Report from the chief examiner and chief moderator

T Level Technical Qualification in Healthcare Science (Level 3) (603/7083/X)

Summer 2023 – Occupational specialism (Assisting with Healthcare Science)

Chief Examiner's and Chief Moderator's Report

Summer 2023 – Occupational Specialism (Assisting with Healthcare Science)

Assessment dates: [**P001970, P001971 and P001972: 31 March 2023 – 19 May 2023**]

[**P001973: 18 May 2023 9.00am**]

Paper number: **P001970, P001971, P001972 and P001973**

This report contains information in relation to the externally assessed component provided by the chief examiner and chief moderator, with an emphasis on the standard of student work within this assessment.

The report is written for providers, with the aim of highlighting how students have performed generally, as well as any areas where further development or guidance may be required to support preparation for future opportunities.

Key points:

- grade boundaries
- standard of student work
- evidence creation
- responses to the assessment tasks
- administering the external assessment

It is important to note that students should not sit this external assessment until they have received the relevant teaching of the qualification in relation to this component.

Grade boundaries

Grade boundaries for the series are:

	Overall
Max	500
Distinction	364
Merit	294
Pass	225

Grade boundaries are the lowest mark with which a grade is achieved.

For further detail on how raw marks are scaled and the aggregation of the Occupational Specialist element, please refer to the qualification specification.

Standard of student work

Moderated assignments

Paper numbers P001970, P001971 and P001972 are referred to as assignments 1, 2 and 3, respectively and were internally assessed by provider appointed assessors and externally moderated by NCFE appointed moderators. Assignments 1 and 2 assess the student's ability to perform a range of clinical assessments on patients whereas assignment 3 assesses the student's ability to prepare for and carry out several scientific tests within the laboratory setting on patient samples.

Overall student attainment was high across the cohort for all 3 assignments, and it was clear that they have been well prepared and provided with opportunities to develop their skills. Video and other evidence clearly shows some student practice at times was excellent and exemplary in some cases. It is evident that these students have benefited from ample occasions to develop skills across a range of areas such as communication (verbal and non-verbal), planning, carrying out instructions, and clinical and laboratory skills. In addition, it is clear where students have scored more highly, they are fully engaged and invested in their studies and have taken advantage of opportunities to practice both manual and mental dexterity required to master many of the skills required. Students achieving lower marks did not display consistency in their practice and often lacked some of the specific skills to be a holistic practitioner, for example, in infection control, liquid handing or patient-centred care.

Nevertheless, it was pleasing to see that such a diverse range of skills had been successfully developed by many students across the healthcare and laboratory settings. In addition, students demonstrated a level of professionalism not usually seen in such age ranges. This is evidence that the providers are preparing the students well in line with industry standards on competence and codes of conduct.

Externally assessed assignments

It was great to see that the vast majority of students attempted all 4 tasks. Overall though, students have not performed as well in assignment 4 compared with assignments 1, 2 and 3. Students appear to have struggled with writing high-demand extended responses under timed examination conditions.

There was a recurring theme of students directly lifting text from the scenario without adding any additional value. It would be beneficial to work with students on honing their examination technique. The tasks in assignment 4 are comparable to those set in the GSEMs. Using this exemplar work, associated mark schemes and examiner commentary as part of student revision should help students to better understand what the examiner is looking for and how to construct their answers in a way that best showcases their knowledge, skills and understanding.

Evidence creation

Moderated assessment

Assignment 1, 2 and 3 moderation relies on a plethora of assessment records. These include observation record forms completed by the provider appointed assessors as well as audio-video recording showing students completing all tasks, photographic evidence showing personal protective equipment usage and work areas prepared by students for each measurement taken and a final mark form. In addition, completed patient record forms and Laboratory Information Management System (LIMS) spreadsheets from students were required. To assist providers in collating this evidence a checklist was provided. The best example of providers who collated and supplied all required evidence efficiently were those who used the checklists.

Templates were provided to assist assessors to complete observational record forms and contained a range of relevant objectives (skills and actions) that should be considered when adding comments, along with indicative content. In all instances these templates were used. In the best examples a detailed written narrative was submitted that when used in conjunction with video/photographic evidence, fully justified the marks awarded by the provider appointed assessors to most students. The narrative in these instances almost reconstructed the assessment by giving specific examples of practice to allow confident moderation. For instance, rather than note that ‘the student displayed patient-centred care’ the assessor included examples of the language used and the context, stating that the ‘student ensured that the patient had time to recover normal breathing between attempts, reassuring them to take their time and not rush the test, checking if they felt ok between each breath’.

