

Addressing Training Needs and Professional Advancement: A Postgraduate Study Day for Subspecialty Training

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Abstract

Postgraduate training is a process by which trainees make transition from working under supervision to independent practice. Trainees achieve professional advancement through everyday training at the workplace, learning at organised educational activities and mentoring from supervisors. In this paper, we present our experience in organising a postgraduate study day for the Paediatric Immunology and Infectious Diseases (PIID) subspecialty. Principles of adult learning were applied to enable interactive, group-based collaborative learning through trainee-led case discussions and interactive seminar. The Faculty provided feedback to the trainees by objective scoring of their performance. Evaluation from the trainees on the PIID Study Day was positive and self-perception on knowledge in the diagnosis, pathogenesis, investigations and management on infectious diseases in immunocompromised hosts and primary immunodeficiency syndromes increased after the event. The success of this form of postgraduate training activity depends on learners' motivations, the educators' experience and perspectives, and the learning environment.

Key words

Education; Professional development; Subspecialty training

Introduction

Postgraduate medical education encompasses the delivery of a training curriculum and implementation of assessment systems.¹ This applies to both general and subspecialty training. Curriculum is not only defined by aims

and objectives, content, experiences, outcomes and processes of the programme, but also the *structure and methods* of learning, teaching, feedback and supervision.¹ The learning environment and organisational culture needs to value and support education and training so that learners are able to demonstrate what is expected in good medical practice and to achieve the learning outcomes required by the curriculum.² Learning takes place at work, as well as organised education sessions, training days, courses, inputs from trainers and other informal learning opportunities, facilitated by the provision of protected time, resources, facilities and appropriate educational supervision.

The Hong Kong Society for Paediatric Immunology and Infectious Diseases (HKSPIID) was established in May 2006. Since 2008, HKSPIID organises the Annual Scientific Meeting (ASM) comprising the Bill Marshall Memorial Lecture and Roland Levinsky Memorial Lecture delivered by distinguished speakers in the field of paediatric infectious diseases and immunology, respectively. The ASM takes place on the Saturday following the Paediatric Infectious Diseases and Immunology course, which is organised by

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Princess Margaret Hospital and the Hospital Authority Infectious Disease Control Training Centre, in conjunction with HKSPIID. These consecutive days of meetings constitute an important continuous medical education (CME) activity for paediatricians with special interests in immunology and infectious diseases to update their knowledge and clinical practice.

In 2012, the subspecialty of Paediatric Immunology and Infectious Diseases (PIID) was accredited by the Hong Kong College of Paediatricians, and 12 paediatric specialists were admitted as PIID first fellows. In 2013, our first PIID trainee commenced his subspecialty training and currently we have 5 PIID trainees undergoing training in 4 hospitals. Apart from clinical training provided by designated PIID trainers, log sheets and project assignment, it is important that a structured programme targeting to the training needs are organised for the trainees. This year, a PIID Study Day was organised for the first time for subspecialty trainees, providing a unique educational experience for professional advancement.

Design

I. Objectives

The PIID Study Day is a structured, clinically-oriented training activity targeted for trainees. The objectives include the following:

1. To present updated knowledge on paediatric immunology and infectious disease problems
2. To conduct in-depth discussions on the management of children with immunological and infectious diseases
3. To promote shared learning among trainees working in different hospitals, and interactive discussions with the Faculty

II. Programme Rundown

The trainee session in the morning consisted of short case presentations by the trainees, and an interactive seminar given by one of the overseas speaker. The ASM started after lunch break, with the Roland Levinsky Memorial Lecture and the Bill Marshall Memorial Lecture as keynote lectures. The former lecture was delivered by Prof Bobby Gaspar on 'SCID: from 100% mortality to 100% survival in 50 years', and the latter was delivered by Prof Stanley Plotkin on 'Vaccination: successes, hurdles and failures'. A short presentation on patient advocacy was given in between the two memorial lectures, and the Vice-President of the recently established patient support group

'Primary Immunodeficiency League' Mr Geoffrey Yu was invited to talk about the journey and the achievements made by the patients.

III. Participants

The target participants are PIID subspecialty trainees, members and young fellows who are interested to understand more about the PIID subspecialty, as well as nurses. Participants were invited to submit an abstract of a case that they wish to present, and the abstract must include up to 3 key learning issues identified by the presenter. Trainees were asked to seek advice from their training supervisors on the content and accuracy of their case presentation.

