



Short Review

Rational use of Laboratory Tests

Melahat Akdeniz* and Taylan Gur

Department of Family Medicine, Akdeniz University, Antalya, Turkey

Abstract

Laboratory tests are used for many purposes such as disease detection, diagnosis and monitoring. The use of rational laboratory tests is aimed at ordering tests that may be beneficial in patient management and that will not harm them. Overutilization of tests may lead to unnecessary use of health services and interventions of questionable benefit, while underutilization of appropriate tests may lead to adverse health outcomes and increased future use of health care resources. The physicians have a responsibility to protect their patients from being harmed by interventions and treatments due to unnecessary and excessive tests.

Keywords: Inappropriate ordering of tests; Primary care; Rational use of laboratory tests

Introduction

Laboratory testing such as blood tests and radiography are important tools for the making correct diagnoses, identifying the presence, absence or characteristics of a condition of interest in a patient, and aiming to develop a plan to the appropriate treatment. Due to the advances in laboratory technology and tests and the increasing level of medical knowledge, the number of tests required is gradually increasing. With the increase in the number of tests that is ordered, both the side effects caused by the tests and the side effects brought by the treatments initiated after the false positive results increase the risk of injury to the patients during the screening and diagnosis processes. Additionally, once an abnormal test result is found, clinicians may order further investigations, not realising that on average 5% of test results are outside their reference ranges and a cascade of testing may result [1,2].

*Corresponding author: Melahat Akdeniz, Department of Family Medicine, Akdeniz University, Antalya, Turkey, Tel: +90 2422496000; E-mail: melahatakdeniz@gmail.com

Citation: Akdeniz M, Gur T (2020) Rational use of Laboratory Tests. J Gerontol Geriatr Med 6: 047.

Received: February 19, 2020; **Accepted:** February 26, 2020; **Published:** March 04, 2020

Copyright: © 2020 Akdeniz M, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

In the context of quaternary prevention, family physicians have a responsibility to protect their patients from unnecessary and excessive tests, interventions and treatments. According to the definition of WONCA, quaternary prevention means identifying patients who are prescribed excessive medication, protecting them from new medical interventions and offering them ethically acceptable interventions [3]. Rational laboratory use is defined as effective and correct laboratory use by providing the most appropriate test selection with the right clinical approach in line with the evidence based data and considering the cost and patient safety [4]. Nowadays, in connection with the advances in technology, the number of laboratory tests that we can use in diagnostic research is increasing, but this increase also causes the patients to be asked for more tests than necessary.

Irrational use of laboratory tests has been demonstrated in some studies. In a study conducted in a tertiary hospital in India; the laboratory tests requested from 90 patients selected by random sampling from patients who were hospitalized within 3 months were examined. In these patients, 42 different tests were requested, the total number of which was 2653. It was thought that 70.1% of these laboratory tests did not contribute to the diagnosis and treatment management of the patients. It was determined that 20% of the selected patients had routine blood tests three or more times [5]. In 2013, in a study conducted by Levick et al., in USA, a computer-assisted system was used to remind the results of previous test if the same test was ordered from patients who were previously ordered for B Natriuretic Peptide [BNP]. With this practice, it was observed that BNP orders decreased by 21% and this led to an annual decrease of 92,000 dollars from hospital expenses [6].

In a study conducted by Vegting et al., in the Department of Internal Medicine at Vrije University in Amsterdam, the effect of such as increasing inspections by senior doctors, removing tests panels, distributing the information cards about cost of tests to doctors, weekly meetings on ordered tests, facilitating access to ministry protocols interventions on health authority has been investigated. During the year in which the interventions were practised, the laboratory test costs of the internal medicine department decreased by 21% and the following year, the test costs of the entire hospital were reduced by 14% [7]. In a study conducted by Baricchi et al., in Italy, all general practitioners in the region were trained about some tests. After course, it was asked to write the possible diagnosis in their test request forms when they ordered test. It was observed that the total number of test ordered by physicians trained the following year decreased by 5%, and the total number of test ordered by the control group increased by 1% [8].

In 2012, The Choosing Wisely® (www.choosingwisely.org) campaign was created as an initiative of the American Board of Internal Medicine (ABIM) Foundation (www.abimfoundation.org) to improve health care quality. The goal of the campaign is to promote conversations between clinicians and patients by helping patients choose care that is: supported by evidence, not duplicative of other tests or procedures already received, free from harm, truly necessary. It calls upon leading medical specialty societies and other organizations to

identify tests or procedures commonly used in their field whose necessity should be questioned and discussed with patients. More than 70 specialty societies have identified commonly used tests or procedures within their specialties that are possibly overused.

In early 2014, the ABIM Foundation, with funding from the Robert Wood Johnson Foundation, commissioned a survey conducted by PerryUndem Research/Communication to explore physician attitudes regarding the overuse of medical services in the United States. The research found that nearly three out of four U.S. physicians say the frequency with which doctors order unnecessary medical tests and procedures is a serious problem for America's health care system. It is recognized that rational laboratory use will significantly reduce health costs. In order to reduce the cost of health care, some measures have been tried to reduce irrational laboratory use. These include measures such as "prohibiting the ordering of certain tests for certain specialties, not reimbursing for unnecessary tests, preventing repeated tests, using computer-based reminders and decision support systems" [9].

