

A: APPLICATION OF KNOWLEDGE AND UNDERSTANDING

A1: Demonstrate how you use knowledge, experience, skills and broader scientific understanding to optimise the application of existing and emerging science and technology.

You should provide sufficient detail here to show your deep understanding of your specialist scientific subject and how you have applied it. Further to this, include any examples of where your broader scientific understanding is applied to your area of practice.

Examples could include but are not limited to:

- *Writing and presenting internal papers, reports or standards;*
- *Conducting appropriate research to facilitate design and development of scientific processes;*
- *Writing primary journal articles and patents.*

I am a Senior Biomedical Scientist currently working in the Virology laboratory at [REDACTED] since 2014. I perform molecular tests such as genotyping, resistance, DNA extraction by using Symphony, MDX, EasyMag, EMag, Amplidiag and Cobas p480, preparation of PCR plate on Universal instruments, PCR amplification and analysis on Fisher thermocycler, Taqman 7500, BioFire, BioRad and Cepheid PCR analysers.

I operate Roche Cobas 4800, 8600 and 8800 for HPV, Chlamydia and viral loads. I perform Bordetella pertussis, Mycoplasma and Enteric PCR tests. I also perform fungal tests such as Pneumocystis pneumonia, Aspergillus and Candida molecular tests.

I also work on the manual bench in the serology laboratory where I perform Syphilis and Mycoplasma titration tests. I gained experience of analysers' maintenance, changing the reagents, running normal and QC samples. I have experience to culture organisms in safety cabinet.

Situation: Accurate, fast diagnosis and treatment of Acanthamoeba keratitis and herpetic keratitis are essential to prevent the permanent damage of the cornea and ultimately, loss of sight. Current diagnostic approaches include culture, stains, confocal microscopy and PCR. However, some of these techniques are time-consuming, lack sensitivity, expensive and require further interventions. Acanthamoeba PCR test was not available locally. Therefore, there was an increased demand from the hospital to provide this service.

My task: Therefore, there was an increased demand from the hospital to develop a PCR assay that would save time, resources by providing fast, reliable and accurate diagnosis of keratitis.

My action: As part of my MSc course, I have done a work based research project titled “The development and evaluation of a multiplex real time PCR assay for the diagnosis of Acanthamoeba and Herpes simplex keratitis”. I used primers and probes from Riviera (2006) and Karenin (2006) Acanthamoeba PCR assays to get better sensitivity and specificity for Acanthamoeba whereas HSV primers and probes were used from the in-house Taqman PCR assay. Acanthamoeba castellani and AcroMetrix Multi-Analyte were used as positive controls. RNaseP was used to assess the quality of corneal samples and Roche DNA IC for the extraction process. The assays were optimised and multiplexed together. Six CCAP and two ATCC strains of Acanthamoeba were cultured on Page’s agar plates and used as positive control specimens in the development of this assay. The nucleic acids were extracted on the Roche MagNaPure96 and amplification was performed using the Roche LightCycler 480 PCR.

The performance of HSV was tested with a combination of 13 strong and weak positive HSV clinical specimens. 14 HSV clinical specimens were spiked with Acanthamoeba. Introduction of RNaseP and IC were also tested. The Acanthamoeba and HSV assays were reproducible with CoV of 0.822 and 0.602 respectively. For clinical validation, 50 corneal samples and 60 eye swabs were tested. The assay was 100% sensitive for both Acanthamoeba and HSV whereas the specificity was 98% and 100% respectively. Acanthamoeba is a rare pathogen therefore number of positive are 4 out of 50 corneal samples and this is a limitation of the assay.

	<p>I have presented my project at work to my colleagues as a Powerpoint presentation. I'm in process of publishing this work in IBMS 2022 congress as a poster. I am also in a process of publishing in a scientific journal.</p> <p>Results: Fast, accurate diagnosis of Acanthamoeba and Herpetic keratitis for prompt and effective treatment of the patients.</p>
<p>A2: Exercise sound judgement and understand principles of uncertainty in complex and unpredictable situations.</p> <p><i>This competence is asking you to identify and be aware of the limit of your own knowledge and professional competence, to demonstrate an ability to manage your own strengths and weaknesses and to recognise the level of risk attached to your actions. Examples could include but are not limited to:</i></p> <ul style="list-style-type: none"> • <i>When you have reacted and dealt with an unexpected outcome;</i> • <i>When you have approached a piece of work or project flexibly and in a novel or different way, or reacted to an unexpected outcome.</i> 	<p>Situation: It is my responsibility to look after the fungal bench. I ensure that an adequate number of staff is trained and competent to perform fungal testing. I also make sure that a staff member is allocated and available to carry out the fungal test every week. On one occasion, we were short staffed due to sickness and no adequately trained member of staff was available to do fungal run. In such situation, I performed fungal test myself by re-arranging my workload creating time from reporting bench. Due to Covid19, QIAAsymphony was not available to extract the fungal samples and there was no chance that I could extract the samples day time.</p> <p>My task: To get the fungal samples done as soon as possible and report the results as soon as possible on a cerebrospinal fluid samples (CSF) so that patients can get accurate, effective and on time treatment.</p> <p>My action: Due to unavailability of the QIAAsymphony during the day, I decided to start early next morning and do fungal extraction on QIAAsymphony before day staff starts Covid19 run on the QIAAsymphony. I informed my colleagues working on the Symphony of my plans and instructed them not to turn off the QIAAsymphony machine and also to load the required extraction kit that would save me time.</p>

