The Professional Development Year (PDY) for Australian and New Zealand Nuclear Medicine Scientists

Final Report prepared for the Accreditation Board of the Australian and New Zealand Society for Nuclear Medicine (ANZSNM)

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Executive Summary

In early 2010 the Australia and New Zealand Society for Nuclear Medicine (ANZSNM) decided to review perceptions within the profession of the Professional Development Year (PDY) that all new graduates in nuclear medicine are required to complete prior to full registration as Nuclear Medicine Scientists (NMSs). A questionnaire was widely distributed among the NMS community asking about several aspects of the PDY. This included a variety of stakeholders, such as current students, people who are currently undertaking a PDY or who have recently completed one, supervisors, mentors and other registered NMTs. The results were analysed in combination with a focused review of peer reviewed literature and the wider scholarly discourse on professionalisation and higher education.

The review aimed to explore a few key questions in particular. Firstly, should there be a PDY at all? The answer to this question is yes. However, like all educational activities there is always room for improvement and the review revealed a number of areas that could be addressed. Secondly, should the PDY experience continue to be an experience for new graduates or can it be embedded within an ANZSNM approved university program prior to graduation? In our opinion, the current weight of evidence, and thinking within higher education, supports the current practice of keeping the PDY as an experience for new graduates. Thirdly, how long should a PDY be? The current practice is for a PDY of 48 weeks. We believe this should continue, although this needs to be regularly reviewed in coming years. Finally, what supervision/support mechanisms should be provided for the PDY? The current mentoring system needs to be reviewed. Supervisors and mentors may benefit from further professional development programs to help them acquire the skills required in these roles. People undertaking a PDY may also benefit from the opportunity to share experiences with each other, whether face-to-face or online.

Definition of Terms:

“AIR” - Australian Institute of Radiographers

“ANZSNM” – Australian & New Zealand Society of Nuclear Medicine

“Nuclear Medicine Scientist” will be taken to be the equivalent of “Nuclear Medicine Technologist”

“Nuclear Medicine Scientist” will be taken to mean graduates of all programs accredited by the Board as well as those candidates who are successful in the Overseas Qualification Assessment (OQA) Exam.

“Nuclear Medicine Technology” will be taken to refer to the duties undertaken by a Nuclear Medicine Technologist/Scientist in the practice of their profession.

“PDY” (Professional Development Year) – currently a 12month period in which new university graduates are granted interim accreditation by the ANZSNM to work at an accredited Department or Practice prior to attaining full ANZSNM accreditation based on satisfactory performance

“PDY” – is also an interchangeable term with the Intern Program in Victoria

Introduction

The ANZSNM currently requires that all new graduates who wish to work as NMSs satisfactorily complete a recognised PDY. As part of its own efforts at continuous quality improvement, the ANZSNM decided to undertake a review of its members and key stakeholders to establish current opinions about the role of the PDY as it is now provided, and asking for insights for improvement. A questionnaire was designed on behalf of the ANZSNM and distributed in late March 2010. This report is a discussion of the issues raised by the questionnaire. Detailed quantitative analyses of the ANZSNM survey are included in the appendices. A formal review of the peer reviewed literature using key search terms was also conducted and also provides a context for the review. This formal literature review is included in the appendices. The discussion that follows also refers to the wider academic literature on higher education and professionalisation as well as results from the questionnaire. The discussion explores the following questions in particular:

- Is a PDY necessary?
- Should a PDY continue to be an experience for new graduates or can it be embedded within a university curriculum prior to graduation?
- What is the ideal length of a PDY?
- What support mechanisms should be provided for the PDY?

The Wider Context of Higher Education

The world of higher education is changing in a great number of ways. Barnett (2000) talks of the modern world as being a world of supercomplexity. Our graduates enter a world of work where they must contend with this supercomplexity. The universities themselves are in large part responsible for bringing about this world of supercomplexity because of the research and development work they undertake. This world of supercomplexity includes a great deal of uncertainty and change. An implication of this is that we may be able to provide an education that equips people to cope with the professional practice of today, but because our knowledge is growing and changing we can be sure that professional practice will be different in years to come and is likely to keep changing. We therefore need to provide

educational experiences for newcomers to the profession that will equip them for both today's practice and tomorrow's future practice, while still being uncertain what that future practice will look like (Higgs et al. 2010). Schön (1983, 1987) spoke of the 'swampy lowland' of professional practice, contrasting this with the apparently clearer world of scientific research. His point was that, although many professional practices, like the health professions, are based on scientific knowledge, the reality is that dealing with real world problems, and real people, frequently involves having to make decisions under uncertainty where it is not possible to have all the information that one would ideally like to have. Newcomers to a profession need to come to terms with this supercomplexity and its uncertainty and be comfortable working in the real world of professional practice while still remaining scientifically informed.

Of particular relevance to this report are the changes occurring in education for people entering the health professions. While medicine, dentistry, and pharmacy have had university education for many decades it is only within the last thirty years or so that other health professions, such as nuclear medicine, have made the move into the university sector. Within that time there has been a growing body of scholarly work that examines what it means to be a health professional, how newcomers are best educated and prepared for what is required of them, both now and in the future (e.g. Benner 1984, 1996; Higgs et al. 2008; Montgomery 2006). For example, Benner (1984) in nursing described in great detail the different levels of expertise through which a health professionals progresses from beginner to expert. While Benner's work focused on nurses it has been enthusiastically adopted in a range of health professions. It is clear from Benner's work that graduation is only the first step on the long road to clinical expertise. Several health professions have decided that new graduates should receive some sort of formal supervision and/or mentoring in the early stages of their careers in order to continue the professional development that can only begin in university. These insights are directly relevant to considerations of the PDY.

Clinicians with varying levels of experience have recognised the key benefits of clinical supervision post-graduation. These include the enhanced professional development and support for newcomers in carrying out their work tasks and roles (Sellars, 2004; Steenbergen & Mackenzie, 2004; Strong et al, 2003). Some health

professions have reported that as a result of supervisees' increased knowledge and skills from effective supervision, the quality of care for patients has improved and the risks involved in providing therapy are minimised (e.g. Sellars, 2004; Strong et al, 2003). Others have reported enhancement and preservation of profession-specific identities and skills (Hensley, 2002; Strong et al., 2003). Strong et al. (2003) found that this particular benefit of supervision was particularly important for recent graduates. Other bodies of work that are relevant to considerations of the PDY include work on communities of practice (Lave and Wenger 1991; Wenger 1998) and work that explores the debate between education and training. These will be discussed below. In the next section we explore the specific questions relating to the PDY in light of the literature and findings from the survey.

Is a Professional Development Year (PDY) necessary?

This is probably the most important question to address. The Australian Institute of Radiography (AIR) commissioned a review of their own PDY (2009) that described the year as a period of supervised development, aimed at building on the skills and knowledge acquired in the university program with a period of progression from simple to more demanding tasks and responsibilities. The primary reason for introducing the PDY with a "mediated entry" to the profession and being under supervision with limits on practice was mostly due to the move from diploma to degree. This meant there was a substantial reduction in the time devoted to the clinical placement component in the education provided to students (AIR 2009). The welcome increase in academic content had come at the expense of clinical experience and the PDY aimed to address this deficit. In addition, the AIR wanted to prevent entry level practitioners working in sole practitioner roles as they considered this unsuitable and by mediating entry it stopped this from occurring. The PDY for nuclear medicine scientists follows a similar rationale.

For nuclear medicine scientists within NSW, the length of clinical placements was substantially altered in the move from diploma to degree. The Cumberland College of Health Sciences nuclear medicine technology diploma in 1988 incorporated 39 weeks of clinical placement in their program whereas in 2010 the University of Sydney degree program had 22 weeks of clinical placement in real world settings

and two weeks on-campus (Handbook Cumberland College of Health Sciences 1988, Handbook The University of Sydney 2010). This change in nuclear medicine education brought a reduction of just over four months of clinical experience throughout the program.

Although the length of clinical placements during the students' education is an issue, the move in many allied health professions and nursing from diploma to degree is not uncommon nor is the reduction in clinical placement hours. The length of time spent on clinical placement and the length of the placement blocks in developing skills is raised in some literature comparing perceptions of new graduates in nursing from diploma versus degree programs. Wolf, Peust and Regan (2009) found that their participants (n=150) perceived diploma graduates to be more practice-ready than baccalaureate graduates because of the greater time spent on clinical placements. Participants believed that the shorter clinical blocks given to baccalaureate students did not allow them time to integrate theory to practice. On the other hand, Bartlett et al. (2000) in their comparison of diploma versus baccalaureate graduates found diploma graduates displayed greater ability to lead and make decisions on graduation but no significant differences in other areas. Interestingly, at one year the earlier difference in decision making and leadership did not remain. This finding alone lends direct support for a PDY.

Based on a thorough review of nuclear medicine associations worldwide, it would appear Australia is unique in having a PDY for medical radiation sciences graduates (AIR 2009). Full accreditation is achieved at the completion of an educational program or certified examination in the 10 countries investigated. The UK has a voluntary preceptorship program aimed at developing confidence and independence but this is not mandatory. The report also investigates some 70 allied health professions in Australia and notes that only a "small number" of these require supervised practice after graduation (p10). Audiology is the only other allied health profession in that report to limit full membership to the professional association until successful completion of the period of supervised practice. It is tempting to use all the other allied health professions as a benchmark, from which it could be argued that a PDY is not needed, as so many other allied health professions do not require a PDY.

However, this argument assumes that the majority of allied health professions already have the best preparation available for newcomers to their professions. But, it can also be argued that the Australian and New Zealand NMS community is leading the world in this regard. There is substantial anecdotal evidence that those personnel who have an Australasian degree, and who have completed a PDY, are highly sought after in other countries due to their perceived level of professionalism and competence. If there are to be comparisons with other health professions then the older, and more established professions, such as medicine could be taken as a benchmark instead. Medicine has had requirements for new graduates to undertake a pre-registration year for decades and this experience is now seen as being an essential part of the professional development of young doctors. The need for a pre-registration year in medicine is rarely questioned and its value as preparation for professional practice is generally taken as given.

There are also trends in places elsewhere in the world that can be considered. For example in the UK, dentists are expected to graduate practice-ready. Despite this, there have been so-called vocational training schemes in place for new dental graduates for nearly thirty years, and new graduates are required to participate if they ever wish to be fully independent practitioners. These schemes are similar in many ways to the PDY in providing support to new graduates making the transition from university to independent practice. Even though new dental graduates have always devoted much of their undergraduate time to the development of clinical skills, these vocational training schemes provide an opportunity to consolidate these skills and also provide support for coping with the kinds of problems that are more likely to occur in practice as opposed to those that occur only in a hospital setting. Pharmacy too in the Australasian region is heading towards a PDY type arrangement.