Altogether, 8 doctors and 1 nurse participated in the PIID Study Day. Among the doctors, 5 were PIID subspecialty trainees. The 3 non-PIID subspecialty trainees included one higher trainee who helps looking after patients with immunological diseases in her hospital, one basic trainee who intends to join PIID subspecialty, and one colleague from HKU-Shenzhen Hospital who specialises in paediatric immunology. An Advanced Nurse Practitioner (APN) specialised in immunology and rheumatology also participated. The PIID Study Day was open to all doctors and nurses for registration as audience. CME and Continuous Nursing Education (CNE) credits were approved by the Hong Kong College of Paediatricians and Hong Kong Paediatric Nurses Association, respectively.

IV. Faculty

The Faculty was formed by two overseas experts (Prof Bobby Gaspar and Dr Vas Novelli, Great Ormond Street Hospital for Children NHS Foundation Trust, UK), and local senior clinicians with extensive teaching experience (Prof Yu-Lung Lau and Dr Mike YW Kwan). Together they formed an expert panel (two immunologists and two infectious disease physicians) and acted as leaders in the discussions of the instructive cases presented by the trainees. In contrast to most CME lectures where interactions between the speaker and the audience are limited, we encouraged that *the Faculty and participants should relate with one another as educators and learners.*

Facilitating Active Learning: A Trainee-Centred Approach

I. Setting

The morning session took place in a hotel function room.

A 'U-shaped' seating configuration was adopted for the Faculty and the trainees at the front (Figure 1), while the audience were seated in rows at the back. Such a seating arrangement facilitates cooperative learning, and encourages interactions among trainees and with the Faculty. The Faculty were seated at the same level as the trainees, thus shifting from teacher-centred to student-centred mode of learning (Figure 2a). All trainees were in direct eye contact and are naturally connected with the Faculty and their fellow colleagues as one entire unit.³ Participants naturally engaged in the interactive discussion as they felt being part of the group, allowing them to take control of their learning. The set up provides a positive environment and reassurance for expressing ideas.⁴

II. Case Presentation

Each presenter was given 10 minutes for case presentation, followed by 5 minutes of discussion on the key learning issues identified. The theme for this year's PIID Study Day focused on patients with proven or suspected primary immunodeficiencies (PID), and the cases ranged from management of opportunistic infections in immunocompromised patients, PIDs with no definitive molecular diagnosis such as EBV-related lymphoreticular disease, neonatal haemophagocytic lymphohistiocytosis and early-onset bronchiectasis with combined immunodeficiency, next generation sequencing for diagnosis of PID, subcutaneous immunoglobulin (SCIG) replacement therapy and haematopoietic stem cell transplantation (HSCT) for established PID. These real case scenarios provided the context within which the Faculty educated the trainees on the approach to immunological evaluations and pitfalls in laboratory test interpretations, how not to miss diagnostic clues, and follow-up actions for cases without a molecular diagnosis. The combination of immunologists and infectious disease experts in the Faculty was essential, as both elements were present in all the cases. Case presentations illustrating the application of whole exome sequencing, home immunoglobulin replacement with SCIG and novel HSCT protocols broadened the trainee's perspectives on advanced, novel diagnostic and therapeutic options.

III. Interactive Seminar

One of the overseas speakers (Prof Gaspar) gave a talk "Severe combined immunodeficiency: A self help guide to clinical and immunological diagnosis". Using a series of short case scenarios, trainees were asked to give answers for data analysis, photographic interpretation, diagnostics

and management approach. The emphasis was not just to arrive at the correct molecular diagnosis, but through these cases trainees learnt to understand the basics of PID classification, how immunophenotype is linked to genotype, the principles of management, and to be an astute clinician. The information presented in the talk was on practical issues in clinical immunology which is rarely taught in the undergraduate curriculum and seldom discussed in such a format in journal articles or reference books, and were thus of great interest to trainees (Figure 2b). The U-shaped seating configuration allowed the teacher to come forward to engage each trainee (Figure 2c). Trainees were helped to arrive at the diagnosis through reasoning and critical thinking, in a non-threatening environment.