	<p>Results: I was able to report the fungal results without any delay. My effort and hard work was appreciated by the consultant.</p> <p>Second example:</p> <p>On one occasion, I received an urgent Cerebrospinal fluid (CSF) specimen from a doctor in a childrens hospital after normal working hours. The test request information was incomplete on the request form. The doctor requested only Varicella-Zoster Virus (VZV) PCR test.</p> <p>I used my scientific knowledge and added two further tests (Enterovirus and Herpes-simplex virus PCR) on the specimen for fast and accurate diagnosis of the patient. This was because these viruses are commonly found in CSF specimen. After PCR test, the patient was diagnosed as Enterovirus positive. I informed our medics' team so that the results can be phoned urgently.</p> <p>Using my knowledge and ability to make right judgment in the absence of complete information, I provided fast and accurate diagnosis of the patient. Late diagnosis of Enterovirus may cause problems for heart and brain.</p>
<p>A3: Demonstrate critical evaluation of relevant scientific information and concepts to propose solutions to problems.</p> <p><i>You should think of this competence in terms of selecting the best methodology, the subsequent data analysis, evaluations and conclusions you draw and how</i></p>	<p>I have learned how different scientific papers provided information about PCR tests on Acanthamoeba to diagnose Acanthamoeba keratitis. I have gained knowledge to collect the right information from different sources and then compare it to bring out required information to work on my MSc research project. In critical appraisal, I have selected the best information to inform my project.</p>

you overcome any barriers or issues. Examples could include but are not limited to:

- Engaging in experimental design and testing;
- Reviewing relevant literature, databases, manuals or designs;
- Statistical analysis and numerical modelling.

A review of the literature was performed regarding Acanthamoeba PCR assays and it was found that these assays varied in performance, gene target and internal control. These are summarised below.

Reference Specificity (%) Sensitivity (%) Target Internal Control (IC)

Nelson, 2000 88.6 64.3 N/A N/A

JDP, 2001 91.4 92.9 N/A N/A

Pasricha, 2003 97.8 87.5 18S rRNA Human leucocytes

Riviere, 2006 100 91.7 18S rDNA None

Qvarnstrom, 2006 95 >95 18S rRNA None

Thompson, 2008 100 94 18S ribosomal DNA VZV

Krishna, 2011 99 50 N/A N/A

Maubon, 2012 100 97 18S rDNA beta-2-mgb

Claire, 2015 100 66.7 18S rDNA Albumin gene

Karsenti, 2017 96 100 18S rDNA beta-2-mgb

According to my research, no single assay has good specificity and sensitivity for Acanthamoeba PCR test. Some assays have not mention target gene whereas some assays

have not used internal control. It is better to use more than one assays with maximum specificity and sensitivity to develop new Acanthamoeba PCR assay.

Comparison of different assays:

Riviere, 2006 used only *Acanthamoeba castellanii* (ATCC 30234) as a reference strains to determine limit of detection of the assay. The assay needs to be tested with other strains to determine its sensitivity at broad spectrum. Manual extraction method was performed using wizard SV genomic DNA purification system. The assay was successful to detect 10 copies/ μ l of genomic DNA. There is no evidence of use of internal control.

Karsenti, 2017 used two reference strains (*Acanthamoeba castellanii* ATCC 50739 and *Acanthamoeba castellanii* ATCC 50373) to determine limit of detection (LOD). The LOD was 7 copies/ μ l and 11 copies/ μ l respectively. DNA extraction kit was used manually to extract DNA. The eluate volume was 60ul. There is no evidence of use of internal control.

Ten ATCC strains of *Acanthamoeba* plus 97 clinical samples were tested to evaluate the assay. In 97 clinical samples, 21 samples were detected positive and the remaining 76 were negative for *Acanthamoeba*. The strains detected by the assay were *A. castellanii* (n-6), *A. polyphaga* (n-2), *A. hatchetti* (n-2), *A. lenticulata* (n-2), *A. quina* (n-1) and *A. griffini* (n-1).

Reasons to select both Riviere and Karsenti set of primers and probes to evaluate this assay.

- No single assay provides better detection of *Acanthamoeba*.
- The Karsenti assay detects sensitivity at broader range of species.

	<ul style="list-style-type: none">• The Riviere assay is regarded as sensitive but misses certain types of Acanthamoeba.• Similar PCR thermocycling parameters should allow multiplexing of the two assays• The Riviere has good limit of detection (i.e. 10 copies/µL) and it is used to test clinical samples in some laboratories such as Scottish reference laboratory.• The Karsenti was validated with 97 clinical specimens by the assay published team, demonstrating its clinical utility. Limit of detection is 7-11 copies/µL. <p>Acanthamoeba strains culbertsoni and lenticulata were not detected by Riviere set of primers but detected by Karsenti set of primers.</p> <p>I have shared my findings with clinical scientists, Virology consultant (project supervisor), laboratory manager, medical staff from the hospital and colleagues.</p>
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B: PERSONAL RESPONSIBILITY

<p>B1: Work autonomously and take responsibility for the work of self and others.</p> <p><i>It is important for this competence to ensure you describe your contribution, responsibility and impact on a certain task or project and make it clear what you</i></p>	<p>I possess high work ethics, capable of working to tight deadlines and enjoy a variety of challenges, ability to cope with busy workloads whilst maintaining high standards and attention to detail. I work hard to achieve objectives as well as think logically and scientifically to solve problems. I have the ability to solve problems, tested with continuous problem-solving exercises given as assessments, which may require mathematical analysis</p>
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personally have achieved i.e. "I" not "we". In formulating your answers and giving relevant examples, you should consider the following:

- You will be expected to undertake your work without day-to-day supervision and so you should demonstrate that you are able to achieve this;
- You should demonstrate your understanding of when you may need to seek guidance from others and how you would obtain this guidance;
- If you are responsible for managing the work of others, you should clearly describe how you discharge those responsibilities.

and evaluation. I have successfully undertaken various team projects within both academic and non-academic environments.