Submitted completed patient record forms and LIMS spreadsheets from students were crucial to evidence the students’ ability to record measurements accurately using appropriate units and manage information.

Video evidence generally was good quality, however, in some instances the video did not show key areas of practice for observation by moderators. For example, for the blood pressure task (assignment 1), some students were filmed from the back, which occluded the view of their clinical practice, thus video evidence of all tasks completed could be improved by providers.

External assessment

The majority of students submitted typed responses to all tasks with some students submitting handwritten responses. Both were acceptable and students using supplementary answer sheets helpfully remembered to link these additional pages to the relevant tasks.

Providers should ensure when scanning and uploading student work that they do not cut off any part of their student responses. Some providers used a PDF generator that had a visible watermark across student work. If providers use these, again, they should ensure that all parts of student work remain clearly legible.

Responses to the assignments

Assignment 1

Task 1a: prepare for peak expiratory flow (PEF), blood pressure (BP) and spirometry measurements.

This task was complex in nature as it required the students to have factual and procedural knowledge and understanding of all the tasks in this assignment and be able to identify and select the appropriate methods and equipment to carry them out. They also needed to display their theoretical knowledge and understanding of the equipment by ensuring calibration and checks were carried out. As a result, we saw a wider variation of practice amongst students.

Nevertheless, most students showed confidence in selecting the correct equipment in an efficient manner, which was excellent to note. Most students also displayed their understanding of the need for equipment calibration and checks to ensure that accurate clinical measurements are obtained. In examples where students did not perform as well, more emphasis was required on this aspect to ensure accurate clinical data was collected to inform patient treatment options reliably.

Most students demonstrated that they had a good understanding of infection control by their use of personal protective equipment (PPE) and cleaning of equipment and environment, however, see later points on this aspect.

Task 1bi: perform and record PEF measurement

Students were well drilled on how to perform PEF measurements and the role play challenged the communication skills of the students to formulate clear and correct instructions to enable the patient to carry out the test accurately. It was excellent to see that in the best examples, students did this with confidence. In examples where students did not perform as well, limited or unclear instructions were given to patients that led to the collection of potentially inaccurate results. Another common mistake was that students did not consider the impact of the patient posture on the ensuing results. Communication skills could be improved with more opportunities to verbalise instructions using formative exercises.

Most students demonstrated that they had a good understanding of infection control by their use of PPE and cleaning of equipment and environment. However, some students did not utilise face masks/shields within the setting of a respiratory clinic as an infection control mechanism and as a result performed less well. In addition, improvements could be made by considering the process of disposal of contaminated equipment more carefully. In examples where students did not perform as well in this aspect, they contaminated self, other equipment and the environment with used mouthpieces. Emphasis should be given to the immediate disposal of used mouthpieces via clinical waste or via an intermediary receptacle to prevent contamination of other equipment, environment and self.

Task 1bii: carry out a manual BP measurement on the patient and update records

Students achieving the highest marks were able to clearly demonstrate how their knowledge of the procedure and human anatomy informed their practice, for example, by placing the lower edge of cuff 2 to 3cm above the brachial artery and locating the radial pulse and using palpation to determine maximum cuff inflation pressure required. In addition, their communication with the patient illustrated a patient-centred care approach.

In examples where students did not perform as well, often clinical practice was sufficient for an accurate BP measurement to be made but there was limited or no communication with the patient during the procedure, providing no opportunity for ensuring patient comfort and wellbeing.

Task 1biii: assist the practitioner with the spirometry measurement on the patient and record findings accordingly

Differing scenarios were provided for this observational assessment between providers. Some required their students to assist a practitioner as outlined in the assessment brief, whilst other students carried out the spirometry measurements themselves. Both provided sufficient opportunity for the students to meet the relevant criteria. Nevertheless, in future all providers should follow the assignment brief.