IV. Feedback

A scoring scheme was designed for the Faculty to evaluate the performance of the case presenters, as shown in Table 1. The scoring criteria were based on the CARE (case report) checklist 2013, which is a consensus-based clinical case reporting guideline.⁵ The guideline provides a set of essential items for authors to consider when submitting a case report for publication, and offers a structure for case-based learning in healthcare education. Modifications were

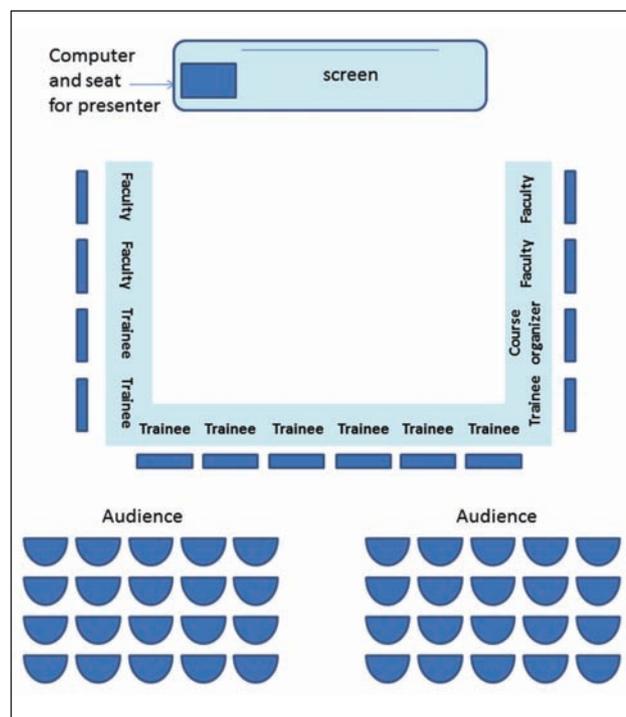


Figure 1 Seating arrangement to facilitate cooperative learning.



Figure 2 The PIID Study Day. a) Faculty seated with the trainees at the same level, listening to a case presentation; b) attentive learners; c) trainee answering and raising questions to speaker during the interactive seminar; d) group photo of the Faculty and presenters of the PIID Study Day; e) informal discussions during tea break; f) nurses participating in the PIID Study Day; g) trainee supervisors from 4 different hospitals; h) Patient representative and Vice-President of PID League Mr Geoffrey Yu giving a talk on patient advocacy; i) networking among trainees, PIID fellows and invited speakers and j) PIID trainees and HKSPIID society members at dinner gathering, with Geoffrey in the middle.

made so that the scoring items were relevant to an oral case presentation instead of a written case report, thus aspects such as the ability to demonstrate problem-solving skills, critical thinking and effective communication during the discussion with the panel and audience were included. Altogether there were 10 items, with a maximum score of 10 for each item making up to a total score of 100. Apart from being an objective assessment, more importantly the scoring scheme served as a form of feedback to the trainees. The trainees received the scoring sheet at the end of the PIID Study Day, and they were encouraged to write up their cases for publication after taking the Faculty's comments into consideration, with reference to the CARE guideline.

Evaluation

Participants were invited to complete an on-line evaluation after the PIID Study Day. They were asked to rate, from 1 (poor) to 5 (excellent), on the scientific and practical content, the case presentations by fellow trainees, the interactive seminar, the two memorial lectures, the talk on patient advocacy, and other aspects such as interaction with the Faculty, networking and the meeting venue. The response rate was 100% from the 9 presenters, and the result is shown in Figure 3a. Majority of participants gave a rating of 'excellent' to all domains, especially on scientific content, case presentation by trainees, interactive talk, networking and the venue, indicating a high level of satisfaction. The memorial lectures and patient advocacy talk were relatively less popular, suggesting that active participation was more preferred by the trainees.

We asked the trainees to evaluate their perceived level

of knowledge in 4 aspects – 1) diagnosis, 2) pathogenesis, 3) investigations and 4) management on 2 domains: infectious diseases in immunocompromised hosts and primary immunodeficiencies before and after the PIID Study Day. From a scale from 1 (poor) to 5 (excellent), an increase in a score of 1 or 2 was given in 71.8% of responses for the 'infectious diseases in immunocompromised hosts' domain, while an increase in a score of 1 or 2 was noted in 87.5% of responses for 'primary immunodeficiencies'. The average scores were significantly higher after attending the PIID Study Day on almost all aspects in the 2 domains (Figures 3b and 3c), except pathogenesis in PID ($p=0.06$). In contrast, the self-perceived increase in knowledge about diagnosis and investigations for PID was highly significant ($p<0.001$), reflecting deficiency in these areas prior to the education intervention.