Situation: Due to Covid19 Pandemic, there was increased workload in molecular section of the laboratory. Therefore, there was a demand to start 24/7 shifts. One of the senior biomedical scientist who was responsible for routine work, had also joined the night shift. Therefore, it was important to take the supervisory responsibilities in her absence to ensure smooth running of the laboratory.

Task: My task was to supervise fungal, Guthrie cards (GC) and Bordetella pertussis bench to ensure all the tests had been done regularly and the results were reported on time.

My action: I completed level 4 competency on this bench to train and sign competency of other colleagues. I wrote standard operating procedures (SOP), training module and competency on this bench.

I took the responsibilities to manage fungal, GC and pertussis bench. It was my responsibility to ensure that enough number of staff is trained and competent to work on this bench. I arranged training for new staff and sign competency. I checked the stock regularly and replenished stock when required so ruling out the risk of stock shortage avoiding backlogs. I participated in the weekly rota and ensured that every week a staff member was available to work on this bench, at least once a week to get the workload done. I also made sure that when I received new GC kit, I added ethanol in the washing buffer for its stability and suitability of the test. I ensured that washing buffer tubes were ticked to guarantee the addition of ethanol as per protocol.

	<p>I also gave instructions to medical laboratory assistants to process containment level 3 specimens on time and keep the specimens in the fungal designated box in line with local procedure. In the absence of biomedical scientist due to staff shortage, I worked on this bench to perform tests along with my other assigned duties.</p> <p>Results: The workload of fungal, GC and pertussis was done on time to prevent backlog and delay of diagnosis and treatment.</p> <p>I know my limits of practice. I seek help if I'm unsure about anything. For example, there was a sputum sample for respiratory PCR test. The nucleic acid of sputum sample was not extracted on the extraction platform due to instrumental error. One of my colleagues made the PCR plate without releasing that there was a problem with extraction process. At the end of the PCR run, the result was reported as respiratory PCR negative.</p> <p>On re-extraction of sample, the PCR results were completely different than the previously reported false results. Therefore, I seek advice from a consultant and amended the report to authorise the accurate results. I also reported this case as 'incident' on the system to prevent future similar cases.</p>
<p>B2: Promote, implement and take responsibility for robust policies and protocols relating to health, safety and sustainability.</p> <p><i>You should demonstrate that you understand the policies and protocols related to health, safety and sustainability that apply to the work you are</i></p>	<p>During my work I take adequate precautions, follow all departmental health and safety policies with great care at all the time and also adhered to the departmental quality assurance. I am fit mentally and physically to carry out my daily duties in the laboratory. I always make sure the environment around my colleagues and me is safe to work. I wear Personal protective equipment (PPE) all the time in the laboratory.</p>

undertaking giving examples where you have implemented and promoted them and describe any responsibilities that you have related to this. In formulating your answers, you should consider the following:

- Demonstrate that you know where these policies and protocols are documented, and that you are able to apply them in your practice;
- How your work contributes to the update and development of your departments/organisations policies and procedures;
- How you “promote” the awareness and application of these policies and protocols with others, especially peers and more junior colleagues.

I have a certificate of 'Health and Safety for Laboratory Workers Training' provided by Public Health England in 2016. I have completed 'Risk Assessment training' and I perform risk assessment and COSHH assessment and upload on PHE 'safety organiser'. I have experience to review these assessments if there is any aspect that change the current way of practice. I have good knowledge and experience of working safely with category 1, 2 and 3 samples.

I have certificate of 'Fire safety warden' to help my department to rescue in the case of fire. I make sure that fire safety sheet is checked every week to ensure the availability of fire safety equipment and to ensure that all corridors and fire exit routes are clear and hurdle free.

I have experience in writing and reviewing standard operating procedure (SOP), training log and competencies. I have experience in reporting incidents on the electronic incident reporting systems called Ulyssis, Trackwise and Q-pulse. I have performed vertical, horizontal and DOP audits. I suggest changes on Q-pulse if I see a better aspect of quality improvements on SOP.

Each door in the virology laboratory now has security lock that is opened only with a secret password. I always discourage tailgating and the entrance of unauthorized personnel. I have personal username and password for IT system. I ensure that no one knows my password to gain access to patient confidential information.

Situation: The department had new EMag machine which was used for RNA extraction for hepatitis C infection on dried-blood spot (DBS) samples. After instalment, the risk assessment on the machine and COSHH assessment on the reagents need doing. This is required to comply with health and safety legislation and to meet the ISO 15189 requirements to provide