The criterion that students found most challenging was patient-centred care (communication, comfort, consent). The highest scoring examples of practice included students who gave clear and accurate instructions, considered contraindications, considered current medications (with a specific focus on respiratory medications) and those that offered patient-centred care. This task also focuses on the ability of the student to communicate their procedural and theoretical understanding in a professional context. In examples where students did not perform as well, communication was unidirectional by the practitioner. Providers should consider providing opportunities to develop professional conversations in the context of such scenarios to build student confidence in this area. As noted in task 1bi, communication skills could be improved with more opportunities to verbalise instructions using formative exercises and indicative content should be used as a guide in this process.

Task 1c: carry out post-measurement cleaning and storage of equipment

This task was generally performed well by students. It tests a smaller more distinct range of knowledge and skills, and this is reflected in the marks available. Nevertheless, the mark scheme could identify where students were not performing as well, for example, where students omitted to clean down the environment after cleaning and storage of equipment and those did not remove their PPE appropriately, jeopardising infection control. It should be noted that students who mastered these skills were able to maximise their marks throughout all subsequent assignments in which this is a component part and thus students should be given the opportunity to practice and hone these skills.

Data management throughout all tasks was deemed as good, with the highest scoring students utilising units, and stating date and time of test results and including a signature to ensure traceability. These students also displayed an understanding of the implications of the findings and were able to reassure patients about any subsequent course of action.

OVERALL SUMMATION: The cohort have performed well in assignment 1 across all providers and they have been well prepared and been provided practical opportunity to develop their skills. Video and other evidence clearly shows some student practice was excellent and exemplary in some cases. Students achieving lower marks did not display consistency in their practice and often lacked some of the specific skills to be a holistic practitioner.

Assignment 2

Task 1: assist with specimen collection and point of care test (POCT)

In this task students were required to prepare for the collection of a urine mid-stream specimen and complete a specimen collection. Students were also requested to carry out a urine dipstick test on the collected sample and send another sample for microbiology testing, before recording and reporting the results and carrying out post-examination cleaning and storage of equipment. So, this task required students to demonstrate their clinical skills, infection control, further testing, management of information and data, post task cleaning and workplace care and patient-centred skills.

When preparing self and the workstation, most students showed confidence in selecting the correct equipment in an efficient manner and utilised appropriate PPE and handwashing technique. The best examples of this practice also included the checking of the date of expiry of the dipsticks and thorough cleaning of the equipment and the area, ensuring effective infection control. Pleasingly all students selected the correct container/tube indicated in the test requirements for appropriate specimen preservation.

The role plays again challenged the communication skills of the students to formulate clear and suitable instructions to enable the patient to carry out the sample collection appropriately. It was excellent to see that in the best examples, students did this with confidence. In examples where students did not perform as well, limited or unclear instructions were given to patients that led to the collection of a potentially contaminated sample.

Student's performance showed that they found completing a urine dipstick test the most challenging. Students achieving lower marks did not utilise a timer when carrying out the test and recorded urine dipstick results inaccurately or in an ambiguous manner, which may have led to misinterpretation of the results. Conversely higher scoring students showed precise data recording and also displayed an understanding of the need for appropriate storage necessary to maintain the integrity of the specimen and, consequently, the test results.

Post task cleaning and workplace care was generally performed well by students. Students who did not perform as well were those who omitted to clean down the environment after cleaning and storage of equipment and those who did not remove their PPE appropriately, jeopardising infection control.

Task 2: carry out point of care test (POCT)

In this task students were required to prepare for a blood glucose test including explaining the procedure to the patient and to carry out this test before recording and reporting the results and carrying out post-examination cleaning and storage of equipment. So, this task required students not only to display factual, procedural and theoretic knowledge when carrying out a clinical procedure, but they also needed to demonstrate patient-centred skills. As a result, we saw a wider variation of practice amongst students.

Most students showed confidence in selecting the correct equipment in an efficient manner and thoroughly cleaned equipment and area. Hand hygiene was adequate and correct use of PPE was noted. Some students also displayed their understanding of the need for equipment calibration and checks. Where students did not perform as well, they omitted to calibrate the blood glucose meter, or check the expiry date of the glucose strips prior to use. Workstation set up and equipment calibration should ideally be carried out before patients are invited to enter the role play to ensure this gives the students enough time to complete these important quality assurance activities. In addition, this reduces waiting time for the patient, which many increase anxiety.