Trainees gave very positive feedback to the PIID Study Day. Many described it as an enjoyable experience and learnt a lot. The following are citations of written comments about how the trainees felt the PIID Study day was helpful to their practice:

"Interaction with Prof and trainers – illustrative cases."

"The interactive session and quiz is very helpful! Must be continued!"

"It is helpful to build up a clinical sense to pick up suspected immunodeficiencies. It is also helpful in a sense that audience can be exposed to a wide spectrum of immunodeficiency syndromes."

"Sharing of cases by medical practitioners enhance the understanding on the clinical pictures of patient with immunodeficiency and increase our alertness on picking up possible cases. Sharing by patient also let us to know more about these patients."

Table 1 Scoring of case presentation by trainees

Criteria

1. Clarity and organization of the presentation
 2. Able to highlight pertinent clinical features and diagnostic results which are relevant to the diagnosis with reference to a timeline
 3. Data interpretation
 4. Diagnostic reasoning including other diagnoses considered
 5. Able to comment on the type(s) of therapeutic intervention, rationale and clinical outcome
 6. Able to provide a management / follow-up plan
 7. Discussion of relevant medical literature
 8. Clear rationale for conclusions
 9. Take-home message: importance and impact on clinical practice
 10. Discussion with panel and audience
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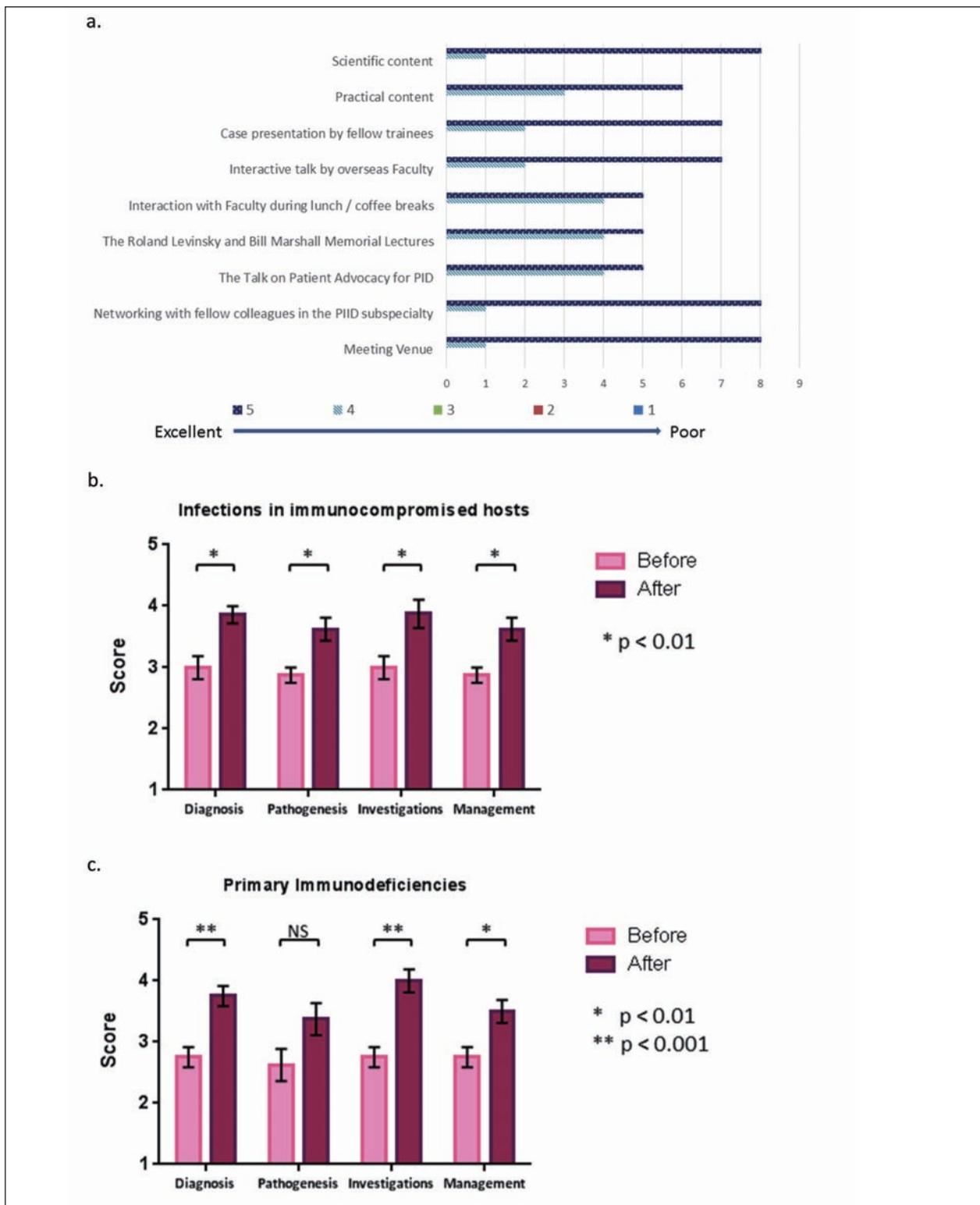