Unfortunately, when guidelines on selective and rational ordering of laboratory tests are introduced, numerous motives for ignoring evidence based recommendations, such as fear of litigation, come into play in daily practice and are difficult to influence. Another reason for physicians' orders for excessive testing may be the concern of failing to manage chronic diseases. Patients may have a chronic disease, and question the skills of their doctor when it cannot be cured, or have recurrent vague or unexplained complaints which doctors may be tempted to overinvestigate. In this condition, it is recommended to explain to patients that not all tests give reliable results. Physicians can use shared decision-making and Clinical decision support intervention to reduce inappropriate tests in primary care [10,11].

Elderly people constitute a significant number of people cared for by family physicians. Elderly people are the group most affected by the results of inappropriate interventions caused by unnecessary test use. Therefore, rational laboratory test use is important in the care of elderly people. Overdiagnosis resulting from inappropriate test may cause negative results in elderly people. For example, overdiagnosis of prostate cancer due to prostate-specific antigen screening of the general population is responsible for the annual incidence to mortality ratio for prostate cancer of approximately 6 to 1 [12].

Conclusion

Clinical laboratory testing is integral to the delivery of health care, as a significant majority of medical decisions are influenced by the results of laboratory tests. However, it is accepted that approximately 20% to 50% of laboratory testing may not be appropriate [11]. Overutilization of tests may lead to unnecessary use of health services and interventions whose benefit can be questioned, while underutilization of appropriate tests may lead to adverse health outcomes and increased future use of health care resources. There is a need to balance the desirable and undesirable consequences of tests results for the patients in order to laboratory tests.

References

1. Buehler AM, de Oliveira Ascef B, de Oliveira Junior HA, Ferri CP, Fernandes JG (2019) Rational use of diagnostic tests for clinical decision making. *Rev Assoc Med Bras* 65: 452-459.
2. Winkens R, Dinant GJ (2002) Evidence base of clinical diagnosis: Rational, cost effective use of investigations in clinical practice. *BMJ* 324: 783.
3. <http://www.ph3c.org/PH3C/docs/27/000092/0000052.pdf>
4. Akbiyik F (2017) Rational Laboratory Use. *Turkish Clinical Biochemistry Congress K-16b*: 54.
5. Alvi Y, Rahman SZ, Zaheer MS (2012) A study of 'Rational Use of Investigations' in a tertiary hospital. *International Journal of Collaborative Research on Internal Medicine & Public Health* 4: 1265-1275.
6. Levick DL, Stern G, Meyerhoefer CD, Levick A, Pucklavage D (2013) "Reducing unnecessary testing in a CPOE system through implementation of a targeted CDS intervention". *BMC Med Inform Decis Mak* 13: 43.
7. Vegting IL, van Beneden M, Kramer MH, Thijs A, Kostense PJ, et al. (2012) How to save costs by reducing unnecessary testing: Lean thinking in clinical practice. *Eur J Intern Med* 23: 70-75.
8. Baricchi R, Zini M, Nibali MG, Vezzosi W, Insegnante V, et al. (2012) Using pathology-specific laboratory profiles in clinical pathology to reduce inappropriate test requesting: two completed audit cycles. *BMC Health Serv Res* 12: 187.
9. ABIM Foundation (2014) *Unnecessary Tests and Procedures in the Health Care System*. ABIM Foundation, Philadelphia, USA.
10. Korenstein D, Chimonas S, Barrow B, Keyhani S, Troy A, et al. (2018) Development of a Conceptual Map of Negative Consequences for Patients of Overuse of Medical Tests and Treatments. *JAMA Intern Med* 178: 1401-1407.
11. Verbrugge S (2014) *Initiatives to optimize the utilization of laboratory tests*. Ottawa: Canadian Agency for Drugs and Technologies in Health. Environmental Scan 44.
12. Sandhu GS, Andriole GL (2012) Overdiagnosis of Prostate Cancer. *J Natl Cancer Inst Monogr* 2012: 146-151.



