hard; the volume of the mid-to-distal segment of the right calf is reduced due to sclerosis and retraction of the subcutaneous layers. The latter is consistent with lipodermatosclerosis of chronic venous disease. The figure illustrates complications of chronic venous stasis.



Figure 15: Pyoderma gangrenosum, the classic ulcerative form.

arthritis, seronegative polyarthritis, or a monoclonal gammopathy, particularly of IgA type. Fully developed ulcerative lesions are difficult to distinguish from ulcers that result from a variety of other causes. Pyoderma gangrenosum has often been considered a diagnosis of exclusion. Pyoderma gangrenosum may run an acute progressive course with rapidly expanding lesions that require systemic corticosteroids to arrest their growth [29].

Critical limb threatening ischemia represents the most advanced clinical stage of peripheral arterial disease. It is usually caused by



**Figure 16:** Drug induced vasculitic skin ulcers which occurred under Nivolumab treatment.

atherosclerotic arterial disease and is associated with very high morbidity and mortality. The most common clinical manifestations are limb pain at rest, with or without trophic skin changes or tissue loss [30]. Diagnosis of critical limb ischemia is based on physical examination (Figure 17). Measurement of the ankle-brachial index, duplex-ultrasound, angiography, and transcutaneous oxygen measurement may be useful. Unilateral swelling of the calf is suggestive of deep vein thrombosis (differential diagnosis with dissected popliteal cyst, muscle or tendon tear, soft tissue infection, and inflammation, a setting collectively called pseudothrombophlebitis) [31]. Unilateral swelling of the entire lower extremity is consistent with iliac vein thrombosis (differential diagnosis with external compression of the iliac vein by lymph nodes, tumor, or an overriding artery).

Skin metastases usually do not pose a diagnostic challenge (Figure 18).



Figure 18: Sister Marie Joseph nodule is a metastatic umbilical lesion.



**Figure 17:** Severe ischemia of the toes, dry gangrene of toes 4 and 5 of the left foot. The patient suffered from atherosclerotic peripheral arterial disease and of antiphospholipid syndrome.

The sister Marie Joseph nodule is a metastatic umbilical lesion secondary to malignancy of any viscera. It can be a presenting sign of malignancy or a sign of progression or recurrence of a known case. The tumor may spread to the umbilicus through lymph ducts, blood vessels, contiguous extension, or embryologic remnants. Typically, it is a firm irregular nodule, 1 to 1.5 cm in size (occasionally up to 10 cm in diameter). The nodule may be painful and ulcerated [32].

Abnormal gait patterns are easily recognized: the analgesic gait (limping, reduced stance phase on affected limb); paretic hypotonic gait (dropping foot, high steppage); spastic gait (circumduction); vestibular gait (deviation to one side); ataxia (wide base gait), dyskinetic (extra movements on gait); hypokinetic rigid gait (rigidity, slow speed, short stride, hesitation and freezing); cautious gait

115

('walking on ice', striking improvement with external support); higher level gait disorders (severe balance impairment, inadequate foot placement, falling 'like a log'); throwing the torso toward the affected side in attempt to keep balance with the pelvis still tilted down (Trendelenburg gait) is due to weakness of the hip abductor muscle; posterior lurch and increased lumbar lordosis occurs with weakness of the hip extensors; the knee hyperextended or straight indicates impaired quadriceps contraction; calcaneal gait indicates weakness of the gastocnemius muscle; drop-foot and/or steppage gait occurs with paralysis of the anterior tibial muscle. If it is possible to recognize abnormal gait patterns in the early stage of the related disease, patients might receive earlier and more effective treatment [33]. In Parkinson's disease, the slow and small stepped gait with reduced angular excursion of the joints, difficulty to initiate movement or sustain movement, sudden freezes are characteristic.

Attention to the urine's color may provide useful information: transparent - dilute urine; dark yellow - normal, possible dehydration; foaming or fizzing - kidney disease; amber - dehydration; orange - dehydration, UTI, liver disease, jaundice, isoniazide, sulfasalazine; red - hematuria, hemoglobinuria, carrots, blackberries; brown - severe dehydration, paracetamol, metronidazole, nitrofurantoin, porphyria, melanoma, hemolysis; black - iron, laxatives, rhabdomyolysis, L-dopa, metronidazole, nitrofurantoin, porphyria, melanoma; blue-green - pseudomonas UTI, methylen blue, food dye, blue diaper, porphyria; purple: purple urine bag syndrome; white: proteinuria, chyluria, hyperoxaluria, hypercalciuria, phosphaturia [34].