	<p>safe working environment and generate quality results. I inform my manager and the security team if there is any risk of burglary or theft in the department.</p> <p>My task: To perform risk assessment and COSH assessment on new EMag machine and record it on safety organiser and Q-pulse.</p> <p>My action: I attended risk assessment training provided by Public Health England (PHE) and I got a signed competency. I performed a risk assessment in my own time and showed it to a senior member of the staff before recording it on the safety organiser. I also received feedback from my manager and made the amendments before final approval. I also inform my staff about health and safety at work. I ensure that my staff attend annually Health and Safety training.</p> <p>Results: Availability of EMag risk assessment ensures the safe operation of the EMag. This activity helps to meet the ISO 15189 requirement to generate quality results as well as compliance with Health and Safety legislation to provide a safe working environment.</p>
<p>B3: Promote and ensure compliance with all relevant regulatory requirements and quality standards.</p> <p><i>You should demonstrate that you understand which regulatory requirements and quality standards apply to your area of work including data integrity and privacy. In formulating your answers and giving examples, you should consider the following:</i></p>	<p>I perform vertical, horizontal, health and safety audits and DOPs (Direct observation of procedures). During MSc course, one of the modules was 'Quality Systems Management' that broaden my knowledge and understanding about quality in the department. I report and investigate incidents on the Ulysses.</p> <p>I write and review SOP according to the ISO 18159 standards. I have good experience to use 'Quality Management System' to fulfil the requirements of UKAS and to provide quality service to the service users. I perform, assess and report EQA, IQA and IQC results. I also perform environmental swab tests to ensure that there is no contamination in the molecular</p>

- Describe what you do to ensure that these requirements and standards are being followed for those activities for which you are responsible;
- Describe how you “promote” the awareness of regulatory requirements and quality standards amongst peers and more junior colleagues;
- Describe how you safely store and handle data in line with national and international data protection and cyber security regulations.

laboratory and the results generated in the laboratory are accurate and unchallengeable. I also train my staff towards HCPC and ISO 15189 required standards to provide high quality diagnostic service.

Situation: An incident occurred in the virology laboratory where a staff member was potentially exposed to hazard group 3, pathogen – Mycobacterium tuberculosis, (Broncho alveolar lavage -BAL sample labelled as blood serum) due to sending laboratory provided incorrect sample details using old version of the request form.

In our laboratory, the request form was not checked by an experienced member of staff prior to testing. Therefore, the sample was processed on the open bench instead of containment level 3 safety cabinet. The error was identified at the stage of result verification. Further, the patient was diagnosed with TB infection.

My task: To report and investigate the incident to put new measures to prevent future incidents.

My action: I reported this incident on the Q-pulse, Ulysses (Trust) and Trackwise (PHE) electronic incident reporting systems and it was validated by the laboratory manager. The incident was investigated by a quality lead. This is in line with our current incident reporting procedure. It was also in line with recommendation from the Barnes Review of Quality Assurance of Pathology Services, to be open and transparent in reporting incidents (et al Barnes, 2014).

However, the information flow did not stop here. I also reported the incident to the sample sending laboratory so that an investigation could be carried out. I also reported this incident

	<p>to RIDDOR on the Health and Safety Executive. The exposure was risk assessed and therefore the member of staff was referred to the Occupational Health Department for appropriate prophylaxis. Furthermore the incident was reported to CMFT and PHE governance teams.</p> <p>Results: Reporting this incident enabled the risk management team to introduce better controls to prevent further risk. The risk management team ensured that the incident was reported at the Directorate Laboratory Medicine (DLM) Clinical Governance meeting. The risk management team also discussed the incident in the weekly meeting of laboratory senior management team (chaired by laboratory manager), where it was described that the information on the sample was incorrect therefore correct safety procedures could not be followed.</p> <p>It was decided at this stage to review the sample reception standard operating procedures and sample acceptance policy in the virology laboratory at CMFT. The outcome of the meeting was discussed by laboratory managers in weekly team meetings to pass the information to the laboratory staff by team meetings, laboratory up dates and posters.</p>
B4: Oversee the implementation of solutions and demonstrate an understanding of potential and actual impacts of your work on your organisation, on the profession and on the wider community.	<p>The [REDACTED] is collaboration between [REDACTED] NHS Foundation Trust [REDACTED] and [REDACTED]. [REDACTED] provides Clinical Diagnostic Microbiology and Virology services, including Molecular Diagnostics, and is committed to providing a high quality clinical, analytical and advisory service.</p> <p>Specialist services on site include the [REDACTED] Meningococcal Reference Unit and the [REDACTED] Vaccine Evaluation Unit. [REDACTED] aims to consider the needs and requirements</p>

You should demonstrate an understanding of the potential and actual impacts of your work on your organisation, on the profession, on the general public and on the physical environment. Examples could include but are not limited to:

- Indicating that you are aware of the sensitivity of your work and show how this understanding translates into the ways in which you carry out your work;*
- Showing an awareness of how your profession is portrayed and viewed by the public at large, and how you take responsibility for recognising this in the work you do;*
- Describing how you seek to avoid reputational damage related to the work you carry out;*
- Explaining how you set a good example to others in the way you discharge the responsibilities related to the work you undertake and the benefits to the organisation.*

of its users and other stakeholders and to operate in a safe manner for staff, visitors and patients. The Virology laboratory at [REDACTED] is the [REDACTED] main laboratory to provide Covid PCR test.

Situation: At present, the department is lacking proper supervising and organisation of work. This causes problem and delay in diagnosis and treatment of patients.

My task: Bringing positive changes in the department to improve quality and turnaround time.

My action: As a senior biomedical scientist (BMS), I empower band 6 BMS and develop their skills in the involvement of quality and health and safety of the department. I devised a training plan along with the training officer in such a way that band 6 BMS write and review documents such as SOPs, training modules, competencies, perform Quality and H&S audits and report incidents on Ulysses, trackwise and Q-pulse.