In the best examples of patient-centred care, students checked the patient's hands to see if they were warm and if not asked them to rub their hands together briskly to warm them up to promote vasodilation and obtain a good blood sample. They also asked the patient if they preferred the test to be done on a particular finger.

The procedure was clearly explained to the patient and the patient wellbeing was checked throughout the procedure.

Most students were able to use the blood glucose monitor effectively to obtain a measurement, and good examples recorded these measurements accurately with units. Mixed practice was seen when preparing the skin for lancing, such as the use of alcohol rubbing gel, alcohol wipes and handwashing, which were all acceptable, however, some students failed to ensure the puncture site was cleaned and dried.

Post task cleaning and workplace care was generally performed well by students. As previously, students who did not perform as well were those who omitted to clean down the environment after cleaning and storage of equipment and those who did not remove their PPE appropriately, jeopardising infection control.

Data management throughout both tasks was deemed as good, with the highest scoring students utilising units, and stating date and time of test results and including a signature to ensure traceability. These students also displayed an understanding of the implications of the findings and were able to reassure patients about any subsequent course of action. Those students scoring less well often did not use the correct terminology when reporting results in particular the dipstick test, which may lead to confusion.

OVERALL SUMMATION: The cohort have performed well in assignment 2. However, there was a spread of attainment that illustrates that some students did not consistently display their factual, procedural and theoretic knowledge throughout the 2 tasks. Nevertheless, again all students displayed a level of professionalism when dealing with patients, and many students were able to effectively demonstrate their skills and knowledge when performing the assignment.

Assignment 3

Task 1: microscopy and Gram stain

This task involved students preparing slides using the patient sample cultures and carrying out Gram staining following a standard operating procedure (SOP) provided. Gram status of the samples was obtained via microscopy and results were recorded and communicated to a biomedical scientist. Disposal of materials and cleaning equipment and work area was then required.

To generate the sample slides, cleaning of the area and self was important to maintain aseptic technique. Better examples of student practice displayed all these features throughout the procedure. Many poorer scoring students did not maintain aseptic technique throughout and therefore may have compromised the patient results. Mastering aseptic technique requires developing both manual and mental dexterity that can only be developed through practice offered by the provider.

Gram staining was performed well by most students who demonstrated the ability to accurately follow a SOP, illustrating good laboratory skills. Mixed practice was observed in student use of microscopes. The best examples were those students who focused the specimen using a lower objective first, then rotated the turret so the objectives straddled the specimen to apply the oil and rotating the 100x objective into the oil before fine focusing.

Post-task cleaning and workplace care was generally performed well by students. Students disposed of glass slides appropriately and stored stains and solvents correctly. Best scoring students were those who paid attention to the fine details such as cleaning the microscope and the lens and storing the patient samples appropriately.

Management of information and data and communication skills with the biomedical scientist were good with most students scoring highly.

Task 2: specimen analysis – blood

This task involved students preparing patient samples and reference curve material for ELISA following a SOP, including completion of a LIMS spreadsheet, pre- and post-analysis activities and communication with a biomedical scientist. These test a complex mix of student skills and understanding and are therefore good determinants of a range of abilities.

Best student examples illustrated confident and accurate use of pipetting and liquid handling skills and precise examination of patient sample suitability and labelling. Conversely some students displayed inaccurate use of a pipette, which led to erroneous sample preparation. This is a necessary skill for all students to master. Perhaps formative exercises focusing on accuracy and precision could be developed to assist students.

Data entry onto the LIMS spreadsheet was generally good. Where students failed to score more highly, one or more details were omitted and/or the student had failed to utilise the concentration and units of the standard curve in the 96 well plate, referencing instead to a, b, c or 1, 2, 3. Communication with the biomedical scientist was professional across all students; however, some students displayed a lack of confidence in precisely what they needed to report.

OVERALL SUMMATION: Assignment 3 scores across providers shows that most students have been able to demonstrate that they have attained the skills and knowledge required to perform the assignment to a good standard. However, a level of uneven practice is seen between students.