#### Laboratory tests

A battery of basic laboratory tests, the electrocardiogram and chest X-rays are integrals of routine geriatric examination. Standard laboratory tests are performed on admission to the ward of the longterm geriatric care facility. Problem oriented tests are ordered as needed. The decisive question is whether the test results will make a difference for the patient. Currently available tests, having sensitivities and specificities in the 80% range, are not optimal to decide who is diseased and who is disease-free. Therefore, when the prevalence of a specified disease is high in the population, a positive test result is predictable and the test contributes little to 116

the diagnosis; when the prevalence of the disease in the population is low, a negative test result can be anticipated; so neither a positive nor a negative result do change the post-test probability of disease, which remains low.

There also may be problems concerning interpretation of certain laboratory tests, since reference ranges established in healthy adults may not fit to old persons. Results of some tests may be affected by interference with heterophile antibodies incidentally present in the patient's sera [35]. Interference errors may occur with immunologic tests for assessment of hormone levels (e.g. TSH), viral serologies (e.g. HBsAg), tumor markers (e.g. CEA) and biomarkers of cardiac injury (e.g. cardiac troponin), potentially leading to unnecessary procedures, anxiety and expense. Physicians should suspect an erroneous result if it contradicts the clinical setting. Confirmation with alternative techniques should be sought. Yet, the laboratory may be correct even if intriguing.

#### The electrocardiogram (ECG)

An ECG tracing on admission serves as reference for recordings becoming necessary later under emergency. The computerized interpretation of the ECG has become routine and is available on portable ECG equipment. These interpretations are accurate for most normal ECGs. But misinterpretations can occur due to artifacts or lead reversal, by incorrect detection of arrhythmias, pacemakers, and myocardial infarction. Some programs cannot recognize J waves and slurs, yet frequently output the statement 'early repolarization'. The computer may fail to correctly measure the QT interval, having difficulty in identifying the termination of a flat T wave. These possible errors require that all computerized statements be over-read by trained physicians who also have the advantage of knowing the patient's clinical context [36].

#### **Bladder ultrasound**

Four studies examined the accuracy of portable bladder ultrasound examination and found that the device is acceptable for clinical use in the elderly population. In being a surrogate measure, the device is less accurate than direct measurement of the bladder volume by catheterization. When the hand-held ultrasound

117

transducer is directed improperly the bladders can be missed or the lateral borders of the bladder may not be visualized, resulting in underestimation of the bladder volume [37].

#### **Chest X-rays**

A chest X-ray is part and parcel of the geriatric examination. Limitations inherent to this modality should be kept in mind. The optimal technical conditions are difficult to be met on bedside chest X-rays. Interpretation of the radiograph needs to be backed by knowledge of the clinical context. For example, in a patient with suspected pneumonia, the new X-ray should be compared with prior X-rays (if available), examined by a clinician experienced in interpretation (assisted by a radiologist if possible), and interpreted in knowing the patient's recent and past medical history and data of physical examination.

The sensitivity of chest radiography in the diagnosis of pneumonia is far from being optimal. In one study, nearly one third of patients with clinical presentations suggesting pneumonia had pulmonary infiltrates recognized on CT but not on the chest radiograph [38]. Therefore, the diagnostic criteria requiring the presence of new opacifications on chest X-ray for establishing the diagnosis of pneumonia may cause delay in diagnosis. A special consideration should be given to round pneumonia, resembling on imaging to a lung tumor. Although fever and cough can point to an infectious etiology, occasionally, bronchogenic carcinoma can present with pneumonia secondary to obstruction of a bronchus and superimposed infection. A trial of antibiotics followed by a repeat chest XR after 3-4 weeks should be considered in adults presenting with a solitary pulmonary mass [39].

#### **Comprehensive geriatric assessment**

Comprehensive geriatric assessment is a multidimensional, interdisciplinary diagnostic process aimed to determine a frail elderly person's medical, psychological, and functional capabilities [40]. It is core technology in geriatric medicine carried out by a team of physician, nurse, therapists, social worker, and dietician, all of them currently attending the patient. The purpose is to appraise the patient's functional status, behavioral and medical problems; to pay attention to changes having occurred from the time of the previous comprehensive assessment; to appreciate how treatment recommendations were implemented; adapt treatment to the present condition; provide information to patient and family and clarify expectations. Priorities of care are discussed, and the level of care tailored to the patient's present condition. Any change in treatment should be discussed with the patient and family.