Our formal review of the medical, nursing and allied health literature (see Appendices) indicates that in general, recent healthcare graduates who have come through university study at degree or graduate entry Master's level are not fully ready for *independent* practice. The literature indicates the following as typical areas of deficiency:

- managing difficult situations
- prioritising workload
- specific fundamental skills need support to ensure safe and competent practice
- full development of 'professional' skills requires practice as an employee rather than a student. It is acknowledged that these skills are not fully developed as a student on limited clinical placements. Students must be closely supervised and their independence cannot match that of a graduate.

There is substantial agreement in the literature that a transition period of support for new graduates is required to produce a fully functioning and independent practitioner. For instance professional abilities such as learning to cooperate, communicate and the ability to make ethical decisions is best learned in the workplace and is difficult to develop in a simulated or theoretical setting.

Wolf et al. (2010) claimed that considerable variation exists as to what is perceived as readiness for practice and that debate about the readiness of nurses and allied health practitioners has been debated for at least the last decade. The authors suggest more emphasis should be placed on defining ‘practice readiness’, what standards are required for entry level practitioners and how they shall be evaluated. It is important to clarify these issues in order to have consistency when supporting new graduates in the workplace. In other words, supervisors or mentors of new graduates need to have a similar perception of what is expected and what is acceptable for a successful transition for the new graduates. The authors note that diversity of expectation can lead to unrealistic expectations and perpetuate a perceived lack of readiness.

Findings from the ANZSNM survey indicate the vast majority (over 90%) of nuclear medicine scientists (NMSs) (n=52 respondents in the ANZSNM survey) who 'had experienced a professional development year' (PDY) acknowledged that this period of support was of value. Respondents indicated that they needed additional time/experience to develop their skills as they did not feel equipped to take on a full

practice role. Many respondents identified 'hot lab' and 'injecting' skills as deficient at the time of graduation. The identified lack of skill was also recognised by almost a third of the respondents (9/27) who had 'not experienced a PDY'. These respondents noted that a PDY would have been helpful to them as they believed they had a lack of skills when they entered the workforce as new graduates.

For those who experienced a PDY (n=52) there was a "cap" on the activities they could undertake and the responsibilities they were given. This sheltered working environment allowed them time to safely develop their abilities. Essentially, the PDY provided them with time and support to make the transition from student to qualified practitioner in a safe environment (for them and for patients) before being given a fully independent role. Many respondents indicated that the short clinical placements during their university study were inadequate preparation for all that is required when entering the workforce and that being in the workplace full time created a very different learning environment. The continuity of practice and the far broader range of experiences were cited as the key to their development.

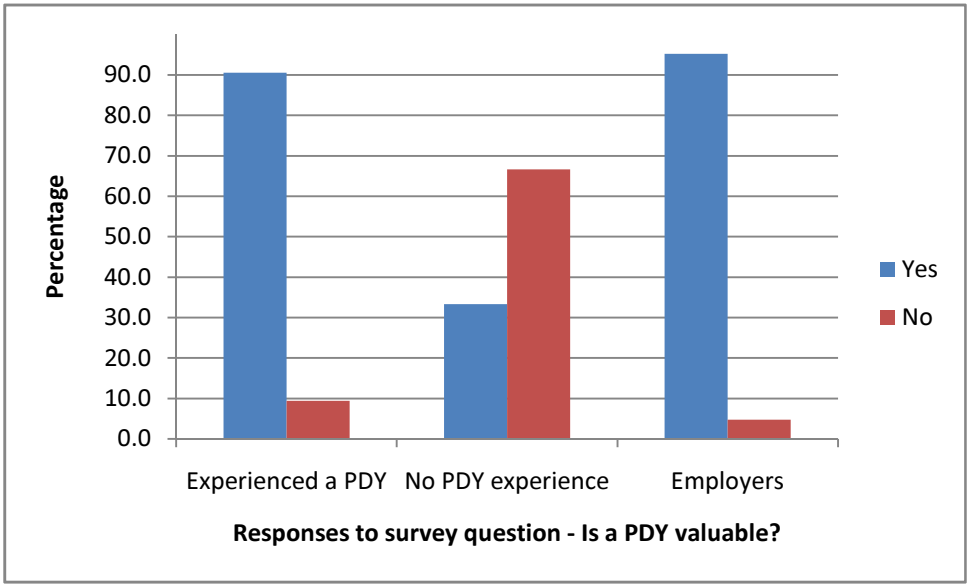

Figure 1. Three groups were asked to provide their opinion about whether a PDY was of value. The graph displays the percentage responses as a yes/no answer for the three groups. Those who had not experienced a PDY e.g. had completed a diploma with an embedded year of practice or close to a year were the only group to see the PDY as less valuable.
Respondent group sizes are: Experienced a PDY n = 53; Those who had not experienced a PDY n = 27; Employers n = 21

At this point it is useful to sum up the discussion so far. It would appear new healthcare graduates in general and those surveyed by the ANZSNM do not have all that is required to be *independent* practitioners. Emphasis is placed here on the capability to work *independently*. Even the most capable graduates can benefit from a period of sheltered practice where support from more experienced practitioners is available when needed. Comparison with other allied health professions may not be a useful means of deciding if a PDY is needed. The requirement for a PDY by the ANZSNM can be seen as leading the rest of the world in the professional education of NMSs. It may be better to compare NMS with other health professions such as medicine. Being a student is different from being a qualified worker and most new graduates need support in areas of deficiency and mentoring on their journey to expertise.

Should a PDY continue to be an experience for new graduates or can it be embedded within a university curriculum prior to graduation?

This question is not so easily answered either from the literature or from the data in the ANZSNM survey. The separate AIR discussion paper does not address this issue. However, on balance our opinion is that a separate PDY as a graduate has advantages over embedding a similar experience within the university curriculum. The main consideration has already been touched on earlier. Students need to be closely supervised and can rarely be given the same independence of practice permitted to a graduate. Even when a graduate is supervised, as in a PDY, the reins of graduate supervision can be, and should be, looser than those needed for students, providing a smoother transition to independent practice.

Some of the respondents to the ANZSNM survey indicated that they did not feel they would have benefited from a PDY program. Item 30 of the ANZSNM survey asked participants to say why this was so. The vast majority of these respondents (83%, n=15) had received an education where a substantial amount of clinical placement was embedded in their program of study, for example, full time work for a year as part of a diploma program and therefore these respondents did not feel additional clinical time under supervision would have served any worthwhile purpose.

Three respondents picked out different reasons for not considering the PDY to have been of value to them. Two of the three did not consider the PDY program was necessary for their transition to a qualified practitioner - “the learning process would still be the same. The PDY program only adds paperwork” and “having been a Mentor for the last 3 years I see little evidence that my interaction with PDYs has had any benefit at all”. However, this last remark may be more a reflection on the quality of mentoring provided rather than the quality of the PDY itself. In order to explore this issue in greater depth it would be necessary to research in more detail the supervision that students and graduates receive and how they differ. A study aimed at investigating influencing factors on students learning on placement, picked out the number of students per educator as a primary influencing factor. In the case of physiotherapy in the UK, a student to educator ratio of 2:1 on work placement was recommended as optimal for learning (Kell and Owen 2009).

A rigorous literature review aimed at exploring factors that influence nursing students’ clinical outcomes and current educational practices indicated that there was a lack of rigorous research in this area (Tanda and Denham 2009).The authors noted that measuring the number of hours of clinical experience does not necessarily equate to meeting the desired outcomes. Key findings from their review are:

- the optimal length of clinical placements should be 5 – 8 weeks in length. Placements where a greater complexity of practice is required should err towards the longer period. The mean clinical placement lengths for the first blocks were 7 weeks whereas final blocks were 9 weeks.

- there is a relationship between the placements and student outcomes. Student learning is influenced by the level of support and the types of experiences offered.

An Australian nursing program embedded a transition placement into the final year of their course in order to better prepare graduates for the workplace (Nash et al. 2009). The study involved a control group of students who had a traditional final year clinical experience compared to a group that had an enhanced clinical placement (more autonomy and responsibility) that specifically focused on aiding transition upon graduation. No significant differences in preparedness (confidence and skills)

were found between the groups but the students who participated in the enriched program were very satisfied with their experience.

Key issues arising in the literature regarding work placement learning and preparedness for practice at graduation are:

- hours are important to an extent but are not the sole measure of whether a graduate is ready to practice independently.
- the breadth (or range) of experience is very important to practice readiness.
- the environment that the student encounters on placement/practice has a substantial influence on their outcomes (learning and satisfaction).

Another issue brought out in the literature is the increasing difficulty in finding quality clinical placements where the learning environment is positive and provides a sufficient range of activities (Tanda and Denham 2009; Hartigan-Roger et al 2007). Given the importance of clinical placements to learning and practice readiness, it is important then to have clearly articulated capabilities of newly qualified graduates and confidence in the assessment processes of graduating institutions to ensure fitness for practice of its graduates.

Another body of literature that needs to be considered in this discussion is that of communities of practice. The concept of communities of practice can be dated to the original work of Lave and Wenger (1991) and further developed by Wenger (1998). Communities of practice are groups of people who share an interest for something that they do. A key insight is that people learn how to do their practice better as they interact regularly. In other words, a community of practice is essentially a group of individuals who have something in common they need to know how to do. This is the practice they share in common, even though most of the time they might engage in that practice as solo practitioners. The community of practice of NMS, for example, consists of a shared repertoire of resources: experiences, stories, tools, and ways of dealing with recurring problems. It is not simply an issue of acquiring a set of measurable behaviours called competencies. The community members also interact in order to share what they know so that all participants can benefit. This sharing and learning from each other makes them into a community. Besides the practice, there

is also a shared commitment to a domain of interest, characterised by a shared competence. These three features, practice, community and domain are taken to be the basic characteristics that mark out a community of practice (Loftus 2010).

The profession of nuclear medicine can be seen as a community of practice. As newcomers enter a community of practice there will be particular milestones such as graduation from university. However, the passage from newcomer to expert is seen as a gradual process. Even when practitioners work in solo practice there is a need for regular interaction with the wider community of practitioners. This regular interaction is most important in the early stages of a professional career. From this viewpoint, a sudden cessation of interaction upon graduation is counter-productive. The nature of the interactions with other members of the professional community can be expected to change rapidly as one progresses from student to graduate. However, such interactions with peers and other more expert members are seen as being crucial for one's development towards independent practice.

