Despite being involved in the vast majority of diagnostic decisions, pathology continues its work under a cloud of misunderstanding and anonymity; however, at a recent meeting of the IBMS Manchester branch, Chief Executive Jill Rodney stated her determination to change this “behind the scenes” perception. One very clear message that has come out of the recent IBMS membership survey is that we need to do more to raise the profile of the profession. Institute President Derek Bishop has encouraged all IBMS members to think about what they can do to highlight the key role that biomedical scientists play in patient care, to other health colleagues and to the public.

Many excellent initiatives, aimed at promoting awareness of the profession, already exist but clearly members feel there is more to be done. At Robert Gordon University (RGU), we believe that a good place to start this process is during the training/education of all future healthcare providers through the process of interprofessional education (IPE).

**WHAT IS INTERPROFESSIONAL EDUCATION?**

Interprofessional education is facilitated when students from different health and social care disciplines come together to learn. The UK-based Centre for the Advancement of Interprofessional Education (CAIPE) states that “Interprofessional education occurs when two or more professions learn with, from and about each other to improve collaboration and the quality of care.” The benefits of interprofessional working at the undergraduate level have been shown to be wide-ranging. Through IPE, students develop an early awareness of the role of other healthcare professionals and understand more clearly where their profession ‘fits into’ the healthcare team. This is especially important for those health professionals, like biomedical scientists, who are generally not seen on wards or in clinics by patients and fellow healthcare professionals. Barr and colleagues summarised the four most likely benefits of interprofessional education to be:

- enhanced motivation to collaborate
- changes in attitudes and perceptions
- cultivation of interpersonal, group and organisational relations
- establishment of common value and knowledge bases.

It is the second of these points, namely the bringing about of changes in attitude and perception, that is often the most challenging aspect of IPE. It is somewhat disconcerting to find, even at the undergraduate level, that barriers to successful communication among healthcare professionals exist as a result of professional stereotyping.

Interprofessional working aims to prevent these barriers being built up in the first place, or to remove them where they exist. It is our experience that the setting of ‘ground rules’ for all IPE activities is an effective way of avoiding these pitfalls. These rules emphasise the importance of each profession in the health and social care spectrum, where all professions are considered equal, where mutual respect is promoted, and professional stereotyping is avoided.

**INTERPROFESSIONAL EDUCATION IN ABERDEEN**

The delivery of IPE in Aberdeen is unique in Scotland, in that we have a shared IPE partnership across both universities in the city: RGU and the University of Aberdeen. It started in 2003 when a one-year NHS Education for Scotland (NES)-funded pilot project was developed by the School of Pharmacy at RGU and the Medical School at the University of Aberdeen. The aim of this project was to develop and deliver a common, shared learning programme for undergraduate and professional qualifying courses in medicine and pharmacy. The IPE remit has since expanded and the aim of current Scottish government-funded project is to develop and deliver a common, shared learning programme as and where appropriate to undergraduate and professional qualifying courses across all health and social care subjects at both universities.

Biomedical scientists are a fundamental part of any healthcare system yet they continue to be hidden members of the team. One remedy to this situation could be interprofessional education, as Jeanette Robertson and Sundari Joseph explain.

The integrated course structure meant that it was possible to introduce IPE activities both into university- and placement-based modules’
Staff involved in the development and delivery of IPE include lecturers from schools in the Faculty of Health and Social Care at RGU and the School of Medicine and Dentistry at Aberdeen University, and also clinical/practice educators. These groups work together to identify and develop areas of the curriculum where IPE could become embedded. Figure 1 illustrates the schools and professions involved in the current Aberdeen IPE project.