I ensured that they do 'root cause' analysis by attending of workshops, meeting and briefings so that they can find the problem and recommend preventive controls to minimise the risks in future. The band 6 BMS should be involved in the annual appraisal of junior staff. Each band 6 BMS supervise a bench and must be responsible for smooth running of the bench.

I also develop Shewhart charts in PCR department for assay controls according to the requirement of ISO 15189.

I regularly participate in vertical, horizontal and examination audits, risk assessment and documents review to achieve and maintain UKAS accreditation.

I arranged a better plan for staff training, stock and waste management. I ensure that staff conforming to ISO 15189 and Health & Safety guidelines for good standard of working practice, so avoids any possibility of reputation damage.

Results: Better quality and safe working environment ensure staff safety and smooth running of the laboratory to generate right result on right time. This will help to build up patient confidence on our service and promote our business.

C: INTERPERSONAL SKILLS

C1: Demonstrate the ability to communicate effectively with specialist and non-specialist audiences.

A non-specialist audience is anyone working outside of your particular area of expertise, so it would not necessarily be a non-scientist. Your example(s) should indicate how you have communicated in a way that is effective to each type of audience. In formulating your answers, you should consider the following:

- *Not just the content of the message but also the mode or style of delivery that is adapted according to the audience;*
- *The feedback loop to gauge the understanding and improve future communications.*

I communicate professionally with my colleagues, visitors, GPs, porters, engineers, consultants and scientists within the laboratory. I also communicate clearly and professionally on the phone. I use terminology that suits different groups of people.

My degree courses and work-based assessments greatly enhanced my written and verbal communication skills due to the many presentations, assignments, posters, assays and projects required. I use these skills in the workplace to make positive difference in the department.

Situation: Acanthamoeba PCR is a new assay which I have developed and validated in the virology laboratory as part of my MSc course. Therefore, I am responsible to provide scientific and technical advice to the hospital staff about specimen type, collection, storage, and transportation in a safe and timely manner along with request form with relevant information. I am also responsible to provide technical and scientific information to laboratory reception staff about specimen processing and request enrolment on the electronic system.

My task: To provide accurate and on time instructions to laboratory and hospital staff about Acanthamoeba PCR test.

My action: I have designed a specimen collection memo discussed in project meeting anticipated by project supervisor, microbiology laboratory manger and consultant ophthalmologist. I provided instructions to the hospital how to request, collect and send the cornea scrape samples to the virology laboratory for Acanthamoeba PCR to preserve the integrity of the sample.

	<p>I also instructed lab reception staff to keep the sample in the fridge and send me a message so that I can further process it. I have been in touch with a reference laboratory for Acanthamoeba tests for validation purpose through post and by email. I have used my verbal and written skills of communication to pass on and share accurate information in a smooth and timely manner.</p> <p>Results: Due to professional on time instructions, I am able to provide the right results on right sample without compromising the quality of the sample.</p>
<p>C2: Demonstrate effective leadership through the ability to guide, influence, inspire and empathise with others.</p> <p><i>This competence is about understanding your leadership skills and is not reserved for those in management roles, it is applicable to all. Examples could include but are not limited to:</i></p> <ul style="list-style-type: none"> • <i>Experiences of mentoring or coaching you have had; you should consider how effective this was and the overall impact;</i> • <i>Considering when you have managed change within your organisation or overseen the implementation of any new processes; you should consider how effective this was and the overall impact.</i> 	<p>I communicate with my team and keep their moral up by appreciating their hard work. I help them and lead by example to achieve the targets. I support them in planning, organizing, coordinating and achieving the personal and professional goals. Due to my calm nature, I am easily approachable and helpful to my team by leading within team.</p> <p>I do not discourage them for their mistakes rather I find the root cause of the problem and solve it by constructive criticism and reflective learning statement. I would make sure that they have access to all the available resources and opportunities to achieve personal and professional goals. I make that their training need is met and they are enjoying working in the friendly environment.</p> <p>Situation: As per department policy, I conducted annual appraisal of one of the medical laboratory assistant (MLA). The MLA was eager to develop his career but he was not sure how he could progress.</p> <p>Task: My task was to give him the best and suitable advice that could benefit to him and the department.</p>

	<p>My action: I told him about the educational opportunities available in the department and I encouraged him that if he did this course, there would be more opportunities to progress further. I informed him about the available opportunities in the department and department's policy to encourage its employees to take these opportunities such as course funding, free time for study, and continuous help from the management and training officer. This valued my knowledge and advice or opinions.</p> <p>Results: The MLA liked my idea and he applied for NVQ course. At present he is doing the course, he goes to university and get some time off from work to do his course work. He is developing more skills that will benefit the department and ultimately help to improve the patient health by providing a better scientific and diagnostic service.</p>
<p>C3: Demonstrate the ability to mediate, develop and maintain positive working relationships.</p> <p><i>You should describe or define the "working relationship" and provide at least one example which focuses on your handling of a challenging interpersonal situation and demonstrates your ability to mediate and achieve a positive outcome. You should consider how through your approach you have changed or modified the behaviour or attitudes of others to positive effect. Examples could include but are not limited to:</i></p>	<p>I communicate professionally with my colleagues, visitors, GPs, porters, engineers, consultants and scientists within the laboratory. I also communicate clearly and professionally on the phone. I use terminology that suits different groups of people.</p> <p>My degree courses and work-based assessments greatly enhanced my written and verbal communication skills due to the many presentations, assignments, posters, assays and projects required. I use these skills in the workplace to make positive difference in the department.</p> <p>I have good professional working relationships with other departments, service providers, engineers and third party for the continuity of diagnostic service.</p>

- How you have managed the merger or integration of different teams;
- Managing working relationships across different departments or organisations;
- Interactions with committees, working groups or other professional body activities;
- How you have managed and resolved a difficult relationship situation between members of a team for which you are responsible.