For these reasons a PDY as a separate experience for new graduates can be seen as an enlightened means of smoothing the transition from practice as a university student to practice as an independent professional. It is only when one more fully engages with the real world problems of practice in a more independent fashion than that allowed to students (the swampy lowlands described by Schön earlier) that newcomers can begin to appreciate what the professional practice is really all about. To take advantage of this, new practitioners need the opportunity to share their experiences with others, both peers and especially more experienced practitioners (Loftus 2010; Schön 1983, 1987). A well-run PDY can provide the ideal opportunity to socialise newcomers into the community of practice of NMS.

What length of time should a PDY be?

In the literature the length of time for support after graduation is variable and is acknowledged to be dependent upon the individual and their breadth and depth of experience. Typically, support programs range from 3 months up to 12 months but up to 24 months has been indicated as necessary for some individuals. When

thinking about how long it might take to be practice ready, it is necessary to be clear about what is meant by this and to have a dependable means of assessing it.

The AIR PDY discussion paper (2009) notes the rationale behind mandating one year (48 weeks full time equivalent) of supervised practice is “unclear” (p14). The authors point out that a substantial inequity arises in the actual contact hours undertaken by graduates because of the variability in working conditions, for example, a 35 hour versus 38 hour working week.

The majority (89%) of the ANZSNM survey respondents who had experienced a PDY considered 12 months appropriate. A very small number (n=6) considered less time was suitable, with respondents acknowledging that individual variation in experience and ability to be the main contributing factor to the length of time required. These comments reflected the findings from the literature. Almost all the employers/managers in the ANZSNM survey (20/21 respondents) thought the PDY was useful, and in general, 12 months was considered to be an appropriate length for the PDY with only a small proportion (19%) thinking six months to be appropriate with the possibility of a six month extension if required.

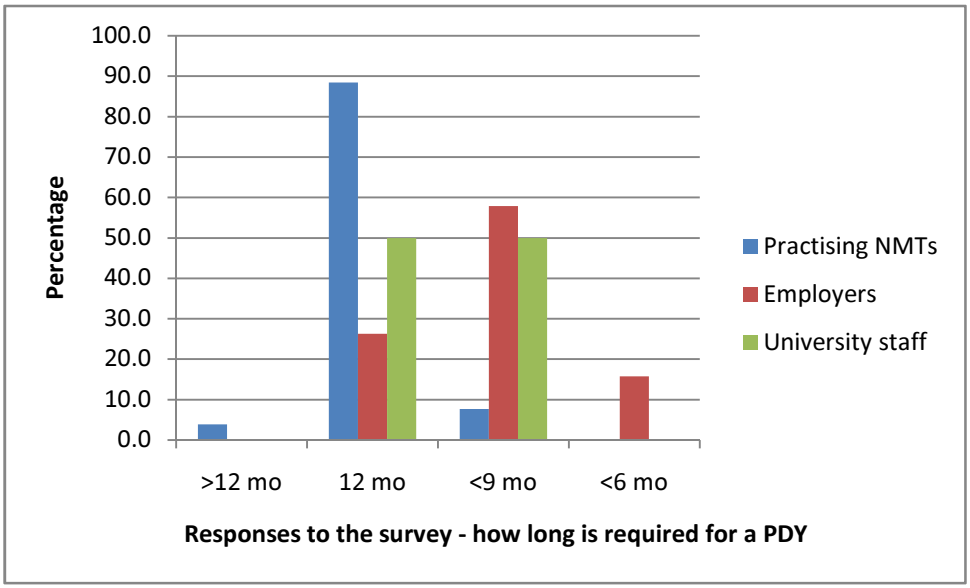

Figure 2. The chart above displays the survey item asking how long the PDY should be. Three groups responded. The chart presents the percentage response for each group.
Respondent group sizes are: practising as a NMT n = 52; employers n = 19; university staff n = 4

The AIR PDY discussion paper (2009) discusses the clinical experiences required in the PDY and the assessment of these (interim and final). The authors note the areas of clinical experience presently required by the AIR are not necessarily the most relevant for today's practice of radiography or radiation therapy, the descriptors are vague and highly subjective, the competency based standards document provides little to aid in the assessment and there is a focus on technical clinical experiences rather than other experiences that contribute to professional practice (p17). The assessment process relies on a loose judgement by the clinical supervisor because there is an absence of explicit detail and guidelines for assessment (p20). The key concerns of the assessment are that; competence is poorly defined, clinical experience expectations lack clarity and are inadequate, professional attribute expectations lack clarity and are inadequate, performance expectations are inadequately defined and the PDY cycle of assessment is too infrequent (pp20-23).

Romyn et al. (2009) found that the factors influencing practice readiness are complex and not helped by work environments where staffing levels are minimal and which therefore become an "erosion to comprehensive orientation programs". The authors claimed that there is sometimes an expectation on new graduates to perform at the level of experienced practitioners on entry to the workplace. This causes stress which in turn leads to high levels of attrition. It appears that these unrealistic expectations are sometimes due to chronic staff shortages. To expect fully independent practice in all areas of practice by the time of graduation is unrealistic. Participants in this study recognised a link between the students' educational experiences and their confidence when entering practice but that in general there were insufficient opportunities for hands-on experience during their course of study. Those who had gained additional experience e.g. paid work as a nurse assistant were seen to be more confident and capable when entering practice as a registered nurse. New graduates in this study identified a fear of being "in over their heads" and that this fear lasted for 6 months to a year.

There is substantial variability by what it means to be 'practice ready' and little specificity to the meaning i.e. clearly articulated criteria. Romyn et al. (2009) in their study spoke of "a new graduate capable of competent, unsupervised practice at the start of their career". This however does not mean the new graduate is capable of all

areas of practice or of practising at the rate of a more experienced practitioner. Again, the issue seems to come back to one of independent practice. It takes time to develop an individual who is comfortable with independent practice and can be trusted as an independent practitioner by colleagues. It is clear from all sources that there is considerable individual variability in the time required to achieve the confidence and competence for independent practice. The majority of participants in the ANZSNM survey and the research literature support a default period of 12 months. In our opinion the ANZSNM should continue with a 12 month PDY.

If a more flexible arrangement is ever considered where more capable graduates could be certified as ready for independent practice after 6 months, for example, then it would be necessary to have more rigorous assessment practices in place that would satisfy all concerned that the necessary standards have been achieved. Any university that claimed to be able to produce graduates who could routinely achieve independent practice within 6 months of graduation would need to demonstrate this with rigorous evidence.

What support mechanisms should be provided for the PDY?

The literature highlights the need for, and benefit of, a structured system of support for recently qualified healthcare graduates. In the case of medicine for example, a structured internship year is well established and the structure of this continues to evolve. The literature also identifies one of the key benefits of a structured support system as that of a buffer (mediating effect) to the stress encountered by newly qualified graduates entering the workplace. A structured support system is reported to:

- help increase the recent graduates' confidence
- compensate for poor working relationships
- improve retention by improving job satisfaction (mediating against stressors)
- help to develop a sense of professional self, particularly in areas of ability to observe and diagnose client needs and build confidence and assertiveness

Factors leading to a successful supervisory relationship are trust, communication, rapport, an atmosphere of support, advocacy and openness. In addition to these factors Nash et al. (2009) stated that belonging to a team was important to learning skills and knowledge.

Romyn et al. (2009) found that new graduates often felt a fear of asking questions. For example, one nurse stated that when she asked a question and had the response, "what do you mean you don't know?" she never asked that individual practitioner another question again, and was therefore presumably more at risk of making mistakes. When there were supportive and trusting relationships the transition into the workplace was "seamless". A strategy identified as positive was that of formal mentoring but the mentor needed to be able to work with the newly qualified graduate and not be at a distance.

In the ANZSNM survey 65% (n=34) of respondents who had undergone a PDY found the mentor did not help their transition in the first year (item 13 did having a mentor help). It appears that the workplace PDY program itself and workplace supervisors and colleagues are more important to newly qualified graduates in their first year. This concept of the workplace playing a pivotal role in development is supported in the literature. Hickey (2009) recognised the importance of a good orientation program because it aids development of clinical skills, clinical judgement and independent practice and retention. Recommendations made by Hickey to optimise orientation programs were to have a formal training session for the supervisor (preceptor) that included – identifying learner styles, adult learning principles, knowing how to observe and evaluate, knowing how to give feedback and provide a resource guide.

Findings from the ANZSNM survey indicate dissatisfaction with the current PDY support system particularly around the mentor/supervisor relationship. Two factors mentioned by respondents that led to a successful supportive relationship were that the mentor/supervisor should be approachable and readily available. Of concern is that almost two thirds of the respondents who had completed a PDY considered their mentor did not help in their PDY. In addition, there was fairly limited contact between

the newly qualified graduate and their mentor, with just over half (53%) the currently enrolled PDYs having contact only every quarter.

The literature and common sense indicate that a well prepared orientation program in the workplace is very important to safe and competent practice of newly qualified graduates. Hickey (2009) for example, states that most hospitals in the USA have some orientation program combined with a structured preceptor program for newly hired graduate nurses. From the literature and the results of the ANZSNM survey it would appear that a structured and rigorous system of support for workplace supervisors of new graduates may be of greater value than the external mentor system. Findings from the ANZSNM survey do indicate the workplace supervisor has a far greater impact on the new graduate's development than the mentor.

The issue of relationships between supervisors/mentors brings us back to the communities of practice idea. There needs to be regular and frequent interaction between new graduates and supervisors/mentors so that a healthy supervisory relationship can develop. In the medical education literature it is recommended that supervisors give some form of constructive feedback to new graduates on a daily basis where possible. This assumes a close working relationship where supervisors are able to judge what new graduates are doing at regular intervals throughout the day so that such feedback can be provided. The importance of this is reflected in the growing number of papers that outline how to maximise the educational benefits of the supervisory relationship in the workplace for new graduates such as the 'Teaching On The Run' series (e.g. Lake 2004, Lake 2005, Lake and Hamdorf 2004a, Lake and Hamdorf 2004b, Lake and Ryan 2004a, Lake & Ryan 2004b, Lake and Ryan 2004c, Lake and Ryan 2005a, Lake and Ryan 2005b, Lake and Ryan 2006a, Lake and Ryan 2006b, Lake and Vickery 2006, Lake et al. 2005, Molodysky 2007). This body of literature recognises that during a normal working day both new graduate and supervisor will have busy workloads and that, while patients have to be seen, teaching interactions must necessarily be brief. Such teaching interactions are often brief 'corridor chats' between seeing patients.

The issue of mentors is problematic. It is widely recognised that the mentor should ideally be someone other than the supervisor where possible, and that new

graduates should choose the mentor if they can. Contact between new graduates and mentors does not need to be on a daily basis but contact should be regular and in a relaxed environment where a relationship of trust can develop and participants get to know each other. If the relationship is to succeed then there is a need to establish early on what the expectations are about issues such as frequency of meetings (Johnson 2007).

