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Commentary

The Clinical Microbiology Laboratory is a Component of a Laboratory Medicine Department

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INTRODUCTION

Along with clinical chemistry and hematology, the clinical microbiology laboratory is a component of a laboratory medicine department. It is divided into many divisions, which are housed in the main hospital building and include bacteriology/mycology, serology, virology, mycobacteriology, parasitology, and molecular diagnosis. Over 60 percent of the specimens handled by the clinical microbiology laboratory each year- over 100,000- come from the bacteriology department. The potentially contagious clinical material must be transported quickly and safely. Medically important items are hand-delivered by direct courier to the lab, including CSF and surgically acquired samples. Other for those in glass containers, emergency specimens are securely packed in leak-proof sealed plastic bags and delivered to the lab via pneumatic post. Specimens in glass containers and non-emergency specimens are collected regularly twice or three times a day for all wards and clinics (Fournier PE et al., 2013).

The following actions/procedures have been taken to accomplish this aim:

1. A central admission desk is connected to both the main hospital information system and the computer network used by all major labs (LIS) (HIS). This enables quick verifications of the request's and specimen's natures and the fulfillment of any information that is lacking. The suitability of the material in relation to the specified test(s) and time since sampling are two quality-oriented rejection criteria that are applied to specimens. When a sample is deemed undesirable, the computer system issues a document right away, or the requester receives a call.

2. The constant management of incoming samples lowers the interval between laboratory handling and sampling is shorter the turnaround period (TAT) for sharing the findings of direct specimen inspection, which distinguishes the specimens without losing time, designed for various laboratories, and It expedites all future stages and processes because immediate vaccination using primary culture media (Funke G et al., 1997).

3. We are able to drastically minimize the total number of specimens analysed and consequently the overall cost by applying quality-oriented rejection criteria consistently. Examples of this screening include requests for stool cultures for enteric pathogens in patients hospitalized for longer than three days in the absence of an epidemic problem, requests for mycobacterial culture on CSF samples lacking an increase in white cells, and a rejection rate for sputum Gram stain of 40%. There are additional limitations on cultures from areas near the digestive tract where the Gram stain reveals a mixed faecal flora, anaerobic cultures from areas near mucosal surfaces, bacterial cultures for vaginitis, and antibiotic susceptibility testing for organisms without clearly defined antibiotic resistance mechanisms (Archibald LK et al., 2001).

4. To guarantee a TAT of 60 minutes for issuing a result of direct examination of significant specimens (typically by Gram stain), including fresh un-centrifuged urines, normally sterile body fluids, tissue biopsies, lower respiratory tract specimens, surgical specimens taken in the operating room, and lower respiratory tract specimens. These quick early results have an effect on whether empirical anti-infective therapy is started or modified. A phone call is made to the primary care physician and/or the infectious disease consultant with all highly significant outcomes.

5. Instead of grouping by kind of specimen, the processing of bacteriology cultures (reading, identification, and susceptibility testing) is done by type of patient

(medical services, surgical services, mother infant) (urines, sputa, pus, etc.) This makes it possible for one technician to process all of the specimens from a single patient at once and makes it much easier to compare various culture findings. This method substantially facilitates a synthesis of the many studies by the supervisor and infectious disease specialist.

In several areas of infectious disease management, change is occurring quickly and fundamentally. Clinical microbiology unquestionably plays a significant role in the management of infectious diseases. However, how are microbiologists adjusting to these modifications, and is clinical microbiology itself evolving? On the surface, it appears that clinical microbiology hasn't changed all that much throughout the years. Clinical microbiology continues to primarily rely on bacterial culture for identification and susceptibility testing. As a result, clinical microbiology is still labor- and time-intensive compared to other areas of laboratory medicine. The turnaround time of culture for susceptibility testing and identification is being sped up (Buchan BW et al., 2014).

In contrast to overnight incubation, new technologies are being developed that combine potent optical systems for growth detection in miniature cups with computerized growth pattern analysis to deliver identification and susceptibility testing findings within a few hours.

However, these novel culture-dependent procedures will never outperform the traditional culture-dependent methods in terms of turnaround time. These new culture-dependent techniques won't provide same-day reporting since they will always rely on pure bacterial cultures and never be directly relevant to the sample.

Although antigen and antibody detection may be performed directly on the material, they are only useful in certain circumstances. Despite the early excitement and the extensive literature on their diagnostic utility, gene detection-based approaches have not yet had the dramatic influence on standard diagnostic microbiology that many anticipated (Lagier JC et al., 2015).

CONCLUSION

In several areas of infectious disease management, change is occurring quickly and fundamentally. Clinical microbiology unquestionably plays a significant role in the management of infectious diseases. However, how are microbiologists adjusting to these modifications, and is clinical microbiology itself evolving? On the surface, it appears that clinical microbiology hasn't changed all that much throughout the years. Clinical microbiology continues to primarily rely on bacterial culture for identification and susceptibility testing. As a result, clinical microbiology is still labor- and time-intensive compared to other areas of laboratory medicine. The turnaround time of culture for susceptibility testing and identification is being sped up.

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