In recent Pandemic, there was staff shortage due to Covid restriction and excessive workload. I fixed the issue by taking staff from Bacteriology laboratory to work extra hours in the Covid reception. This helped to get the workload done on time.

Situation: It was annual preventive maintenance (PM) of extraction platform called Biomerieux eMag was due in next couple of weeks. Adhering to the ISO 15189 standards, it is essential to carry out regular service of the equipment in the Virology laboratory.

My task: Biomerieux should be contacted to arrange an engineer in appropriate time.

My action: As a senior Biomedical Scientist, I arranged an engineer for the annual preventive maintenance (PM) of EMag extraction machine, mainly used for Hepatitis C RNA screen, HIV, Hepatitis B virus and CMV resistant testing in the Virology laboratory. I phoned Biomerieux using professional communication skills.

I requested to arrange an engineer for PM. I was given two days engineer visit but I requested one day as we were very busy on eMag. It would cause backlog of the work if I agreed two days engineer visit. I offered long a day visit to do the service on same day.

On visit day, I disinfected the eMag, completed a work permit form, received the engineer and gave induction. I also provided him with all necessary PPE.

Results: At the end of day, engineer finished his job and sent me PM report by email. I saved PM record on Q-pulse as part of department quality policy.

	<p>I also have good working relationship with other suppliers such as [REDACTED], [REDACTED] for their support with instrument instalment, repairing and reagent supply.</p> <p>On one occasion during this Pandemic, one of the supplier company was short of a reagent and they had an urgent request from another laboratory. Due to my good working relationship with them, the company approached to me and asked if I can lend the required reagent for a week. I checked my stock and found enough regent to lend. I offered the reagent to the company so that they can supply to the requesting laboratory. I received a gratitude letter from company for helping them in a stressed situation.</p>
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D: PROFESSIONAL PRACTICE

<p>D1: Demonstrate how you scope and plan and manage projects.</p> <p><i>Describe an example where you have developed a project scope with clearly defined boundaries and project plans. Any problem solving techniques used should be highlighted along with potential benefits of the project to the business. You should make it clear the level of autonomy you had while working on the project, especially when the project is large covering multiple</i></p>	<p>I possess high work ethics, capable of working to tight deadlines and enjoy a variety of challenges, ability to cope with busy workloads whilst maintaining high standards and attention to detail. I work hard to achieve objectives as well as think logically and scientifically by planning, organising and better time management to solve problems.</p> <p>I have the ability to solve problems, tested with continuous problem-solving exercises given as assessments, which may require mathematical analysis and evaluation. I have successfully undertaken various team projects within both academic and non-academic environments.</p>
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areas and a significant time span. You should show how you contributed to determining the resulting courses of action. Examples could include but are not limited to:

- Lead an operational project utilising resources across several disciplines;
- A change management project aligning processes across sites;
- An industry-wide project establishing guidance on technical standards and requirements.

Situation: Accurate, fast diagnosis and treatment of Acanthamoeba Keratitis and Herpetic Keratitis are essential to prevent the permanent damage of cornea and ultimately loss of sight. Current diagnostic approaches include culture, stains, confocal microscopy and PCR.

However, some of these techniques are time-consuming, lack sensitivity, expensive and require further interventions. Acanthamoeba PCR test was not available locally. Therefore, there was an increased demand from the hospital to provide this service.

My task: Therefore, there was an increased demand from the hospital to develop a PCR assay that would save time, resources by providing fast, reliable and accurate diagnosis of keratitis.

My action: I have developed and validated a MSc research project titled “The development and evaluation of a multiplex real time PCR assay for the diagnosis of Acanthamoeba and herpes simplex keratitis”.

The key aim of this research project was to develop and evaluate a multiplex real time PCR assay for the diagnosis of Acanthamoeba and herpes simplex keratitis by using all the appropriate validation parameters. The suitability of the assay was assessed by the assay work-up, optimising the primers and probes, selection of master-mix and extraction method, and carrying out limit of detection studies to measure the sensitivity of the assay.

The introduction of this assay as a local service would be considered based on the above criteria. The assay would be performed regularly in our laboratory if the results obtained were deemed clinically relevant. Any interesting or novel observations during the study would also be reported.

Following were the objectives of this project:

- To develop and evaluate a rapid real-time PCR assay for the diagnosis of Acanthamoeba and herpes simplex keratitis.
- A number of real-time PCR assays for the detection of Acanthamoeba would be reviewed by laboratory experimentation for optimal detection with regard to sensitivity, and specificity. Detection of a broad range of Acanthamoeba genotypes was essential. A real-time PCR for the detection of HSV type 1 and 2 was in use at the laboratory for the diagnosis of HSV infections including keratitis. The developed Acanthamoeba PCR assay would be optimized for multiplex PCR detection with the HSV PCR assay. This would include optimization of reagents and thermal cycling parameters and the performance would be assessed with respect to sensitivity, specificity, limit of detection, and assay reproducibility.
- The optimised real-time PCR would be compared to the current culture based method and gold standard for diagnosing Acanthamoeba keratitis.
- Obtain ethical approval (if deemed necessary) for the collection of clinical samples required for this study.
- The developed assay would be assessed prospectively using available clinical material. Corneal scrapes from patients with suspected Acanthamoeba keratitis would be tested in parallel with conventional culture methods.