Other ideas for support mechanisms in the PDY include an online environment where new graduates can share their experiences with each other and a tutor, as well as providing support to each other as they work their way through the postgraduate curriculum. They can form a virtual community of practice. Such online communities are being enthusiastically adopted by the organisations responsible for postgraduate medical education, such as the Royal Australian College of Physicians, The Australian and New Zealand College of Anaesthetists and the Royal Australasian College of Surgeons.

Discussion

There are a number of issues emerging from the literature and the survey results that are relevant to the PDY and how we can think about improving the transition from new graduate to independent practitioner.

For example, there is an ongoing debate about the place of competency based assessment and training in higher education. The competency based approach is currently popular and for understandable reasons. It provides an apparently transparent means of establishing measurable behaviours against explicit standards. However, there are many scholars who question this approach, arguing that it is reductionist and ignores the professional judgement that goes to make a profession what it is (e.g. Fish 1998; Fish & de Cossart 2007). These scholars argue that critical reflection and the ability to deal with uncertainty in an ethical manner are at the heart of professional practice. These ideas do not lend themselves to a competency based approach, and, that by ignoring these, the competency based approach threatens the very notion of professionalism itself. The same scholars go on to argue that a competency based approach may be appropriate to a technical/vocational

occupation but does not begin to engage with these issues which are at the heart of professionalism.

In their move to the university, health professions have sought to distance themselves from what they saw as the weaknesses of the vocational/apprenticeship approach. These weaknesses are precisely the lack of critical reflection and professional judgement mentioned above. Nurses, for example, have tried to distance themselves from being seen as merely handmaidens to doctors. Now, because of their university education, they see themselves as being more able to exercise critical and reflective judgement and assume greater responsibility for making clinical decisions. This also means that they can feel more confident in being advocates for patients, even when this means standing up to the medical profession and contesting decisions.

If Nuclear Medicine wishes to see itself as a profession rather than a technical trade then the Nuclear Medicine community will also need to engage with the same issues in their own context. How much responsibility and decision making does the profession see as being appropriate for their practitioners? While NMSs will always be working in close partnership with other health professions, such as medicine, there is an ongoing need to engage with questions of boundaries for responsibility and decision making power. These are issues confronting all health professionals, not just nurses and NMSs. The answers to these questions will profoundly affect the university curriculum as well as what is expected in the PDY.

Many health professions recognise the need for new graduates to enter a transition phase after graduation. Medicine, for example, has recognised this need for decades, and it is now accepted that new medical graduates are not ‘practice ready’, and do need a period in which they accept more and more responsibility while being supervised and mentored. This is despite the fact that medical students spend substantial amounts of time gaining clinical experience in the university programs. It is clear, from the survey and the literature, that the experience of students in the health professions doing clinical practice as part of their university education is not comparable to that of new graduates entering the workplace. Students do not accept nearly the same levels of responsibility expected of new graduates, no matter how

much time they spend gaining clinical experience. Therefore, it can be argued that a transition period is needed.

An opposing position can argue that there are health professions which do claim to produce ‘practice ready’ graduates, such as dentistry, among others. It can be argued that such professions tend to be those, like dentistry, which see themselves as requiring a high degree of technical skill and which provide students with this in the form of extensive clinical practice before graduation. However, dentistry has long been engaged with the issue of whether or not to provide a transition period after graduation and as indicated earlier there appears to be a clear trend towards a PDY equivalent in dentistry. Most dentists see this as a good thing. Proponents present a range of arguments, such as the length of the university course being insufficient to expose students to all they need to know for independent practice to those arguments presented earlier that some form of transition period is needed (e.g. Atchison and Cheffetz 2002). According to the AIR report (2009) the health professions, in general, are divided as to the need for a PDY. However, it is clear that the majority of NMSs currently see the PDY as beneficial and some see it as essential.

If the Nuclear Medicine community decides that a PDY should continue to be required then it can also be argued that the community has an ethical obligation to provide sufficient places for all those new graduates who want one each year. It seems that at the present time there are insufficient places available and that some new graduates are therefore being prevented from entering the workforce for some considerable time. This is a serious issue that the ANZSNM will need to address with some urgency if the PDY is to continue.

The issue of the quality of mentoring and supervision is emerging in many professions. There is a growing recognition that supervision and mentoring of both students and new graduates are skills that need to be developed. Simply being good at one’s profession and providing a role model is not enough. Supervisors/mentors need to know something about the pedagogy of higher education and need support in dealing with problems such as the new graduate who needs remedial help, for example. Supervisors/mentors need well-developed teaching skills including an

ability to know when to apply straightforward technical training or more sophisticated educational measures to foster critical and ethical reflection that are aimed at professionalism. There is a growing literature on these issues within the other health professions and the Nuclear Medicine community will need to engage with these issues (e.g. Fish and de Cossart 2007).

Within higher education it is now realised that our thinking about curriculum needs to develop. This realisation is relevant for professional organisations, such as the ANZSNM which provide curriculum for a PDY. For too long, curriculum has been associated with syllabus which is simply the content knowledge of the course. We now realise that curriculum is the complete educational experience. Barnett and Coate (2005) speak of thinking about curriculum as being on three axes: knowing, doing and being. The first two are relatively straightforward. Knowing relates to the content knowledge or syllabus. Doing relates to practical skills. However, *being* relates to things such as being ethical, being professional, being critical and being reflective. These are not skills as such. As Schön (1983, 1987) observed being a professional is a way of being in the world. A number of scholars have observed that to be a proficient and independent practitioner one must engage in practice for some time with the aid of those more experienced who can guide you (e.g. Vygotsky 1978; Fish and Coles 2005). Therefore, a well-organised and well-run PDY is a far-sighted means of assisting new graduates to become independent practitioners who are professional in the best sense of the word.

Conclusion

Newly qualified graduates are not ready to practice without some support to further develop their professionalism and be socialised into the workplace. Good orientation programs and a supportive workplace supervisor and colleagues are needed for the development of the newly qualified graduate to become an independent practitioner. There is clearly a trend to include more workplace learning in university programs and a trend to ensure that such experiences provide maximum learning opportunities for students. These trends are to be welcomed and go a long way to producing graduates who are ready for the real world of work. However, in our opinion there is still a need for a sheltered transition period for a new graduate to become an

independent practitioner. The emphasis is on the independence of the new practitioner. A student cannot fully experience such independence. If a university program was to claim that its graduates were practice ready without further need for a transition period, or that its graduates needed a shortened version, then it is incumbent upon the proponents of such courses to provide sufficient evidence that this is the case.

Recommendations

- The PDY program be retained
- The PDY program be retained as a postgraduate experience
- The PDY program should continue to be one year
- The provisions for supporting new graduates through supervisors and mentors need to be revisited. Options such as providing an online community where participants can share stories of practice and support each other with the aid of a tutor could be considered.

References:

Adams, E., Schofield, D., Cox, J., & Adamson, B. (2008). Will the Australian nuclear medicine technologist workforce meet anticipated health care demands? *Australian Health Review*, 32(2), 282-291.

Adams, E. J., Cox, J. M., Adamson, B. J., & Schofield, D. J. (2008). A profile of Australian nuclear medicine technologist practice. *Nuclear Medicine Communications*, 29(1), 83-90.

Adams, E. J., Cox, J. M., Adamson, B. J., & Schofield, D. J. (2009). Truncated careers in nuclear medicine technology: increased job control may improve retention. *Australian Health Review*. (accepted for publication 19 October 2010).

Atchison, K. A., & Cheffetz, S. E. (2002). Critical Issues for dentistry: PGD Program Directors Respond. *Journal of Dental Education*, 66(6), 730-738.

Atyeo, J., Adamson, B., & Cant, R. (2001). Managerial skills for new practitioners in Medical Radiation Sciences in Australia: Implications for the tertiary education sector *Radiography*, 7, 235-247.

Australian Institute of Radiography (2009). *Review of the Professional Development Year: a Discussion Paper*. Melbourne.

Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: state of the art. *Journal of Managerial Psychology*, 22(3), 309-328.

Barnett, R. (2000). *Realizing the University: in an age of supercomplexity*. Open University Press: Buckingham

Barnett, R. & Coate, K. (2005). *Engaging the Curriculum in Higher Education*. Buckingham: Open University Press.

Barrett, C., & Myrick, F. (1998). Job satisfaction in preceptorship and its effect on the clinical performance of the preceptee *Journal of Advanced Nursing*, 27, 364-371

Bartlett, H. P. (2000). A comparison of the nursing competence of graduates and diplomats from UK nursing programmes. *Journal of Clinical Nursing* 9, 369-381

Beecroft, P. C., Santner, S., Lacy, M. L., Kunzman, L., & Dorey, F. (2006). New graduate nurses' perceptions of mentoring: Six-year programme evaluation. *Journal of Advanced Nursing*, 55, 736-747

Benner, P. (1984). *From novice to expert: Excellence and power in clinical nursing*. Reading, MA: Addison-Wesley.

Benner, P. A., Tanner, C. A., & Chesla, C. A. (Eds.). (1996). *Expertise in nursing practice: Caring, clinical judgment, and ethics.* New York: Springer Publishing.

Birks, J., Farrell, E., & Newson, A. (2004). Flexible teaching and learning in general practice. *Australian Family Physician*, 33(9), 687-689.

Bjorkström, M. E., Athlin, E. E., & Johansson, I. S. (2008). Nurses' development of professional self-from being a nursing student in a baccalaureate programme to an experienced nurse. *Journal of Clinical Nursing* 17, 1380-1391

Chipchase, L. S., Williams, M. T., & Robertson, V. J. (2008). Preparedness of new graduate Australian physiotherapists in the use of electrophysical agents *Physiotherapy*, 94, 274-280

Doherty, G., Stagnitti, K., & Schoo, A. M. M. (2009). From student to therapist: Follow up of a first cohort of bachelor of occupational therapy students *Australian Occupational Therapy Journal* 56, 341-349

Fish, D. (1998). Appreciating *Practice in the Caring Professions: Re-focusing Professional Research and Development* Butterworth-Heinemann.

Fish, D. & Coles, C. (2005). *Medical Education: Developing a curriculum for practice*. Maidenhead: Open University Press.

Fish, D., & de Cossart, L. (2007). *Developing the wise doctor: a resource for trainers and trainees in MMC*. London: Royal Society of Medicine Press.