Figure 3 Evaluation on PIID Study Day by trainees. A) rating on various aspects of the PIID Study Day on a scale of 1 (poor) to 5 (excellent); b) self-perceived level of knowledge on 'Infections in immunocompromised hosts' before and after the PIID Study Day; c) self-perceived level of knowledge on 'primary immunodeficiencies' before and after the PIID Study Day. Data are shown as mean +/- SEM. Statistical analysis was performed by Students' t-test using GraphPad Prism 5.0.

"Structured foundation lecture by Prof Bobby Gaspar was great for foundation laying, but case presentations and discussions also very useful to learn about approaches to diagnosis and management!"

Trainees also provided suggestions on future improvements. The most frequent request was more time for case presentation, which was corroborated by the overrun of the morning session by 45 minutes. One trainee suggested more practical lectures. These reflected that our trainees are highly motivated to learn and have a strong quest for knowledge, providing an important incentive for us to expand the half-day trainee session to a full-day programme.

Discussion

We report our experience in organising the first PIID Study Day for paediatricians and nursing colleagues. Emphasis was placed on self-directed learning, active participation and feedback. Learning was organised around real case scenarios rather than a subject matter, and was oriented to problem solving. The learning process started right from the time when the trainees studied their selected case for presentation, wrote the abstract and identified the key learning issues with their supervisors. Supervisors gave them guidance on both the content and slide presentation style / format. Therefore, the PIID Study Day is not just an event for the trainees, but is also for senior members of our profession. The cases presented by the trainees brought in a diversity of experience and expertise from different hospitals for mutual learning. Furthermore, it serves to attract potential trainees who are interested in PIID to have a 'taste' and understand more about the subspecialty, and provides opportunities for them to obtain information and advice from current trainees and supervisors.

In Malcolm Knowles' theory of adult learning, the adult learner is assumed to have the following characteristics: 1) having an independent self-concept who can direct his or her own learning; 2) having accumulated a reservoir of life experiences that is a rich resource for sharing; 3) having learning needs oriented to tasks of his / her changing social roles; 4) is problem-centred and interested in immediate application of knowledge and 5) is motivated to learn by internal rather than external factors.⁶ These underlie the principles of andragogy, which is the art and science of helping adults learn: 1) adults need to be involved in the planning and evaluation of their instruction; 2) experience (including mistakes) provides the basis for the learning

activities; 3) adults are most interested in learning subjects that have immediate relevance and impact to their job or personal life and 4) adult learning is problem-centred rather than content-oriented.⁷