#### **Diagnostic reasoning**

Physicians use a hypothetical-deductive approach to make diagnoses. Intuition allows the physician to generate instantly diagnostic hypotheses by taking a few pieces of information, associating them, and comparing the result with patterns stored in the physician's long-term memory. After generating diagnostic hypotheses physicians test them by collecting more data. However, diagnostic uncertainty and diagnostic error are estimated at about 5%-15%, depending on the specialty [41]. Cognitive biases are the cause of most diagnostic errors. Premature closure bias is the tendency to stop considering other hypotheses after reaching a diagnosis. Availability bias is the tendency to consider more likely those diagnoses that have recently been made. Anchoring bias is the tendency to focus early on one or more salient features of the initial presentation and failure to change this first impression in the light of data disclosed in the followings. Confirmation bias is the tendency to consider only confirmatory data in relation to the generated hypothesis, while ignoring or underestimating contradictory data. In facing diagnostic uncertainty, artificial intelligence emerges as a tool to help clinicians in their reasoning, reduce diagnostic uncertainty and augment shared decision-making. For the time being, replacement of human intelligence by artificial intelligence is unlikely, apart from some highly targeted tasks [41].

#### **Conclusions**

Clinical skills remain fundamental to the practice of medicine. However, the practice of some clinical skills is declining. Shortcomings in physical examination skills have been documented in numerous studies and ascribed to the decline of bedside teaching and an increased dependence on technology. Poor physical examination skills lead to more injudicious referrals, patient mismanagement and added costs. The unnecessary reliance on investigations has made it harder for modern-day physicians to meet the day-today needs of patients seeking medical care, especially in resourcelimited settings. A thorough physical examination itself is not a substitute for the use of technology. However, application of a thorough history and physical examination is necessary to guide the prudent use of technology. Potential advantages of this approach include enhanced physician-patient relationship, improved patient safety, fewer diagnostic errors, and lower financial costs [42]. Ultimately, no technology can replace the basic human-human interaction between patient and physician.

## **Bibliography**

- Kogan AC., et al. "Person-Centered Care for Older Adults with Chronic Conditions and Functional Impairment: A Systematic Literature Review". Journal of the American Geriatrics Society 64.1 (2016): e1-7.
- Schattner A. "The essence of humanistic medicine". QJM 113 (2020): 3-4.
- 3. Mann S., *et al.* "The medical interview: Differences between adult and geriatric outpatients". *Journal of the American Geriatrics Society* 49 (2001): 1-65.
- 4. Hofman MR., *et al.* "Elderly patients with an atypical presentation of illness in the emergency department". *Netherlands Journal of Medicine* 75.6 (2017): 241-246.
- High KP. "Infections in older adults". In: Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases 310 (2020): 3704-3712.e1
- 6. Harvey PD. "Domains of cognition and their assessment". *Dialogues in Clinical Neuroscience* 21.3 (2019): 227-237.
- Samuel M., *et al.* "A review of prescribing over the counter medicines (OTC's) in the OMFS department, Ipswich Hospital". *British Journal of Oral and Maxillofacial Surgery* 58.10 (2020): e148-e148.
- 8. Muth C., *et al.* "Evidence supporting the best clinical management of patients with multimorbidity and polypharmacy: a systematic guideline review and expert consensus". *Journal of Internal Medicine* 285.3 (2019): 272-288.

- 9. High KP., *et al.* "Clinical practice guideline for the evaluation of fever and infection in older adult residents of long-term care facilities: 2008 update by the Infectious Diseases Society of America". *Clinical Infectious Diseases* 48 (2009): 149-171.
- Obermeyer Z., *et al.* "Individual differences in normal body temperature: longitudinal big data analysis of patient records". *BMJ* 359 (2017): j5468.
- Elias MF and Goodell A. "Human errors in automated office blood pressure measurement: still room for improvement". *Hypertension* 77.1 (2021): 6-15.
- 12. Gaynor E., *et al.* "Interarm blood pressure difference in a poststroke population". *Journal of the American Society of Hypertension* 11 (2017): 565-572.e5.
- Seguret D., *et al.* "Blood pressure measurements on a bare arm, over a sleeve or below a rolled-up sleeve: a systematic review and meta-analysis". *Journal of Hypertension* 2020 38 (2020): 1650-1658.
- 14. Stergiou GS., *et al.* "Automated blood pressure measurement in atrial fibrillation: a systematic review and meta-analysis". *Journal of Hypertension* 30 (2012): 2074-2082.
- 15. Rimbi M., *et al.* "Respiratory rates observed over 15 and 30 s compared with rates measured over 60 s: practice-based evidence from an observational study of acutely ill adult medical patients during hospital admission". *QJM* (2019): 513-517.
- Jensen LA., *et al.* "Meta-analysis of arterial oxygen saturation monitoring by pulse oximetry in adults". *Heart Lung* 27 (1998): 387-408.
- 17. Maki DG. "Stethoscopes and health care–associated infection". *Mayo Clinic Proceedings* 89 (2014): 277-280.
- Maxwell-Scott H and Kandil H. "Diagnosis and management of cellulitis and erysipelas". *British Journal of Hospital Medicine* (Lond) 76 (2015): C114-117.
- 19. Liaw FY., *et al.* "Elephantiasis nostras verrucosa: swelling with verrucose appearance of lower limbs". *Canadian Family Physician* 58.10 (2012): e551-553.
- 20. James WD., *et al.* "Bacterial infect ions". In: Andrews' Diseases of the Skin, 14 (2020): 252-290.e4.