Gome, J. J., Paltridge, D., & Inder, W. J. (2008). Review of intern preparedness and education experiences in General Medicine *Internal Medicine Journal*, 38, 249-253

Hartigan-Roger JA, Cobbett SL, Amirault MA, Murise-Davies ME 2007 Nursing Graduates' perceptions of their undergraduate clinical placement. *International Journal of Nursing Education Scholarship* 4:1-12r

Hensley, P. H., (2002). The value of supervision. *The Clinical Supervisor*, 21, 1, 97-109.

Hickey MT 2009 Preceptor perceptions of new graduate nurse readiness for practice. *Journal for nurses in staff development* 25:35-41.

Higgs, J, Fish, D, Goulter, I, Loftus, S, Reid, J-A, & Trede, F. (Eds.) (2010). *Education For Future Practice.* Sense: Rotterdam.

Higgs, J., Jones, M., Loftus, S., & Christensen, N., (Eds). (2008). *Clinical reasoning in the health professions* (3rd ed.). Edinburgh: Elsevier.

Holland, K., Roxburgh, M., Johnson, M., Topping, K., Watson, R., Lauder, W., et al. (2010). Fitness for practice in nursing and midwifery education in Scotland. *Journal of Clinical Nursing* 19, 461-469

Johnson WB (2007) *On Being a Mentor: a guide for higher education faculty*. New York: Psychology Press.

Kell C and Owen G 2009. Approaches to learning on placement: the students' perspective *Physiotherapy research International* 14:105-115

Lake, F. (2004). Teaching on the run tips: doctors as teachers. *Medical Journal of Australia, 180*, 415-416.

Lake, F. (2005). Teaching on the run tips 9: in-training assessment. *Medical Journal of Australia, 183*(1), 33-34.

Lake, F., & Hamdorf, J. M. (2004a). Teaching on the run tips 5: teaching a skill. *Medical Journal of Australia, 181*(6), 327-328.

Lake, F., & Hamdorf, J. M. (2004b). Teaching on the run tips 6: determining competence. *Medical Journal of Australia, 181*(9), 502-503.

Lake, F., & Ryan, G. (2004a). Teaching on the run 3: planning a teaching episode. *Medical Journal of Australia, 180*, 643-644.

Lake, F., & Ryan, G. (2004b). Teaching on the run tips 2: educational guides for teachers in a clinical setting. *Medical Journal of Australia, 180*, 527-528.

Lake, F., & Ryan, G. (2004c). Teaching on the run tips 4: teaching with patients. *Medical Journal of Australia, 181*(3), 158-159.

Lake, F., & Ryan, G. (2005a). Teaching on the run tips 8: assessment and appraisal. *Medical Journal of Australia, 182*(11), 580-581.

Lake, F., & Ryan, G. (2005b). Teaching on the run tips 11: the junior doctor in difficulty. *Medical Journal of Australia, 183*(9), 475-476.

Lake, F., & Ryan, G. (2006a). Teaching on the run tips 12: planning for learning during clinical attachments. *Medical Journal of Australia, 184*(5), 238-239.

Lake, F., & Ryan, G. (2006b). Teaching on the run tips 13: being a good supervisor - preventing problems. *Medical Journal of Australia, 184*(8), 414-415.

Lake, F., & Vickery, A. W. (2006). Teaching on the run tips 14: teaching in ambulatory care. *Medical Journal of Australia, 185*(3), 166-167.

Lake, F., Vickery, A. W., & Ryan, G. (2005). Teaching on the run 7: effective use of questions. *Medical Journal of Australia, 182*(3), 126-127.

Lave, J., & Wenger, E. (1991). *Situated learning: legitimate peripheral participation.* Cambridge: Cambridge University Press.

Loftus, S. (2010). Exploring Communities of Practice: Landscapes, Boundaries and Identities. In J. Higgs, D. Fish, I. Goulter, S. Loftus, J-A Reid, & F. Trede (Eds.) *Education For Future Practice.* (pp. 41-50). Rotterdam: Sense.

Matheson, C., & Matheson, D. (2009). How well prepared are medical students for their first year as doctors? The views of consultants and Specialist registrars in two teaching hospitals *Postgraduate Medical Journal* 85, 582-589

Molodysky, E. (2007). Clinical teacher training - maximising the 'ad hoc' teaching encounter. *Australian Family Physician, 36*(12), 1044-1046.

Montgomery, K. (2006). How Doctors Think: clinical judgment and the practice of medicine. Oxford: Oxford University Press.

Nash R, Lemcke P and Sacre S. 2009. Enhancing transition: an enhanced model of clinical placement for final year students *Nurse Education Today* 29:48 – 56.

Romyn DM, Linton N, Giblin C, Hendrickson B, Houger Limacher L, Murray C, Nordstrom P, Thauberger G, Vosburgh D, Vye-Rogers L, Weidner A and Zimmel CM. Successful transition of the new graduate nurse. 2009. *International Journal of Nursing Education* Scholarship 6:1-28.

Roxburgh, M., Lauder, W., Topping, K., Holland, K., Johnson, M., & Watson, R. (2010). Early findings from an evaluation of a post-registration staff development programme: The Flying Start NHS initiative in Scotland. *Nurse Education in Practice* 10, 76-81

Santucci, J. (2004). Facilitating the transition into nursing practice: concepts and strategies for mentoring new graduates. *Journal for Nurses in Staff Development* 20, 274-284

Schön, D. A. (1983). The reflective practitioner: How professionals think in action. New York: Basic Books.

Schön, D. A. (1987). Educating the reflective practitioner. San Francisco: Jossey-Bass.

Sellars, J. (2004). Learning from contemporary practice: An exploration of clinical supervision in physiotherapy. *Learning in Health and Social Care*, 3, 2, 64-82.

Smeby, J. C., & Vagan, A. (2008). Recontextualising professional knowledge - newly qualified nurses and physicians. *Journal of Education and Work*, 21, 159-173.

Steele, C., & Yielder, J. (2004). Clinical supervision: Designing a model to enhance clinical learning for medical imaging students *Journal of Diagnostic Radiography and Imaging*, 5, 89-97

Strong, J., Kavanagh, D., Wilson, J., Spence, S. H., Worrall, L., & Crow, N. (2003). Supervision practice for allied health professionals within a large mental health service: Exploring the phenomenon. *The Clinical Supervisor*, 22, 1, 191-210.

Tanda R and Denham SA. 2009. Clinical instruction and student outcomes *Teaching and Learning in Nursing*. 4:139-147.

Vygotsky, L. (1978). *Mind in society: The development of the higher psychological processes.* Cambridge, MA: MIT Press.

Wenger, E. (1998). *Communities of Practice: Learning Meaning and Identity*. Cambridge: Cambridge University Press.

Wolff, A. C., Pesut, B., & Regan, S. (2010). New graduate nurse practice readiness: Perspectives on the context shaping our understanding and expectations *Nurse Education Today* 30, 187-191

Wolf AC, Regan S, Pesut B and Black J. 2010. Ready for what? An exploration of the meaning of new graduate nurses' readiness for pratice? *International Journal of Nursing Education Scholarship* 7:1-14

Appendix 1: Summary of ANZSNM Survey

Report of Percentages

The findings reported in this summary have been clustered under their specific groups e.g. NMSs. When reporting the proportion of respondents to a particular theme or item, the denominator is the number of respondents in the specific group and not the total number of respondents to the survey i.e. 182. Using this method reports a valid percentage for each group or item.

Representativeness of Findings

It is important when considering the findings from the survey to look at the actual group size of the respondents e.g. current UG students and not compare this against the total number of respondents in this survey i.e. n=182. The response rate for the specific group (number of respondents in a group/total number in Australia and New Zealand in that group) needs to be determined so that an assessment of the representativeness of the findings can be made e.g. total number of UG students that responded to the survey against the total number in Australia. The response rate for each group helps to determine whether the themes that have emerged from this group are representative of the population. If the response rate is low there may be bias in the results. Normally a response rate less than 25% in a homogenous group is deemed low. Given this was a population survey i.e. sent out to all possible respondents and not a sample i.e. only a portion of the population, a lower response rate is more acceptable. Group Sizes:

- Students UG n=69
- Students PG n=5
- Accredited NMSs n=79 (but only 52 of these were actually practicing NMSs)
- Employers/ manager n=24
- Mentors n=17
- Uni staff n=5
- SIG n=10

Key Findings from the Student Group (UG and PG) and PDY

A total of 74 (UG and PG) students and 15 PDYs responded to the survey, as a combined group this was the largest group of respondents (n=89). Although the total number of respondents was 89 one was missing thereby making the valid number

88. Percentages expressed in the key findings have been calculated from the total number in this group.

Professional Development Year

The vast majority of students or PDYs heard about the professional development year (88%) and accreditation (77%) before the end of their first year at University. The most common reason (49%) selected for entering the profession was that it provided a combination of science and medicine. Interestingly, just of half ranked nuclear medicine as their first choice and 75% would have considered completing a dual degree. Of those who would have completed a dual degree (n=47), 70% would complete a two year PDY to have dual accreditation.

Of the 15 PDYs the majority found it difficult to find a position. It is unclear why four respondents stated that this item was not applicable. Perhaps they are not employed but they have responded to other items in this section which confuses the findings. For instance, item 16 asks if their employer has a PDY syllabus and four have responded that they have not. If these four aren't employed then the response to item 16 makes sense and the fact that it appears some centres don't have a syllabus should be ignored. This applies to item 17 as well. In addition the smaller number of actual PDYs adversely influences the response rate because the numbers are even smaller thereby making its generalisability poor.

The responses to what possible changes are needed in the syllabus were diverse although two themes emerged. One was that everything was OK while the other stated that more support was required. It is difficult to know whether there are two discrete groups within this group i.e. one with more experience and one with less. If two groups exist it may mean that over time issues arise where more support is needed or vice a versa.

Item 29 asked what changes could be made to the PDY program. 18 respondents said change was needed whereas 70 said no change and 94 giving no response. It appears this item was open to all students and PDYs i.e. 88 valid responses. Given there are 15 PDYs in the survey and 18 said yes to change it is unclear how informed the 18 are about this topic. If a respondent has not yet experienced the

PDY program are they suitable to give a response? Bearing this in mind, the responses from the 18 indicate an overwhelming dissatisfaction with insufficient places for PDYs, with some suggesting a shortening of time to increase the possibility of attaining accreditation.

Key Findings from the Nuclear Medicine Scientist Group

A substantial range of experience levels is present in the nuclear medicine scientist (NMS) group which is indicated by the large standard deviation (SD) of 9.23 years. A median of 9 years experience was reported. Although there are 79 respondents in this section only 72 are presently working as a NMS.

