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Letter to the editor

The future of laboratory medicine: Navigating between technology and professionalism

The interesting paper by Ronda Graves and Colleagues published in the current issue of the Journal explores the future of laboratory medicine in the next decade [1], and represents a laudable effort to provide a forum for discussion on the factors and drivers that may soon change the landscape of our profession. While I read the article with great interest, and agree with most of the viewpoints and perspectives expressed by the authors, I wish to highlight some issues that I believe merit further consideration.

First, the vision of the "current brain-to-brain loop" described by the authors highlights the scant influence of laboratory professionals on the pre-pre-analytical and post-post-analytical components of the testing cycle, thus reflecting a major factor in the current underestimation of the value of laboratory medicine, and its role in modern medicine. Regarding the pre-pre-analytical phase, the authors highlight the current emphasis on direct-to-consumer testing (DTC), particularly in relation to genetic testing, and the trend towards "consumerization" of laboratory testing. However, while the clinician-centric traditional model of test request and result interpretation is switching to a model underpinned by empowered consumers, increasing attention is being paid to the potential risk for patient safety related to this model. Indeed, an alternative, the so-called hybrid laboratory, model [2] has been introduced. This model is a hybrid because it is centric to both the consumer and the clinician, in that the hybrid laboratories facilitate consumer access, but a clinicians (who may be the consumer's regular physician, a physician provided by the laboratory or a laboratory professional) orders the tests and returns the results to users. According to the model, the clinical laboratory is requested to provide an effective stewardship both in improving test request appropriateness, and in result interpretation [3], thus directly involving laboratorians in patient management and care. This in turn, may yield effective tools to rebut current accusations regarding inappropriateness in test request and over-testing, while promoting the rational utilization of laboratory information. In addition, the integration of laboratory tests in care pathways, as stressed by the authors, is effective in assuring the right value and visibility to laboratory medicine and laboratorians as well as in assuring quality and safety to patients. Therefore, I entirely agree with the prediction that the activity (patient care) "will be managed by a multidisciplinary team". The alliance between the patient, the clinician and the laboratory professional, however, calls for a change in the medical (and non-medical) curricula and training to assure new competences and skills to future laboratory professionals [4].

Second, while there is a focus on prerequisites for a SMART (Speed Metrix Automation Remote Technologies) laboratory, emphasizing on the importance of tools such as drones, 3D-printing, and autonomous vehicles, some essential professional issues are somewhat neglected: there is a need, above all to promote standardization and harmonization in the total testing process. If laboratory results and information are not standardized and harmonized, the use of machine learning, big data and, in general, artificial intelligence may not only "intoxicate" many researchers in medicine [5], but may also compromise patient diagnosis and treatment. The mantra "garbage in, garbage out" should be taken up by laboratory professionals and scientific societies in order to more effectively promote projects and programs designed to standardize and harmonize laboratory information [6,7].

Third, another aspect that seems to be undervalued, is the switch of laboratory medicine to the current focus on diagnoses and treatment, to wellness promotion, identification of risk factors, and early diagnoses by using new and innovative biomarkers as well as the contribution to a more "personalized" and precision medicine [8]. This should be achieved not only by adopting "omics" and sophisticated technologies, but also by improving the rationale and appropriate utilization of current laboratory tests.

In conclusion, this paper is a welcome contribution as it stimulates the debate on the future of laboratory medicine and, above all, to ensure that younger colleagues will, in the future, competently face the challenges of the fast changing laboratory scenario.

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