**INTRODUCING STUDENTS TO INTERPROFESSIONAL EDUCATION**

The BSc (Hons) Applied Biomedical Science course at RGU has both IBMS accreditation and Health Professions Council (HPC) approval. It is an integrated degree which has been designed in partnership with biomedical scientists within NHS Grampian, NHS Highland and the Aberdeen and North East Scotland Blood Transfusion Service. An integrated academic and professional training framework has been developed to provide a progressive pathway through which students are able to complete the IBMS Certificate of Competence registration portfolio, which meets the HPC Standards of Proficiency for biomedical science. Students on this course benefit immensely from the hands-on laboratory experience they gain while on placement. During an initial six-week placement in Year 2, students receive a one-week ‘taster’ of each laboratory discipline and then spend an extended period of time in two disciplines of their choice while on a 14-week placement in Year 3. In order to integrate IPE into the current programme of study, members of the course team, along with NHS staff and the joint university IPE lecturer, worked together to identify and develop areas in which IPE could become embedded. The outcome of these consultations was the development of an Applied Biomedical Science student IPE journey (Fig 2) in which students undertake one or more IPE activities throughout each year of study.

**TYPES OF ACTIVITY**

The advantage of having an integrated course structure meant that we were able to introduce IPE activities into university- and placement-based modules, which benefits students and also NHS staff who participate in facilitating the activities. Interprofessional education is most effective when delivered as a mixture of formal and informal learning activities, and the biomedical science student IPE journey reflects this mix. Some of the activities are undertaken with all the IPE student groups within the Faculty of Health and Social Care; however, some profession-specific activities have also been designed. As part of the informal activities, students are assigned to an IPE ‘buddy group’ that comprises students from each profession. Buddies are encouraged to interact with each other informally via shared intranet space between the two universities. It is recommended that they begin with a friendly ‘hello’ posting to the rest of their group, explaining who they are and their professional role. This early ‘getting to know you’ dialogue is useful when it comes to the Year 3 IPE activity, where engaging with buddies is a requirement for a more formal IPE learning activity.

All IPE activities are facilitated by qualified facilitators, usually academic and NHS staff, who have been trained in mixed group facilitation and who are familiar with the IPE materials used in the Aberdeen IPE programme. After each IPE activity, all students are required to complete a post-activity questionnaire (Table 1), and biomedical science students are also asked to write a reflective statement on the activity for inclusion in their Certificate of Competence registration portfolio. Interprofessional education is being phased into the course and to date only Year 1 and Year 2 activities have been undertaken.

**INTERPROFESSIONAL EDUCATION IN YEAR 1**

Students are introduced to IPE early in Semester 1 of Year 1, when they are invited to attend a basic life saving (BLS) course...
delivered by medical and nursing students. This informal peer-learning activity not only gives students a gentle introduction to IPE, it also equips them with an important life skill they would not have acquired as part of their course.

In Semester 2 of Year 1, all first-year students come together for a workshop. The venue chosen for this particular activity this year was Aberdeen Football Club stadium where staff and students had the opportunity to watch some team training and to have a stadium tour. The aim of the workshop was to generate an appreciation of professional identities and to promote interprofessional teamwork and communication. To set the scene for why IPE is important in the health and social care curricula, students listened to examples of real patient stories addressing quality aspects of optimum care. Examples were also shown of where care pathways had fallen short of this standard and how, in most cases, this was due to lack of communication between healthcare teams. Learning, which consisted of informal team-working activities, was achieved in small groups of 10–12 students, with facilitators from the different professions represented. Biomedical science students who reflected on the activity stated that they enjoyed the opportunity to meet other healthcare students and felt it enhanced their understanding of the importance of interprofessional working.

‘Feedback from the initial IPE activity was positive, with students reporting definite improvements in their interprofessional team-working skills’

**YEAR 2: SAMPLE PATHWAY WORKSHOP ACTIVITY**

In Year 2, biomedical science students were introduced to the first of their profession-specific IPE activities, which took the form of a ‘sample pathway’ workshop. This activity was undertaken during placement, in conjunction with nursing and medical students who were also on placement at that time. During a two-hour workshop, students were asked to consider the journey a patient sample takes, from initial test requesting to the communication of results back to the patient, and the role their profession plays in this journey. They were encouraged to discuss any problems they had encountered with this process, and to consider ways of dealing with them.

After initial introductions, the activity got underway and learning was achieved in small groups (five or six students) in which each professional role was represented. After a tentative start, the interaction within groups soon became lively and productive. Students were keen to discuss the problems they had encountered with the process, and were even more eager to find solutions. Interestingly, the main issues raised by all students were around sample quality and transcription errors. Biomedical science students discussed the problem of receiving samples in the laboratory in an unacceptable condition (eg leaking, sample in wrong container, or insufficient sample volume).