NMSs who experienced a PDY

Only 67% (n=52) of this group had actually experienced a PDY. A little under half (48%) of these respondents i.e. 52 are still employed where they completed their PDY. Given the range of years of experience it would not be unusual for staff to move onto other positions. In general, individuals moved to another position to either advance their career or because of a more suitable location. Only 21% of these knew their mentor prior to commencing the PDY. The vast majority (over 90%) found their PDY valuable and equipped them better than at the point of graduation. Note that item 20 (did the PDY equip them better than at graduation) is a little flawed because it would be almost impossible not to be better after having a full 12 months of additional clinical experience. Given this, it is very interesting that four respondents stated that it did not equip them better.

Forty five respondents provided reasons as to why the year equipped them better. The vast majority of reasons given as to why the PDY equipped them better were related to needing additional time/experience to develop their skills. A sub-set of this theme was that the PDY provided a supportive environment where the expectations were not that of a fully accredited practitioner. In other words, the majority did not feel completely ready to take on a full role.

Three respondents identified that the PDY made them less equipped. Two felt they were ready enough at the point of graduation whereas the other was very disillusioned with the supervisor and mentor.

Supervisors for the group who experienced a PDY were experienced, with a median of 12 years and SD 6.4 years. Most respondents (79% and 75% respectively) perceived their supervisors level of expertise and supervisory skills as a 4 or 5 (excellent) rating. It would appear 29 of the 52 were not satisfied with their supervisor and yet only 8 spoke about it with their supervisor.

Of the 52, 88% felt 12 months was an appropriate length of time for the PDY. Four felt six months or less was needed and two felt 15 months was more appropriate. The reasons provided were variable (no common theme emerged) but it does seem the workplace itself plays the primary role in the development which may not actually be as a result of the PDY.

Even though there was a fair consensus regarding the length of time for a PDY this was not the case with regard to needing change to the PDY program where 31% thought change was needed. Of these many were dissatisfied. The most common theme emerging for the reasons for change were that the supervisors/ mentors were not the most appropriate people for the job. The responses indicate that role modelling is very important.

NMSs who did not experience a PDY

Twenty seven of the 79 NMTs did not have a PDY experience. Nine (33%) indicated that they thought it would have been of benefit. The main theme for why they felt it would have been of value was that they perceived some skills lack on graduation. A minor theme was that mentoring would have assisted their career development. Although the number of respondents is small (n=9), it is interesting that any in this group would have expressed a need for more development when their education would have included far more clinical experience e.g. 30 weeks instead of 21 weeks.

Eighteen respondents felt that a PDY was not necessary for them primarily because they had gone through their education as either an apprenticeship style or where large blocks of clinical experience were embedded in the program.

Key Findings from the Manager Group

Only 19 of the 24 managers responded to a number of the items in this section. Many of the early items are self-explanatory in this section as there are almost unanimous responses. Fourteen of 19 felt that most PDYs were competent before 12 months (item 11) but only 3 of 24 thought six months was sufficient for a PDY with the possibility for an extension (item 9). Just over half (58%) thought a multi-centre approach would be of value. Interestingly 33% stated they would employ a new graduate not accredited (item 14). There was strong support (83%) for taking a new graduate if the PDY was financially supported. Almost half (49%) found the PDY program a resource implication to their department.

Managers choose their supervisors primarily (42% in each case) because of their role or as a result of the individual's enthusiasm for education. Only one respondent identified years of experience as a reason and yet the student and PDYs perception is that years of experience was the primary factor for holding the position and in some cases were dissatisfied.

Half the respondents felt there was a better way to do the final assessment, with assessment by multiple staff being the most acceptable (75%). Twelve respondents identified changes that could be made to the PDY program. A very diverse range of responses was obtained but a small number identified that mandatory inclusion of PET/CT was necessary.

Key Findings from the University Group

This is a smaller small group with only 5 respondents.

The median number of undergraduate (UG) students per year is 31 with a large SD 10.5 noted. A high dropout rate is experienced for these students with a median 37%. Postgraduate year size is much smaller with an average of 7.3 and SD 3.8 and a smaller dropout at average 3.3% SD4.7.

Almost all (n=4) respondents notify their students before the end of first year about the PDY. Accreditation is also discussed early in their course through a lecture from an ANZSNM accreditation board member to the students.

The majority (n=4) feel the PDY increases professionalism but when examining the responses it seems the PDY is seen to be more important for nuclear medicine science as a whole rather than a benefit to the individual i.e. having a PDY shows others that nuclear medicine is a profession.

Four respondents feel PDYs need additional time after graduation to become competent for solo practice, with two of these considering that this could be achieved within 6 months post graduation.

All five suggested changes to the PDY program with no particular theme emerging. The fact that all five answered this item may indicate a strong perception that change is needed.

Special Interest Group

There were 10 respondents from a range of professions. Four respondents thought a PDY was of value to their profession but this does not indicate whether they perceive it is of value to NMSs.

Key Findings from the Mentor Group

The mentor respondents were a fairly experienced group with an average of 5.9 years as a mentor. The largest group within the mentors are Chiefs who make up almost 50% of the respondents. On average 7.5 contact points (SD3.4) are made through the year which equates to a little over every second month. This is confirmed in item 15 with 7 respondents saying they contact monthly whilst 6 respondents have contact every 3 months. Phone (58%) and email (38%) are the most common form of communication. The PDY is the greatest influence on when contact is made. This lack of initiating contact is interesting given that 14/16 did not consider their employment situation affected their ability to do the role.

Training and an articulation of the goals for the PDY program were considered to requirements to assist them in their role (n=11 responded). The majority of respondents take on the role as a mentor because they want to give back to the profession and continue in the role because of a desire to nurture those new to practice.

Just over one third (37%) considered that by the mentee knowing the mentor it would improve effectiveness. The same proportion had actually undergone some form of mentor training with almost all these finding the training of value.

A range of shortcomings to the program were identified but a lack of face to face meetings and a lack of efficacy to the role emerged most strongly. Ways to overcome problems were to have face to face contact and an important note to ensure that confidentiality was maintained at all times.

Length of time for the PDY

It is generally accepted that 12 months is a suitable length of time required for the PDY although there is some support for reduction. Breaking the findings down into valid group responses indicates that fourteen (73%) of 19 managers felt less than 10 months was acceptable. A small number, two of the four University staff and four of 52 NMSs thought less than 9 months acceptable. In total, 55 of 75 (74%) thought 12 months or longer was acceptable

Appendix 2: Analysis of specific Items Related to Value and Structure of PDY

Specific items that address the value of a PDY have been further analysed. Note the item numbers are listed as per the survey. Quantitative data is given as valid percent response rates. The open ended responses have been reviewed in greater detail to inform the quantitative results. An overall summary is provided - this is directed towards the queries of the committee not an overarching summary of the data.

Items related to those currently enrolled in a PDY (items 15 - 29)

Respondents (n=15) the valid percentage responses are calculated using 15 as the denominator. The survey instrument does not do this; it uses the total number of respondents.

Do you have enough support?

- 14 stated they had sufficient support (valid 93%)

How often was contact with their mentor?

- weekly (week) 0
- monthly (month) 7 (valid 47%)
- quarterly (qar) 8 (valid 53%)

Does employer have a formal PDY syllabus?

- Yes 11 (73% valid)
- No 4 (27% valid)

Do you feel it was appropriate?

- Yes 11 (73% valid)
- No 4 27% (valid)

What would you want more or less of in PDY syllabus (open ended response)?

Three themes -

- it is OK (n=2)
- no opinion (n=3)
- need more help in the transition (n=7)

This is about the workplace PDY syllabus and therefore the workplace is the key and not the formal PDY program provided by ANZSNM. In other words if the workplace is

good at supporting graduates in their first year then they feel well supported. The majority of respondents felt they needed more support though.

Does their syllabus include PET?

- Yes 9 valid 60%
- No 6 valid 40%

Sufficient PET exposure?

- Yes 10 66% valid
- No 5 34% valid

Weeks of PET recommended?

- the average was 3.4weeks but a big std dev 2.3

Syllabus includes paediatric?

- Yes 12
- No 3

Sufficient paediatric?

- Yes 11
- No 4

Recommend weeks of paediatric?

- average 2.4, std dev 1.08

Does it include therapy?

- Yes 13
- No 2

Does it include cell labelling?

- Yes 13
- No 2

Changes suggested to PDY

This item must have been open to more than those currently enrolled in a PDY. The vast majority of respondents did not feel change was needed (I'm not sure who the other respondents were which may make a difference to the impression this response rate leaves)

Was a change required?

- Yes 18
- No 71

What changes are suggested to PDY (open ended)?

- Have more PDY positions n= 11
- Shorten PDY (many responses are related to the lack of availability) n= 5

Key Points from those enrolled in a PDY

- Most of the respondents feel they have sufficient support but contact with mentor is infrequent (most commonly 53% quarterly)
- Most (11/15) have a formal PDY syllabus in their workplace and are satisfied with the scope and content

Mentor and Supervision Items (note these are different roles - the mentor is off site and the supervisor is part of the workplace on site). Items 44 – 58 (53 respondents)
Did having a mentor help?

- Yes 18
- No 35 (66% valid)

How many years qualified was supervisor (53 respondents)?

- average 12.75yrs, Std Dev 6.4

How would you rate their technical skills? (1 = poor 5 = excellent)

- 1 (1) n=1
- 2 (2) n=1
- 3 (3) n=9
- 4 (4) n=20
- 5 (5) n=22

How would you rate their supervisory skills? 1 = poor 5 = excellent

- 1 (1) n=4
- 2 (2) n=2
- 3 (3)n= 7
- 4 (4)n= 24
- 5 (5) n=16

Were they a good professional role model?

- yes =47
- no = 6

If you weren't satisfied did you advise your mentor?

- yes = 8
- no = 21

Did you find PDY year valuable?

- yes=48
- no=5

Did it equip you to practice NM when graduated?

- yes=49
- no=4

Why did it equip you? (52 respondents)

The vast majority of responses support the notion of a PDY as it provides the experience they still need to practice in a supportive and reduced role i.e. not fully responsible until the workplace feels they are. Many respondents identified that they were deficient in skills e.g. hot lab, injecting when they left Uni and that the first year was essential in developing these in order to be ready for full practice. Another theme was that working as a student is not the same as working as a PDY. There is far more responsibility as a PDY but there is a cap on it because you aren't yet fully qualified which is a good thing.

I think that many respondents have answered that support in their PDY came from the centre where they worked and not from their mentor or the actual PDY program. This needs to be considered but at the same time there is very strong support for this interim period before full accreditation.

Why it made you less equipped?

One very dissatisfied respondent with regard to the value of the PDY. I am unsure by the comments whether the PDY mentor was the individual they were most dissatisfied with or whether it was actually the senior staff member they worked with in the workplace.