Assignment 4

Task 1

Students performing well in this task addressed each aspect of the task in a separate paragraph. In one paragraph they discussed the importance of adhering to a computed tomography (CT) system maintenance schedule. The next paragraph focused on the risks to patients and staff when schedules are not maintained. In the third paragraph they considered specific examples of how regular maintenance could mitigate the risks. Their final paragraph considered how different teams contribute to the maintenance of the CT systems. Answering in this methodical way is an example of the exam technique practice students would benefit from as previously mentioned. It ensures that all areas are covered, enabling students to achieve in the higher marking bands.

In this task, students frequently repeated information provided within the scenario brief without adding their own input. For example, students simply restated the relevant health and safety acts, IRR17 and IR(ME)R without explaining why these legal requirements have been put in place and who they protect. Many students stated that ‘ionising radiation’ was dangerous but were unable to elaborate on specifically how exposure to x-rays would be harmful for the patient and operator.

All students included information that was clearly relevant and contextualised to the task but most responses lacked the depth of understanding required to access the higher marking bands.

Task 2

Some students provided an easy-to-follow step by step calibration method, either written in continuous prose or using a numbered system.

Students used the information in the table to identify if the scales were accurate or not and were also able to provide a rationale for the decision that they made. Students used various methods to calculate accuracy, not all of which were suitable. Some students, for example, instead of using the acceptable error tolerance at each mass recorded (to determine the accuracy the scale), used a mean calculation of the total recorded masses. This method was similar to the one described in the 2021 GSEMs that could indicate that students

have revised and followed this method without reading the task brief closely. Other students took the mean of each mass category and then checked to see whether the mean value was in or out of the stated tolerance.

Some students struggled to see how 3-point calibration that encompassed a high, middle and low range check could help to provide proof of accuracy of the scales over a greater range. Some students conflated the concept of a 3-point calibration check with repeating a reading 3 times to calculate an arithmetic mean.

When considering how correctly calibrated devices contributed to clinical safety, not all students were mindful that the test was being carried out on portable baby scales. It is important that students use the context of the specific scenario under consideration in their extended responses. For example, some students were able to comment on how incorrectly calibrated baby scales may result in incorrect dosage of medication being calculated/administered to the baby and the implications of this.

Task 3

It was evident which students had detailed knowledge of how to perform a basic (daily) maintenance cycle on a urine analyser, as they were able to accurately describe the activities they would undertake. Students who did not demonstrate this level of knowledge were still able to describe how they would follow the relevant SOP to test the equipment, gaining marks for describing the actions they would take when handling the faulty device.

Mostly students focused on the key information that would need to be reported to a senior member of staff. Only a few students were able to discuss following an institutional logging process or completing the relevant fault paperwork.

The best answers were from students who were able to discuss the entire process from performing the daily maintenance checks, how they noted and recorded the fault (with consideration of how urgent the task is and if a replacement was deemed necessary) and the full process of how they escalated the fault to a senior manager.

Task 4

Overall, the research and innovation extended written task was performed very well by students. Students were able to confidently demonstrate their familiarity with the Health Research Authority (HRA) approval process and had a high level of understanding of informed consent. Students presented their answers in a variety of different ways, allowing for creativity in the formats students chose.

Those responses that were able to access the higher marking bands were those which clearly included information from each of the 7 areas in the task. These students were able to identify the most pertinent details from the scenario and included these within their patient information leaflet. For example, under patient involvement, students were able to include information about the duration of the research project (8 weeks) and summarise the specifics about the diagnostic testing process. Therefore, those students who were able to perform well avoided simply retyping extensive extracts from the scenario but demonstrated an excellent ability to select the elements that a patient would find most useful and discussed their inclusion within the leaflet.

Student commonly referred to accessibility solely in terms of accommodations that would be in place for those with impaired physical needs for example, mentioning ramp access to the blood clinic. A limited number of students were able to demonstrate a broader understanding through their discussion of different formats (different coloured backgrounds, font sizes, languages) for the leaflet or the use of interpreters if necessary.

Some students explicitly referred to the General Data Protection Regulations (GDPR). However, few students were able to consider how the GDPR safeguards impacted the personal data collected from the patient and how it would be processed during the research project and beyond.

Administering the external assessment

The external assessment is invigilated and must be conducted in line with our Regulations for the Conduct of External Assessment.

Students must be given the resources to complete the assessment, and these are highlighted within the Qualification Specific Instructions for Delivery (QSID).