118

- 21. El Mograbi A., *et al.* "Orbital complications of rhinosinusitis in the adult population: analysis of cases presenting to a tertiary medical center over a 13-year period". *Annals of Otology, Rhinology and Laryngology* 128 (2019): 563-568.
- 22. Vrcek I., *et al.* "Herpes zoster ophthalmicus: a review for the internist". *American Journal of Medicine* 130 (2017): 21-26.
- 23. Hayward CPM. "Clinical approach to the patient with bleeding or bruising". In: Hoffman R, Benz EJ, Silberstein LE et al. Hematology: Basic Principles and Practice, Seventh Edition, Elsevier 128 (2018): 1912-1921.
- Dahir AM and Thomsen SF. "Comorbidities in vitiligo: comprehensive review". *International Journal of Dermatology* 57.10 (2018): 1157-1164.
- 25. Rose AE., *et al.* "Livedo reticularis". *Dermatology Online Journal* 19.12 (2013): 20705.
- Ely JW., et al. "Diagnosis and management of tinea infections". *American Family Physician* 90.10 (2014): 702-710.
- Edsberg LE., *et al.* "Revised National Pressure Ulcer Advisory Panel Pressure Injury Staging System: Revised pressure injury staging system". *Journal of Wound Ostomy and Continence Nursing* 43 (2016): 585-597.
- 28. Bonkemeyer Millan S., *et al.* "Venous ulcers: diagnosis and treatment". *American Family Physician* 100.5 (2019): 298-305.
- 29. George C., *et al.* "Pyoderma gangrenosum a guide to diagnosis and management". *Clinical Medicine* (Lond). 19.3 (2019): 224-228.
- 30. Gresele P., *et al.* "Critical limb ischemia". *Internal and Emergency Medicine* 6 (2011): 129-134.
- Kabeya Y., et al. "Pseudothrombophlebitis". Internal Medicine 48 (2009): 1927.
- 32. Palaniappan M., *et al.* "Umbilical metastasis: a case series of four Sister Joseph nodules from four different visceral malignancies". *Current Oncology* 17 (2010): 78-81.
- 33. Magee DJ and Manske RC. "Assessment of gait". *Orthopedic Physical Assessment* 14 (2021): 1096-1126.
- Riley RS and McPherson RA. "Basic examination of the urine". Henry's Clinical Diagnosis and Management of Laboratory Methods 28 (2017): 442-480.

- 35. Marks V. "False-positive immunoassay results: a multicenter survey of erroneous immunoassay results from assays of 74 analytes in 10 donors from 66 laboratories in seven countries". *Clinical Chemistry* 48 (2002): 2008-2016.
- 36. Smulyan H. "The computerized ECG: friend and foe". *American Journal of Medicine* 132 (2018): 153-160.
- 37. Health Quality Ontario. "Portable bladder ultrasound: an evidence-based analysis". Journal: Ontario Health Technology Assessment Series 6 (2006): 1-51.
- Self WH., *et al.* "High discordance of chest x-ray and computed tomography for detection of pulmonary opacities in ED patients: implications for diagnosing pneumonia". *American Journal of Emergency Medicine* 31 (2013): 401-405.
- 39. Gupta S., *et al.* "A disappearing lung mass: round pneumonia". *American Journal of Medicine* 132 (2019): e656-e657.
- 40. Marshall EG., *et al.* "A long-term care-comprehensive geriatric assessment (LTC-CGA) tool: improving care for frail older adults?" *Canadian Geriatrics Journal* 18 (2015): 2-10.
- 41. Pelaccia T., *et al.* "Deconstructing the diagnostic reasoning of human versus artificial intelligence". *CMAJ* 191 (2019): E1332-1335.
- Zaman J., *et al.* "The value of physical examination: a new conceptual framework". *Southern Medical Journal* 109 (2016): 754-757.

### Assets from publication with us

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

#### Website: www.actascientific.com/

Submit Article: www.actascientific.com/submission.php Email us: editor@actascientific.com Contact us: +91 9182824667