Is 12 months an appropriate time for the PDY program?

- Yes =47 89% valid
- No=6 11% valid

How many months would you suggest?

- Three Months (3) n=1

- 6 Months (6) n=3
- 9 Months (9) n=0
- 15 months or more (more) n=2

Why this many months? (6 respondents)

- One thought PDY "crap"
- Three thought 6 - 12 months sufficient to learn everything; it depended upon the experiences the PDY actually got in their centre.

Would you like changes to PDY?

- Yes = 17 (32% valid)
- No=36 (68% valid)

What changes to PDY? (16 respondents)

- many of them reporting dissatisfaction with the current PDY.

Key points from feedback about mentors/supervisors

- Sixty six percent (66%) felt having a mentor did not help and of those who were dissatisfied (29) 21 (72% valid) said they did not advise their mentor.
- technical skills, role model of supervisors (staff on-site not mentors) was rated quite high
- vast majority (90% valid) felt PDY helpful and equipped them. The open ended items explaining why it equipped them was that they felt they were not ready for full independent practice. The PDY provides a cap on the responsibility and therefore allows a transition.
- on the whole (89%) they felt 12 months appropriate

Employers and Manager Items (21 respondents)

Items as numbered in the survey

Is the PDY useful?

- Yes 20 (95% valid)
- No 1

Would there be more benefit to have 6 month with a possible 6 month extension?

** not sure why the respondents have gone to a total of 26

- yes 5 (19% valid)
- No 21 (81% valid)

If 6 months, would you have difficulty recommending an extension?

- Yes 10
- No 16 (62% valid)

At what point are most PDYs satisfactory?

- Three Months (3) 0
- Six Months (6) 3 (14% valid)
- Nine Months (9) 13 (62% valid)
- Twelve Months (12) 5 (24% valid)

Does fulfilling PDY stretch your resources?

- Yes 10 (48% valid)
- No 11 (52% valid)

Would you like changes to PDY?

- Yes 14 (54% valid)
- No 12 (46% valid)

What change would you make?

- Very diverse responses with no theme emerging but a small number expressed concern that the range of practice experienced by the PDY needs to include PET/CT

Key points from feedback about employers/managers

- almost all (95%) thought the PDY was useful
- only 19% thought 6 months with a possible 6 months extension was of use which fits with only 14% perceiving that most PDYs are ready at six months
- almost half (48%) taking a PDY is a burden to the resources in the dept
- just over half (54%) would like changes to the PDY but there were no common themes

Appendix 3: Focused Literature Review

The importance of ensuring safe and competent practice in newly qualified healthcare graduates is crucial but at this time of rapid change and working with minimal staffing levels is even more important (Atyeo, Adamson and Cant 2001; Bjorkström, Athlin and Johansson 2008). Over the past two decades there has been a worldwide shift to transform many of the healthcare disciplines into professions e.g. nursing and paramedics. In doing this, education has moved to a minimum of a Bachelor's degree at University and a greater expectation for autonomous, critical and creative practice at the time of graduation (Bjorkström, Athlin and Johansson 2008). The shift away from an apprentice style education has reduced the real life clinical experience provided as a student. At the same time there is an expectation for higher order practice at the time of graduation. This dichotomy creates substantial pressure on those newly qualified entering clinical practice. In order to overcome what may be perceived as a gap in practice readiness, many disciplines use an internship system and/or mentoring to support the development and ensure safe and competent practice of newly qualified practitioners.

In the case of Australian nuclear medicine, change has been substantial over the past decade with a rapid increase in PET usage and the introduction of hybrid modalities. In addition, more services have been performed with fewer staff. Between the years 2001 and 2006, the nuclear medicine scientist workforce in Australia reduced by 4.9 percent, while service provision rose 14.2 percent. By comparison, diagnostic radiographers who experienced a similar increased in service provision (14.7%) encountered a workforce increase of 9 percent for the same period (Adams et al. 2009).

The changes in nuclear medicine healthcare provision make it difficult for education providers to keep their curriculum current and have graduates exit with all that is required for the contemporary workplace. It takes time for curriculum change and implementation; particularly in ensuring students obtain the breadth of clinical placement experience during this period of flux.

The high numbers of younger workers in nuclear medicine creates potential problems with support both for students on clinical placement and newly qualified graduates. In 2006, 44.5% of the national workforce was aged <30 years whereas radiography has an older workforce with 52.3% < 40 years (Adams et al. 2009). Many nuclear medicine scientists only stay working in nuclear medicine for 5 – 10 years before seeking alternate careers (Adams et al. 2009).

Literature Review Method

The database Scopus which includes Medline was used to search for relevant literature. The following limits were applied to the search; only articles or reviews, between the years 1995 - 2010, in the health sciences and written in English.

A keyword search was conducted (see Table 1 for keywords and results). For each keyword search, the title and abstract were reviewed for suitability. A focus on identifying empirical data was made with the exception of descriptive articles that were very closely aligned with nuclear medicine scientists or the Australian setting. If the title/abstract was deemed relevant, a review of the full text article was made to determine the paper's suitability for inclusion in the literature review.

The search was conducted in two key dimensions - practice readiness post graduation and the effectiveness of mentoring in developing and supporting practice readiness. In addition, hand searching such as a review of the reference lists within full text reviews was conducted. The hand searching identified another 6 articles for inclusion.

The search strategy identified 189 titles/abstracts for review, of these, 34 papers were reviewed in full text. The literature review consists of 15 articles with summaries of each article provided (see Appendix 3).

Table 1: Keyword search results in Scopus

Keywords	Results
Post qualifying programmes	19
Graduate clinical readiness	40
New graduate mentoring	80
Professional development phase	5
New graduate preparedness	29
Radiation technologist professional development	10
Total title and abstract scanned	183 + 6 articles identified by hand searching

Overview of the Literature

Of the 15 articles deemed appropriate for inclusion, 12 were related to what has been termed 'practice readiness' in this literature review. The remaining three were related to facilitating the transition from student to a practice ready graduate by way of mentoring or preceptor programs. Mentoring was not the focus of the literature review but in order to provide a more complete picture of the gaps and or support for the transition from student to qualified practitioner, some articles have been included.

Constraints when Considering the Literature

There is very little literature related specifically to medical radiation scientists and their level of practice readiness in the first year post graduation. The majority of research relevant to practice readiness has been conducted on doctors and nurses. In light of this, the review concentrated on findings related to degree program graduates and evaluations of Australian healthcare practitioners as these are more readily compared to the Australian nuclear medicine scientist environment.

The vast majority of evaluations of practice readiness are conducted by self-report questionnaire, not an actual measure of skills, knowledge and attributes. The actual measurement of practice readiness i.e. knowledge, competence and the ability to readily socialise in the workplace, is difficult to perform and infrequently reported. In this literature review, survey by self-report questionnaire was the methodology employed in 11/12 practice readiness articles. Participants in the studies were either the graduates (5/12 articles), qualified staff working with graduates (3/12 articles) or both (4/12 articles). Perceptions of preparedness have a place in understanding

practice readiness but the findings must be considered with some caution, as the expectations of those responding may be quite variable.

The studies in this review were often performed in only one setting, with a small number of participants and one educational institution. Generalising the findings is therefore limited. However, there are similarities across the disciplines which may make it possible to consider findings from other disciplines such as nursing or very different educational settings such as in medicine that are applicable to nuclear medicine scientist graduates in Australia. The findings of Smeby and Vagan (2008) confirm this when they compared newly qualified nurses and doctors and found that there were relatively small differences in their self-reported level of preparedness. The authors hypothesised that there would be differences based on the substantial difference in educational focus and delivery but their findings allowed them to reject this hypothesis.

On the whole, the methodology used in the research reported was robust, with many of the surveys using validated instruments. Often quantitative data was reported in addition to qualitative findings. Quite a few research teams employed statistical analysis to validate their research instrument and analyse their findings.

Summary of Findings

The presentation of findings from the literature is given under key themes. Where possible terms have been standardised to make reading more consistent with the Australian setting e.g. preceptors = mentors, preceptees = mentees. Summaries of each of the articles used in the literature review are found in Appendix 3. The reference includes the country where the study was performed.

Practice Readiness

A range of approaches were taken in evaluating practice readiness. Some studies reported practice readiness from a global perspective e.g. knowledge, competence and the ability to readily socialise in the workplace, whereas others reported on a specific aspect of practice e.g. job satisfaction. This variation in approach makes it difficult to come to a consensus about the level of readiness of new healthcare graduates entering practice.

When reviewing the experienced staff perspective to that of the new graduate, there were no significant differences between the two ratings although the experienced practitioner typically rated lower than the new graduate. It was encouraging to find that when both perspectives were obtained (4/12 articles), there were similar patterns to the perceived level of readiness which adds confidence to self-reported results.

The range in level of practice readiness is highlighted in the following two extreme examples. In the case of one small study of Australian occupational therapists (Doherty, Stagnitti and Schoo 2009) the graduates felt they were prepared to practice as occupational therapists immediately after graduation. The respondents reported their greatest strengths in being able to work in a client centred manner, autonomously and as part of a team, problem solve, think creatively, ask for help when needed and have an extensive knowledge of evidence based practice. Even with these perceived strengths, the graduates still felt the greatest limitation of their program was a lack of block placements specifically in acute or hospital placements. In contrast to the occupational therapist study, a larger study of consultants and specialist registrars perceptions of first year doctors in the UK found they were unprepared or very unprepared in 48 of 70 items (Matheson and Matheson 2009). Practical skills such as inserting a nasogastric tube and suturing were ranked as the most poorly prepared.

Holland et al. (2010) in a large cross-sectional survey about nurse practice readiness, reports that managers in Scotland did not expect graduates to know everything and do everything when they first entered practice. The authors conclude that given the diversity and ever changing nature of practice and the variation in exposure to these settings by students during their learning, it is not possible to guarantee that the graduate has all that is required for a specific area on graduation. The "uniqueness" of the students' clinical practice experience came out in the wide range of responses in the focus groups.

They note that for graduates, it is “only the beginning of a lifelong learning experience and the development of expertise”. In the case of Australian new graduates from physiotherapy, 20% reported they were inadequately prepared

clinically to use some commonly available and frequently used electrophysical agents primarily because they had insufficient exposure to them throughout their education. As a consequence they "required support when first entering practice" (Chipchase, Williams and Robertson 2008). This concern of students not experiencing a wide enough range of practice is valid in the Australian nuclear medicine scientist situation. Adams et al. (2008a) reports that half the centres in their study used a centralised pharmacy and performed a very small range of studies i.e. bone and myocardial perfusion. The skills required in these centres are very different to those required in a public hospital that has its own hot lab and performs a large range of procedures, in addition to critically ill patients. The experience of the student is therefore crucial to the extent to which they have been prepared for the full range of nuclear medicine practice.