A final analysis of this study in conjunction with other data would be used to assess the utility of the developed assay to be introduced into the routine diagnostic service.

Project planning

Plan Duration Task

Project Planning Oct - Nov 2018 Procurement of essential equipment.

Sample Testing Nov - Dec 2018 Performing PCR tests

Project Write-Up Jan - Feb 2019 Completion of MSc thesis

Review/Submission Mar - Apr 2019 Review and final submission

Outcomes

Following are the service benefits:

- **Reduced cost.**
- **Fast diagnosis.**
- **Improved treatment of patients with reduced stay in hospital.**
- **Contribution to antibiotic stewardship reducing the use of broad spectrum antibiotics.**

Also improved diagnosis leads to a better understanding of infection and overall infection prevention through improved surveillance and epidemiology.

D2: Demonstrate the achievement of desired outcomes with the effective management of resources and risks.

Using projects with which you have been involved as examples you should describe your roles and responsibilities in managing the activities to achieve the desired outcomes. Examples could include but are not limited to:

- *Identifying the resources (people and/or money) needed to undertake the activities;*
- *Monitoring and surveillance of the progress of the activities;*
- *Identification, evaluation and implementation of changes that may be needed to ensure the activities are successfully completed;*
- *Identification and management of risks that could impact on the successful completion of the activities.*

Situation: Stock management in current Pandemic is a challenge. The shortage of stock causes backlog and delay in turnaround time affecting the reputation of the laboratory.

Task: My task was to provide better stock management for the continuity of the service.

My action: I have undertaken stock management learning at workplace to provide better stock control for the continuity of the service. I have done an assessment on this topic in my master course. Therefore, I have applied that knowledge at my workplace to make a positive difference in saving resources and ensuring stock availability.

I have managed to:

- convince management for a better stock management plan.
- make a plan and discuss it in the meeting
- Plan and design weekly stock check list
- Weekly stock checking, keeping record of it and discussing with seniors in the meeting
- ordering more stock
- chase deliveries
- handle delivered stock and keeping in the appropriate storage conditions.
- query missing/delayed stock with suppliers
- Keep record of all deliveries
- do audit on stock management
- provide stock for the continuity of the service
- generate on-time and accurate results.

	<ul style="list-style-type: none"> - comply with ISO 15189 standards. <p>I have changed the training plan after evaluating the new process. The new training plan was approved by the laboratory manager to provide fast stock management training.</p> <p>Final result: This activity benefits the service user by providing fast and accurate laboratory results for diagnosis and prompt treatment of the patients. The service user gets cost effective and quality diagnostic service. This activity helps to improve the turnaround time as well. All this result in the confidence builds up on our service.</p>
<p>D3: Take responsibility for continuous improvement within a scientific or technical environment.</p> <p><i>Your examples should indicate what actions you take to make improvements to your organisation as a whole. This could be through encouraging the continuous development of junior staff or through improvements to processes within the organisation. Examples could include but are not limited to:</i></p> <ul style="list-style-type: none"> • <i>Evaluation of the performance of specialists methods and tools used;</i> • <i>Development of recommendations for future enhancements or modifications to procedures or</i> 	<p>I perform vertical, horizontal, health and safety audits and DOPs (Direct observation of procedures). During MSc course, one of the modules was 'Quality Systems Management' that broaden my knowledge and understanding about quality in the department. I report and investigate incidents on the Ulysses.</p> <p>I write and review SOP according to the ISO 18159 standards. I have good experience to use 'Quality Management System' to fulfil the requirements of UKAS and to provide quality service to the service users. I perform, assess and report EQA, IQA and IQC results. I also perform environmental swab tests to ensure that there is no contamination in the molecular laboratory and the results generated in the laboratory are accurate and unchallengeable. I also train my staff towards HCPC and ISO 15189 required standards to provide high quality diagnostic service</p> <p>I communicate with my team and keep their moral up by appreciating their hard work. I help them and lead by example to achieve the targets. I support them in planning, organizing,</p>

working practices in order to achieve performance improvements;

- *Description of examples where your actions have led to performance improvement by yourself or others;*
- *Identification of lessons learned from activities undertaken by yourself or by others for whom you are responsible, such as what went well, went badly or was lacking.*

coordinating and achieving the personal and professional goals. Due to my calm nature, I am easily approachable and helpful to my team by leading within team.

I do not discourage them for their mistakes rather I find the root cause of the problem and solve it by constructive criticism and reflective learning statement. I would make sure that they have access to all the available resources and opportunities to achieve personal and professional goals. I make sure that their training need is met and they are enjoying working in the friendly environment.

Situation: As per department policy, I conducted annual appraisal of one of the medical laboratory assistant (MLA). The MLA was eager to develop his career but he was not sure how he could progress.

Task: My task was to give him the best and suitable advice that could benefit him and the department.

My action: I told my colleague about the educational opportunities available in the department and I encouraged him that if he did this course, there would be more opportunities to progress further. I informed him about the available opportunities in the department and department's policy to encourage its employ to take these opportunities such course fee, free time for study, continuous help from the management and training officer.

Results: The MLA liked my idea and he applied for NVQ course. At present he is doing the course, he goes to university and get some time off from work to do his course work. He is developing more skills that will benefit the department and ultimately help to improve the

	<p>patient health by proving better scientific and technical diagnostic service. My knowledge, experience and advice was valued.</p>
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E: PROFESSIONAL STANDARDS

E1: Comply with and promote relevant codes of conduct and practice.