Medical and nursing students discussed the difficulties in obtaining certain sample types, in particular from the elderly and the very young. They also raised the issue of sample turnaround times, and all groups discussed the problem of lost or delayed samples and the impact this has on patient care. Specific student comments on the activity, taken from the post-activity questionnaire, are given in Table 2. There was overwhelming agreement in all student groups that the main solution to these problems was better communication between professional groups; as one biomedical science student commented: “It is important to share knowledge of individual professions for the greater good of patients.”

The main aim of this session was to foster interprofessional collaboration between students in relation to the processes involved in inborn errors of metabolism: activity with fourth-year pharmacy students. Students also equips them with an important life skill they would not have acquired as part of their course.

**Fig 2.** The IPE Applied Biomedical Science student journey to interprofessional working.
when dealing with diagnostic laboratory services for patients, and this certainly appeared to be achieved. Figure 3 shows that most students either ‘agreed’ or ‘strongly agreed’ that team-working skills are vital for all health and social care students (Q5) and that shared learning before qualification will help students to become better team workers (Q17). Nursing and medical students felt that the activity gave them a greater understanding of the importance of obtaining a good-quality sample, and biomedical science students commented that the activity had given them a better awareness of the difficulties experienced by medical and nursing staff when taking patient samples. They also stated that the activity had created a greater air of understanding and cooperation when considering sample acceptance.

One biomedical science student summed this up well by saying: “It was a great help to communicate with other professions. It has made me aware that they have as many problems with getting samples, so empathy is needed in the laboratory, especially with the sample acceptance policy. But in the end all the paperwork needs to be filled out for the patient to get the best care possible, the first time.”

SUCCESSFUL INTERPROFESSIONAL EDUCATION

The main learning outcome of this activity was to recognise each profession’s role and responsibility in relation to test ordering, sample collection and analysis, and communication of results to the patient. While it is desirable that learning outcomes are achieved, it is also important that participants enjoy the activity. Our aim is to make interprofessional working an agreeable activity, one in which each member of the team feels valued and respected. It should not be met with fear or suspicion.

There was overwhelming praise for the activity from all student groups, and comments written on the post-activity questionnaire clearly show that all participants thoroughly enjoyed this activity and did indeed feel valued and respected.

One biomedical science student commented: “It definitely encourages respect between professionals and showed how we can work to help each other.”

The success of this activity can be attributed to several factors; however, the fact that it was undertaken in a placement setting could be key to the positive outcome. Placement-based IPE activities have been shown to be more successful in terms of promoting behavioural and attitudinal changes among undergraduate students. “Certainly, in our sample pathway IPE activity, students appeared to approach it from a ‘professional’ perspective rather than a ‘student’ one. Comments from all student groups (Table 2) show that through this activity they were able to see the benefits of collaborative working, the importance of the cultivation of interpersonal relations, the establishment of common values and knowledge bases, and, perhaps most importantly, some attitude change was evident, particularly from one very honest student who commented: “It has given me a clearer picture of the role of other professionals in patient care. It will make me reconsider before blaming any of them in the future.”

Table 2. Examples of student responses from the post-activity questionnaire following sample pathway IPE activity.

<table>
<thead>
<tr>
<th>Biomedical science students</th>
<th>Nursing students</th>
<th>Medical students</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoyed having the rather informal chat with doctors and nurses. I feel I have not only benefitted myself but also made a good contribution in helping them to understand better what is required.</td>
<td>It gives an insight into all the other roles of the multidisciplinary team and the importance of communication.</td>
<td>Gave very good insight into working of laboratories, meeting the people behind the results, and logistics and practicalities of ordering and receiving tests and results.</td>
</tr>
<tr>
<td>It has been very helpful to see how other professions – doctors, nurses – work and how our role in the laboratory can help them.</td>
<td>Very useful, as we got to understand what happens when the specimen is tested and what happens when the label is filled out incorrectly, and the implications of this.</td>
<td>I found the organisation very useful and helped me understand that all of us have a role to play in dealing with samples. It is important to communicate with each other as well.</td>
</tr>
<tr>
<td>The IPE activity was extremely insightful and furthered my professional understanding of nursing and medicine with relation to samples taken from patients.</td>
<td>Interesting to find out why samples are rejected and what could be improved.</td>
<td>It is a great opportunity to clear doubts/difficulties experienced in ward/medical centres as well as learning other team members’ points of view. The involvement of the professionals helped to make discussion more meaningful. This activity would definitely help me to carry out my roll better. Thank you.</td>
</tr>
</tbody>
</table>
‘There was overwhelming praise for the activity from all student groups, and participants thoroughly enjoyed the experience and felt valued and respected’