- Advances In Industrial Biotechnology | ISSN: 2639-5665
- Advances In Microbiology Research | ISSN: 2689-694X
- Archives Of Surgery And Surgical Education | ISSN: 2689-3126
- Archives Of Urology
- Archives Of Zoological Studies | ISSN: 2640-7779
- Current Trends Medical And Biological Engineering
- International Journal Of Case Reports And Therapeutic Studies | ISSN: 2689-310X
- Journal Of Addiction & Addictive Disorders | ISSN: 2578-7276
- Journal Of Agronomy & Agricultural Science | ISSN: 2689-8292
- Journal Of AIDS Clinical Research & STDs | ISSN: 2572-7370
- Journal Of Alcoholism Drug Abuse & Substance Dependence | ISSN: 2572-9594
- Journal Of Allergy Disorders & Therapy | ISSN: 2470-749X
- Journal Of Alternative Complementary & Integrative Medicine | ISSN: 2470-7562
- Journal Of Alzheimers & Neurodegenerative Diseases | ISSN: 2572-9608
- Journal Of Anesthesia & Clinical Care | ISSN: 2378-8879
- Journal Of Angiology & Vascular Surgery | ISSN: 2572-7397
- Journal Of Animal Research & Veterinary Science | ISSN: 2639-3751
- Journal Of Aquaculture & Fisheries | ISSN: 2576-5523
- Journal Of Atmospheric & Earth Sciences | ISSN: 2689-8780
- Journal Of Biotech Research & Biochemistry
- Journal Of Brain & Neuroscience Research
- Journal Of Cancer Biology & Treatment | ISSN: 2470-7546
- Journal Of Cardiology Study & Research | ISSN: 2640-768X
- Journal Of Cell Biology & Cell Metabolism | ISSN: 2381-1943
- Journal Of Clinical Dermatology & Therapy | ISSN: 2378-8771
- Journal Of Clinical Immunology & Immunotherapy | ISSN: 2378-8844
- Journal Of Clinical Studies & Medical Case Reports | ISSN: 2378-8801
- Journal Of Community Medicine & Public Health Care | ISSN: 2381-1978
- Journal Of Cytology & Tissue Biology | ISSN: 2378-9107
- Journal Of Dairy Research & Technology | ISSN: 2688-9315
- Journal Of Dentistry Oral Health & Cosmesis | ISSN: 2473-6783
- Journal Of Diabetes & Metabolic Disorders | ISSN: 2381-201X
- Journal Of Emergency Medicine Trauma & Surgical Care | ISSN: 2378-8798
- Journal Of Environmental Science Current Research | ISSN: 2643-5020
- Journal Of Food Science & Nutrition | ISSN: 2470-1076
- Journal Of Forensic Legal & Investigative Sciences | ISSN: 2473-733X
- Journal Of Gastroenterology & Hepatology Research | ISSN: 2574-2566
- Journal Of Genetics & Genomic Sciences | ISSN: 2574-2485
- Journal Of Gerontology & Geriatric Medicine | ISSN: 2381-8662
- Journal Of Hematology Blood Transfusion & Disorders | ISSN: 2572-2999
- Journal Of Hospice & Palliative Medical Care
- Journal Of Human Endocrinology | ISSN: 2572-9640
- Journal Of Infectious & Non Infectious Diseases | ISSN: 2381-8654
- Journal Of Internal Medicine & Primary Healthcare | ISSN: 2574-2493
- Journal Of Light & Laser Current Trends
- Journal Of Medicine Study & Research | ISSN: 2639-5657
- Journal Of Modern Chemical Sciences
- Journal Of Nanotechnology Nanomedicine & Nanobiotechnology | ISSN: 2381-2044
- Journal Of Neonatology & Clinical Pediatrics | ISSN: 2378-878X
- Journal Of Nephrology & Renal Therapy | ISSN: 2473-7313
- Journal Of Non Invasive Vascular Investigation | ISSN: 2572-7400
- Journal Of Nuclear Medicine Radiology & Radiation Therapy | ISSN: 2572-7419
- Journal Of Obesity & Weight Loss | ISSN: 2473-7372
- Journal Of Ophthalmology & Clinical Research | ISSN: 2378-8887
- Journal Of Orthopedic Research & Physiotherapy | ISSN: 2381-2052
- Journal Of Otolaryngology Head & Neck Surgery | ISSN: 2573-010X
- Journal Of Pathology Clinical & Medical Research
- Journal Of Pharmacology Pharmaceutics & Pharmacovigilance | ISSN: 2639-5649
- Journal Of Physical Medicine Rehabilitation & Disabilities | ISSN: 2381-8670
- Journal Of Plant Science Current Research | ISSN: 2639-3743
- Journal Of Practical & Professional Nursing | ISSN: 2639-5681
- Journal Of Protein Research & Bioinformatics
- Journal Of Psychiatry Depression & Anxiety | ISSN: 2573-0150
- Journal Of Pulmonary Medicine & Respiratory Research | ISSN: 2573-0177
- Journal Of Reproductive Medicine Gynaecology & Obstetrics | ISSN: 2574-2574
- Journal Of Stem Cells Research Development & Therapy | ISSN: 2381-2060
- Journal Of Surgery Current Trends & Innovations | ISSN: 2578-7284
- Journal Of Toxicology Current Research | ISSN: 2639-3735
- Journal Of Translational Science And Research
- Journal Of Vaccines Research & Vaccination | ISSN: 2573-0193
- Journal Of Virology & Antivirals
- Sports Medicine And Injury Care Journal | ISSN: 2689-8829
- Trends In Anatomy & Physiology | ISSN: 2640-7752

Submit Your Manuscript: <https://www.heraldopenaccess.us/submit-manuscript>