EDITORIAL

Demand Management in the Laboratory

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Clinical laboratories are central players in modern medicine, providing pathology testing for medical screening, diagnosis, prognosis and treatment (1). Over the past decade, utilisation of laboratory tests have markedly increased, driven by various factors such as greater accessibility of healthcare services, better-informed patients, widespread disease screening, disease management initiatives, care delivery models, as well as practice of defensive medicine (2). Nevertheless, this rise in testing frequency is accompanied by a surge in inappropriate requests (3), with published reports demonstrating a staggering 20% - 40% of laboratory requests being inappropriate (2). Inappropriate testing can be either due to underutilisation or overutilisation of pathology tests (3). While underutilisation of pathology tests may result in missed or delayed diagnosis, overutilisation reduces diagnostic accuracy through generation of false-positive results, creates unwarranted downstream medical treatment, and adds to the rising costs of care (3).

In the pursuit to overcome inappropriate utilisation of laboratory tests, laboratories are increasingly looking at demand management (DM). DM revolves around the concept of using various approaches to maintain appropriate test requesting (4). In its broadest sense, it focuses on ensuring that the right test is performed at the right time, in the right order, for the right purpose (2).

Numerous strategies can be introduced for managing laboratory demand, either focused on controlling the demand before, during or after the test request. Pre-laboratory strategies modulate the demand prior to test requests, and are primarily preventive in nature. The aim is to curb inappropriate orders before they reach the laboratory, for instance via education and open communication (2,4). Educational approaches through knowledge sharing between laboratory personnel and clinicians range from simple discussions, continuous medical education to best practice guidance (2). Such information transfer in the form of verbal, written or electronic format, aims to fill in the gap of appropriate testing amongst clinicians (1,2). Periodic review of the test repertoire is another important step as it helps the laboratory to identify test or profiles that align with advances in pathology, local needs and national policies. In particular, elimination of obsolete cardiac enzyme assays (creatine kinase-muscle/brain isoform) by replacing them with high sensitivity troponin for diagnosis of myocardial infarction is both cost saving and in accordance with international guidelines.

DM strategies implemented during test ordering are deemed the most powerful (5), especially when execution is via software or computer-based information technology (IT) solutions. Besides being automated, cost-free, and requires minimal effort in sustaining, their effects are constant over time because they are not affected by external factors such as change in staff or clinician requesting habits (5). Software informative tools alert requestors about the characteristics of a test and allow contemplation on whether the request is necessary for a patient (5). Cost display during order entry process (1,4) and electronic pop-up alerts at the point of repeat test order entry (6) are examples of effective informative tools. Alternatively, restrictive tools such as a minimum retesting interval (MRI) gating system allows the blockage of a test which is ordered within the pre-defined time interval to prevent redundancy (5). Although implementation of MRI may differ across laboratories depending on clinical setting, standard recommendations for MRIs can be referred from various published guidelines.

An effective DM tool which can be applied after a test request has been made is test adding. Reflex and reflective testing based on pre-set algorithms identify patients who would otherwise be missed for additional testing (1). An example is the automated addition of free thyroxine as a reflex testing when the initial testing of thyroid stimulating hormone is found to be abnormal. By executing this reflex in the stepwise analysis of thyroid hormones, the laboratory not only prevents test underutilisation by identifying an otherwise missed

thyroid disorder, but also avoids a potential source of test overutilisation because clinicians do not need to order all thyroid hormones at one setting (1).

Despite contributing up to 70% of all health-care decisions, laboratory medicine remains a siloed entity, accounting for less than 5% of the total healthcare budget globally (7). Current fiscal constraints provide even more reasons to integrate DM in daily laboratory practice. Essentially, when pathology testing is maximised, resources can be diverted towards paying for new expansions, developing novel tests and managing the ever-appreciating cost of healthcare.

Given the increasing economic burden of medical expenditure, we hope to spotlight the critical need for efficient and cost-effective pathology testing. In an original research, Rusman and colleagues elegantly contributed their perspective on serum ferritin testing amongst patients with dengue fever, the most common vector-borne viral infection in tropical countries; while Ahmad et al. elucidated findings of a case and control study involving laboratory parameters for coronary artery disease, the leading cause of death globally. We also present the work of many on analytical challenges involved in the diagnosis of rare cases such as co-occurrence of autoimmune haemolytic anaemia and β-thalassaemia major in an infant, extraosseous Ewing sarcoma of the pancreas, cutaneous disseminated zoonotic sporotrichosis and neonatal onset Ornithine Transcarbamylase deficiency.

As 2024 comes to a close, we would like to express our heartfelt thanks to all peer reviewers, MJMHS editorial board and production team. The success of this issue is a testimony to their dedication and hard work throughout the year. We hope you enjoy this issue and wish you a pleasant read.

REFERENCES

1. Mrazek C, Haschke-Becher E, Felder TK, Keppel MH, Oberkofler H, Cadamuro J. Laboratory Demand Management Strategies-An Overview. Diagnostics (Basel). 2021 Jun 23;11(7):1141. doi: 10.3390/diagnostics11071141.
2. Smit I, Zemlin AE, Erasmus RT. Demand management: an audit of chemical pathology test rejections by an electronic gate-keeping system at an academic hospital in Cape Town. Ann Clin Biochem. 2015 Jul;52(Pt 4):481-7. doi: 10.1177/0004563214567688.
3. Zhi M, Ding EL, Theisen-Toupal J, Whelan J, Arnaout R. The landscape of inappropriate laboratory testing: a 15-year meta-analysis. PLoS One. 2013 Nov 15;8(11):e78962. doi: 10.1371/journal.pone.0078962.
4. Fryer AA, Smellie WS. Managing demand for laboratory tests: a laboratory toolkit. J Clin Pathol. 2013 Jan;66(1):62-72. doi: 10.1136/jclinpath-2011-200524.
5. Salinas M, Lopez-Garrнgos M, Rodriguez-Borja E, Blasco A, Carratalб A. Laboratory Test requesting Appropriateness and Patient Safety. Walter de Gruyter: Berlin; 2016.
6. Lapić I, Rogić D, Fuček M, Galović R. Effectiveness of minimum retesting intervals in managing repetitive laboratory testing: experience from a Croatian university hospital. Biochem Med (Zagreb). 2019 Oct 15;29(3):030705. doi: 10.11613/BM.2019.030705.
7. Shaik T, Mahmood R, Kanagala SG, Kaur H, Mendpara V, Gupta V, Aggarwal P, Anamika F, Garg N, Jain R. Lab testing overload: a comprehensive analysis of overutilization in hospital-based settings. Proc (Bayl Univ Med Cent). 2024 Feb 8;37(2):312-316. doi: 10.1080/08998280.2023.2288788.