Several pedagogical strategies are commonly used in clinical medical education, namely 1) lecturing, 2) demonstrating, 3) intervening, 4) piloting, 5) prompting, 6) supplementing, and 7) questions and answers.⁸ The pedagogical style is teacher-centred; the teacher assumes full responsibility for what is taught and how it is learned. The focus of learning is to build a foundation of knowledge that may be useful in future contexts. Andragogy is learner-centred, and the focus is more on application of knowledge and development of competency for immediate use. The balance between pedagogical and andragogical approaches depend on the learner's knowledge level, the educator's perspectives.⁹ In undergraduate education, more often the teacher needs to take control of the learning process to ensure that the learners have a solid knowledge base. For postgraduate education, a greater weighting should be given to andragogical approaches by mobilising our trainees' own clinical experience and self-reflection during the process of professional development. This is in contrast to many CME activities consisting of didactic lectures, where most of the participants in the audience are passive learners. CME activities adopting a 'Grand-round' style are increasingly popular. This format promotes some participation from the audience and interactions with the speakers, but the content is pre-determined by the speaker and not driven by the audience. CME activities for career grade clinicians should be distinguished from postgraduate training, which aims at supporting the transition from training to independent practice, and has to meet the dynamic change in training needs at different stages of the trainees' development.

The PIID Study Day draws the experience from other post-graduate training for immunology and infectious diseases around the world. The Walter Marget Workshop runs alongside with the Annual Meeting of the European Society for Paediatric Infectious Diseases. The full-day educational workshop includes keynote lectures, and 4 breakout sessions on different clinical themes during which trainees give case presentations and receive comments from the Faculty. For primary immunodeficiencies, 2 prestigious residential summer schools are organised by the European Society for Immunodeficiencies and the Clinical Immunology Society in the United States. These summer schools usually last 4-5 days, during which the Faculty and trainees stay focused and have ample opportunities for close interactions and networking. Outside the classroom, the

Faculty often provides mentorship for trainees by giving advice on training and career progression, which can be life-changing. Our PIID Study Day adopted a 'semi' summer school style. Though not to the extent of being a residential course, we started at 8am for breakfast when trainees, organisers and the Faculty came to know one another, providing a 'warm-up' before the formal programme. Trainees had time to interact with the Faculty and other seniors at tea breaks (Figures 2d & 2e), and some took the opportunity to seek advice on overseas training during 'happy hour' drinks (Figure 2i). They build up a close network and friendship at lunch and dinner get-together (Figure 2j). These are unmeasurable benefits gained from an educational event.

The PIID Study Day was attended by doctors and nurses, and both CME and CNE accreditation were obtained. One APN presented her experience in training the parents of an infant with X-linked agammaglobulinemia on home administration of SCIG, the first case in Hong Kong. This was a valuable opportunity for the medical trainees to learn and understand about advanced nursing practice. The participation of nurses in our PIID Study Day (Figures 2a & 2f) also brings out an important message, that professional training and team-building for doctors and nurses is essential for subspecialty development. Another element of the PIID Study Day was Patient Advocacy – a patient speaking to an audience of medical professionals from his own perspectives, and the achievements that were made possible through patient empowerment (Figure 2h). The message we wished to bring out was that patient is the centre of clinical practice and scientific advances, the ultimate driving force for professional advancement. The paper 'Role of the patient in medical education' by the Medical Education Subcommittee of British Medical Association highlighted examples of good practice and provided recommendations on involving patients in postgraduate and Continuing Professional Development courses.¹⁰ This can be achieved by integrating patient experience and stories into training programmes, in order to help doctors better understand the impact of care on patients, their needs and what they expect from their doctors.¹¹ In fact just 1 week before the PIID Study Day, 3 PIID trainees participated as patient facilitators in the PID Awareness Day and Inauguration Ceremony of PID League, the patient advocacy group for primary immunodeficiencies in Hong Kong. To increase the 'visibility' of patients with rare diseases is an important way

to promote awareness among young doctors during their early stage of training.

To summarise, the PIID Study Day presents a wide spectrum of learning activities, from trainee-led presentations, interactive seminar, didactic lectures sharing from patient's perspectives and social interactions. We are determined to continue this format of training for our trainees, with thematic rotation to allergy and common paediatric infectious diseases in future events. Postgraduate study day is only one form of training activities and the full spectrum of learning opportunities in subspecialty training and supervision should be defined, while ensuring the provision of appropriate facilities and resources to facilitate these training programmes. Effective systems of educational governance and leadership to manage and control the quality of education and training are needed. Trainees should also be encouraged to develop educational leadership role during their training, so that they can become future trainers with educational capability and credentials. The role of clinical educators in paediatric subspecialties should be recognised, and education research should be encouraged.

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Conflict of Interest

The authors declare no conflict of interest.

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