



Laboratory Medicine in the Era of Disruptive Technology

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The creative value: 24-hour clinical microbiology laboratory

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Infectious disease management essentially consists in identifying the microbial cause(s) of an infection, initiating if necessary antimicrobial therapy against microbes and controlling host reactions to infection. In clinical microbiology, the turnaround time of the diagnostic cycle (>24 hours) often leads to unnecessary suffering and deaths; approaches to relieve this burden include rapid diagnostic procedures and more efficient transmission or interpretation of molecular microbiology results. Although rapid nucleic acid-based diagnostic testing has demonstrated that it can affect the transmission of hospital-acquired infections, we believe that such life-saving procedures should be performed closer to the patient, in dedicated 24/7 laboratories of healthcare institutions, or ideally at point of care. While personalized medicine generally aims at interrogating the genomic information of a patient, drug metabolism polymorphisms, for example, to guide drug choice and dosage, personalized medicine concepts are applicable in infectious diseases for the (rapid) identification of a disease-causing microbe and determination of its antimicrobial resistance profile, to guide an appropriate antimicrobial treatment for the proper management of the patient. The implementation of rapid diagnostic tests for infectious diseases will require acceptance by medical authorities, new technological and communication platforms, as well as reimbursement practices such that time- and life-saving procedures become available to the largest number of patients.