You should provide comprehensive examples of how you have applied and promoted the codes of conduct under which you practice and the outcome.

Examples you may wish to include but are not limited to equality, diversity and inclusion, reliability and integrity and ethical practices.

Situation: It is essential for all biomedical scientists to follow the IBMS code of conduct that comes from HCPC standards of proficiency to provide high standard quality service.

My task: I wanted to broaden my knowledge and understanding about IBMS code of conduct.

My action: I have read the IBMS code of conduct and checked how I follow this code of conduct while working as a biomedical scientist. I have found this information on the IBMS website. The purpose of this exercise is to improve my knowledge and understanding towards my professional duties. Following this code of conduct, I provide best practice while working in the Virology laboratory.

I have found following information:

- It is important to keep professional standard up to date to provide best practice.
- As a professional BMS, I must act in the best interest of service users.
- Confidentiality must not be compromised.
- Must not force others to work out of their limits
- Staff must be competent and work within their limits of practice. Staff must seek advice if unsure about anything.

	<p>- Staff must fulfill their responsibilities towards trainees and must provide sufficient supervision until trainee is competent to perform the task.</p> <p>- Staff must have up to date knowledge and excellent communication skills to share or pass information.</p> <p>I'm a professional BMS who follows the IBMS code of conduct, PHE and NHS Trust values to maintain highest standards of practice and always keep patients first. I strictly follow confidentiality and share information where it is legal to do so in the best interest of patients.</p> <p>I'm a competent BMS and I work within my professional limits. I ask for help if I'm not sure about anything. For example, a specimen received that is not processed in our department; in that case, I'll speak to the consultant.</p> <p>I know my responsibilities towards trainees and I do not allocate a task to a trainee until he/she is competent to perform that task. I provide better management to my staff and always ensure that they work in a comfortable environment by carrying out Health and Safety audits.</p> <p>I regularly follow CPD activities to keep my knowledge up to date by attending presentations, lab meetings and journal clubs. I have excellent communication skills to share the information in a precise and accurate manner.</p>
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	<p>I always show great respect towards my colleagues, visitors and patients. I strictly follow local and national equality and diversity policies at work, learnt from PHE and Trust mandatory training. I don't put anyone at a disadvantage or treat them unfairly.</p> <p>I report risk and incidents to keep the working environment safe. I cooperate with my colleagues and other service users to pass on information to improve patient health.</p>
<p>E2: Demonstrate a commitment to professional development through continuing advancement of your own knowledge, understanding and competence.</p> <p><i>Your answer should provide specific examples of what you have already done in terms of continuing professional development (CPD) and your plans for the coming year. In your examples you must describe how your engagement in CPD has benefited your practice and the users of your work and reflect on its impact.</i></p> <p><i>Examples can be taken from any of the five categories of activity (work based learning, professional activity, formal/educational, self-directed learning and other).</i></p> <p><i>e.g.</i></p> <ul style="list-style-type: none"> • <i>Application of knowledge acquired on an external course that has benefitted the</i> 	<p>I keep my knowledge and understanding up to date by participating in the CPD courses. I regularly use IBMS CPD courses such as participation in IBMS annual conference, IMBS online CPD activities, work based lunch time meetings, seminars and journal clubs. I also use eCPD application of the Royal College of Pathology to improve my knowledge. In 2015, I attended IBMS annual three day's conference. I participate in CPD activities because it is also a requirement from IBMS and HCPC to meet their standards of high quality.</p> <p>I have completed two work-based portfolios plus two CPD diploma provided by IBMS. My first portfolio was in Blood sciences for HCPC registration. I completed this portfolio in my own time working as a Medical laboratory assistant. So I had to make my own opportunities to get proper BMS training.</p> <p>First of all, I read the IBMS training book to understand it. I also looked through a previous pre-registration portfolio to get a better idea. I had a meeting with my training officer and discussed better ways to complete the portfolio in the given time period. I planned my work and focused on one topic at a time. I collected relevant information and evidences from books, scientific journals, internet, intranet, colleagues, training officer, previous portfolios,</p>

- business – how you acquired the knowledge of a new technology and how you planned, implemented and reviewed its success in your organisation;*
- Your work to promote careers in the STEM area including the design of materials and reflection on success.*

We are not looking for a list of courses here but evidence of how your CPD benefits your practice and benefits others.

(Note registrants will need to comply with the Science Council CPD Standards)

and relevant standards operating procedures, presentations and journal clubs. I used to get feedback on my work from my training officer every month.

I made electronic and hardcopies of the portfolio. However, I prefer electronic portfolio which is easy to organise, save, amend, access and of course to carry.

I learnt that portfolio is a good way to express specific knowledge and understanding of a role supporting with good evidences. It is also used to assess knowledge, understanding and competency of the candidate in short time. It is also used in career progression and as CPD evidence.

My second portfolio was in Virology laboratory for specialisation. This portfolio required specialist knowledge, understanding, competency and evidences of the discipline. It was also used for the reasons specified in above.

My third and fourth portfolio were an IBMS CPD online diplomas which were used to show evidence of my CPD while working as a BMS. I collected the evidences from different sources and wrote reflective statement for each piece of evidence. I liked the idea of writing reflective statement because it made me think more thoroughly about the purpose of the activity and how it can benefit the patient health.

The purpose of the portfolio's to allow me to develop knowledge and skills of my practice so that I can contribute in the implementation of laboratory procedures to generate quality laboratory results to improve the patient health.

CSci
Chartered
Scientist