One of the main reasons for bringing IPE to the biomedical science student portfolio is that of inclusivity. As biomedical science educators, it is our aim to highlight to undergraduate biomedical science students the important role they play in patient care, and to ensure that they feel an essential and valued part of the healthcare team. The sample pathway IPE activity gave biomedical science students an opportunity to ‘showcase’ their profession to other healthcare students, and they appeared to welcome the opportunity to do so. One nursing student commented: “I really enjoyed today’s session. As a nursing student, I was unsure about what happens to the samples after they leave the ward. The biomedical science students had lots of knowledge to share, and the topics were very interesting to learn.”

As a result of this activity, biomedical science students clearly felt valued and respected members of this team. The comment from one student – “I learned a lot about other professional roles and how we are all linked” – was gratifying to hear. If future biomedical science students enter the profession with this outlook and attitude then, through IPE, we have achieved our aims.

The authors would like to acknowledge all NHS and university staff who helped with the organisation and facilitation of IPE activities. Particular thanks are due to Julia Lassier and Lynne Stout (nurse practitioners, Scottish National Blood Transfusion Service, Aberdeen) and Fiona Sellers (chief biomedical scientist, Aberdeen and North-East Scotland Blood Transfusion Service training manager) for their invaluable help and support with the sample pathway activity. Finally, thank you to all the students for their participation and feedback.

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Professional Doctorate in Biomedical Science: a University of Portsmouth update

During the 2011–12 academic year, 11 students from the Professional Doctorate in Health and Social Care programme at the University of Portsmouth, including three from the biomedical science pathway (DBMS), were awarded their doctorates.

Yasin Abdü
Dr Yasin Abdü, (senior biomedical scientist, Bart’s Health NHS Trust, The Royal London Hospital) undertook a professional research and development project entitled The appropriateness of clinical microbiology laboratory investigations: a retrospective study of the cost and clinical relevance of specimen management and processing. Specifically, he looked at the types of specimen that were submitted and the tests that were requested, and he found that they were often inappropriate. As a result of the outcomes from the work, several changes have been introduced to make the microbiology service more clinically relevant and cost-effective.

Aderemi Adelugha
Dr Aderemi Adelugha (senior biomedical scientist, Scarborough Hospital) investigated The assessment of reticulocyte and erythrocyte haemoglobin contents and their use in the evaluation of iron status in hospitalised patients. The project aimed to improve the laboratory diagnosis of iron deficiency and anaemia of chronic disease in hospitalised patients. The use of reticulocyte and erythrocyte haemoglobin contents in a diagnostic algorithm can improve the accuracy of the assessment of iron deficiency, facilitating earlier identification and treatment, thereby resulting in better outcomes for the patients.

John Kenning
Dr John Kenning (specialist biomedical scientist in microbiology, Leeds General Infirmary) wrote a thesis on In vitro synergy of tigecycline and other antimicrobials against Burkholderia cepacia complex and other non-fermentative Gram-negative bacilli from cystic fibrosis patients. This work aimed to enhance the knowledge of combination therapy for patients with more complex infections where pathogens are resistant to multiple single antibiotics. The practical and clinical implications of combination therapy were investigated in order to improve and prolong the lives of cystic fibrosis patients.

Ongoing success
Professor Graham Mills (professional doctorate programme manager) congratulated all three DBMS students on their success and said that the three professionally-based research projects will have real impact on pathology, patient care and service delivery. The university now has witnessed nearly 50 professional doctoral graduates, including 17 from the biomedical science route, emerge successfully from the programme since it was inaugurated 12 years ago.

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