Identified Areas of Deficiency

A clustering of all findings identified the following areas of deficiency in the first year of practice post qualification. Three of the 12 articles identified a lack in time management and prioritising workload for newly qualified staff. Closely aligned with this theme was working in difficult situations such as an ability to work under pressure and communication with difficult clients (3/12 articles). In addition, Santucci (2004) in discussing mentoring of new graduates notes that new graduates have difficulty in managing competing demands and an inadequacy to prioritise interventions. A basic lack of skills was identified in two articles and specific knowledge in one. It is clear that the more frequently reported deficiencies of time management and dealing with difficulties are skills that can only be gained by practice in the real setting and not skills that can be developed to a sufficient level at University.

Time to Practice Readiness

It is clear from this literature review, that in general, the vast majority of newly qualified graduates cannot enter practice with the skills and knowledge required for all situations that present themselves in healthcare, and immediately socialise into the new organisation. Smeby and Vagan (2008) and Holland et al (2010) note that it is unrealistic to expect full practice readiness of any graduate in today's health

setting. Authors in this literature review are consistent in their perception that a transition period for new graduates is required but the length of support is variable.

Roxburgh et al (2009) reports that the "initial skill deficits in nurses quickly disappeared with exposure to practice and on-the-job learning" (p77) and that a recommendation of the UK Project 2000 was to provide mentoring for the first 3-4 months. Gome, Paltridge and Inder (2008) reported a statistically significant increase in practice readiness from week 1 to week 10 for interns. The interns retrospectively felt they were better prepared than they initially perceived but obviously the 10 weeks of experience brought substantial change to the level of readiness. Wolff, Pesut and Regan (2010) felt that practice readiness was related more to the individual and could require anywhere between 3 months to 2 years.

Bartlett (2000) shows a developmental increase over 12 months and notes the importance of support to help develop professional self, particularly in areas of ability to observe and diagnose client needs and the individual's confidence and assertiveness. This is supported by Bjorkström, Athlin and Johansson (2008) who identified that practical skills significantly increased from student to just before graduation but not from graduation to 5 years of practice. However, broader professional skills such as drive, flexibility, ability to teach, ability to communicate and sociability increased significantly over the three time points i.e. student, just before graduation and 5 years post graduation. Atyeo, Adamson and Cant (2001) also support this notion that some higher order professional skills are not expected immediately after graduation and need further development. As an example, although experienced medical radiation science practitioners in Australia perceive that an ability to co-ordinate individuals to work together effectively is an important skill for the new graduate to have, 40% of respondents felt these skills should be developed in the workplace and not in their curriculum.

Support Required to Achieve Practice Readiness

Given the identified shortcomings and unrealistic expectation that newly qualified graduates can be expected to have all aspects of professional practice at the time of entering the workforce, it is important to determine what is needed to support this development. Smeby and Vagan (2008) note that relational knowledge

(interpersonal skills) is best learned and developed in actual practice e.g. learning to cooperate, communication and an ability to make ethical decisions. The authors also note that in the case of doctors as compared to other healthcare practitioners, there is a well established structured support for their internship, with professional guidance and supervision by senior physicians. The authors consider this type of support to be equally important for all healthcare practitioners.

Findings which concur with the concept of providing a structured program of support in the early stage of newly qualified graduates are also present in the literature. Barrett and Myrick (2008) found that a positive effect on mentees' clinical performance was associated with those who had a high level of job satisfaction. This finding connects with those of Beecroft et al. (2006) where they report the mentor could be instrumental in retention of new graduates by increasing their confidence and/or compensating for poor working relationships. In other words, mentoring helps retention because it provides support to the mentee by reducing stressors. Stress or job demands that are not off-set by job rewards are a major factor leading to withdrawal from the job (Bakker and Demerouti, 2007).

Roxburgh et al. (2010) found a moderate positive correlation between self-report competency and self-efficacy. Self-efficacy as used by the authors is primarily the level of self-confidence of an individual. The authors also report that there was a positive relationship between psychological job demand and support from supervisors. Overall this indicates that newly qualified graduates can experience quite high levels of stress when first entering work and that support from experienced staff helps to overcome the challenges of practice as an employee i.e. the transition from student to graduate. This concept of mentors assisting in retention may be important to the Australian nuclear medicine scientist population where attrition is quite high, particularly in the first 5 years of practice (Adams et al. 2008b).

The key issues leading to positive learning in the workplace are identified as supportive supervisors, an environment that fosters asking questions and role modelling (Gome, Paltridge and Inder, 2008; Santucci, 2004; Steele and Yielder, 2004). Beecroft et al. (2006) report a successful supervisory relationship requires; trust, communication and rapport, an atmosphere of support, advocacy, effective

communication and openness. Feedback is essential to a developmental process. An interesting point brought out by Beecroft et al. (2006) is that novice supervisors may manifest authoritarianism and over confidence. The authors note that it is important to have supervision of new mentors to overcome this potential problem.

Problems with Providing Adequate Support

One of the challenges reported to providing support for graduates was that of a workforce that is inexperienced and in chronic shortage. New graduates in nursing are often required to work in acute care settings instead of the more stable chronic care because of staff shortages (Wolff, Pesut and Regan 2010). A problem with workforces where there is a predominance of inexperienced workers i.e. less than 5 years post graduation makes it difficult to provide adequate support to new graduates (Wolff, Pesut and Regan 2010). Santucci (2004) also identified that with a large influx of new graduates the ratio of inexperienced nurses increased and mentor problems arose leading to poor supervision and burnout.

In 2005 in Australia, more than half the nuclear medicine scientist workforce was aged less than 35 years and attrition was reported at 12% (Adams et al. 2008b). The high levels of a relatively inexperienced workforce in Australia may be a substantial issue for mentoring but what may be of a greater concern is the quality of work being performed. In 2005, Adams et al. (2008a) reported that over half the centres who responded to a survey in NSW, QLD and ACT employed two or fewer full time equivalent nuclear medicine scientists and had two gamma cameras on site. If both these individuals have less than five years experience, the quality and safety of the work performed may be at risk.

Although the new graduates in healthcare appear to be generally ready for practice, they do enter the workplace with some limitations. The extent to which they have experienced a wide range of unique situations and the level of responsibility given throughout their education will impact on their ability to manage successfully as newly qualified practitioners. On the whole, newly qualified practitioners have a limited ability in managing difficult situations and prioritising their workload. To overcome these deficiencies, further experience is required with role modelling and mentoring to develop into a safe and competent practitioner.

There is a clear distinction between experience gained as a student and that as an employee. The time between the last clinical placement as a student and that of an employee may only be short but the expectations between the two are considerably different (Santucci 2004). A student will not be given the same level of responsibility as that of a new graduate or be working directly under contract with the organisation. The contract for employment encompasses a legal liability to uphold the organisation's goals etc. and to hold their own professional indemnity insurance or be under that of the organisation.

As a consequence to the clear difference between student and new employee, the literature supports the notion of a transition period for newly qualified practitioners. This transition period is to support the development of the graduate, and ensure safe and competent practice during this early phase of the professional's career. Qualified staff shortages or high proportions of inexperienced staff may create problems in providing adequate support to the new employee.

Appendix 4: Summaries of the full text papers in focused literature review

Practice Readiness

Atyeo J., Adamson B., Cant R (2001) Managerial skills for new practitioners in Medical Radiation Sciences in Australia: Implications for the tertiary education sector*. *Radiography* 7:235-247 Australia

Aim
Examined the appropriateness and scope of managerial skills considered important for new medical radiation science practitioners and the likely impact on curriculum planning.

Method
Survey by questionnaire using a 5-point scale. Participants, experienced practitioners n=243 (59% response rate).

Findings
40% of practitioners felt that managerial skills should not be provided in the UG curriculum. The managerial skills ranked as 'very important' were being able to prioritise work tasks; be able to demonstrate good time management skills; be able to market one's own profession; be responsible for a quality assurance project; have skills suitable for resolving interpersonal conflict in the workplace. The skills expected of new graduates were: time and staff relations; organisational practices; self-promotion and career path; legislative knowledge; teamwork; policy and procedures; and resource management.

Limitations
No evaluation of whether graduates had the managerial skills just an evaluation of the skills required for the workplace to inform curriculum.

Bartlett HP (2000) A comparison of the nursing competence of graduates and diplomats from UK nursing programmes. *Journal of Clinical Nursing* 9:369-381 UK

Aim
To compare outcomes of two different education programmes.

Method
Longitudinal survey using questionnaire over three time periods - Time 1 = on graduation, Time 2 at 6 months post graduation, Time 3 at 12 months post graduation. Questionnaire using a 4-point scale. Participants, 2 x graduate groups - bachelors (4 year course) n= 52 (63% response rate) and diploma (3 year course) n=28 (68% response rate). Mentors for graduates the graduates were surveyed. Bachelor mentors n=40. Diploma mentors n=17.

Findings
Mentor findings were not significantly different for each group. On graduation diploma grads had a significantly higher level of leadership than bachelors but at 12 months (Time 3) this was not different. At Time 2 (6 months) Bachelors graduates were significantly higher in: professional development - participation in continuing

education and upgrading of professional standards; assessment - ability to observe and diagnose client needs; ego strength - confidence and assertiveness. The authors note that the differences from graduation to the later time period show the importance of providing support and opportunities for the graduate to develop their competencies (need preceptorship for newly qualified staff).

Limitations
No real life performance was assessed - all perceptions. The study design with the mentors also assessing gave strength to this limitation especially when their report was similar to that of the graduates.

Barrett C., Myrick F (1998) Job satisfaction in preceptorship and its effect on the clinical performance of the preceptee. *Journal of Advanced Nursing* 27:364-371 Canada

Aim
To investigate preceptor/preceptee job satisfaction and to determine if it affects preceptee clinical performance. Preceptors in this article are defined as individuals who are a role model, teacher, and counsellor for the nursing student in the clinical setting. Preceptees are the students who are assigned clients under the direct supervision of a preceptor.

Method
Comparison survey using questionnaire. Setting in three Universities. Correlation of findings from a job descriptive index questionnaire measuring overall job satisfaction. Three research questions answered. One: what is the overall job satisfaction for preceptors and preceptees? Two: what is the preceptor/ preceptees perception of preceptee clinical performance? Three: is there a relationship between preceptor/ preceptee job satisfaction and preceptee clinical performance?
Participants, preceptors n=35 and preceptees n = 33. Of the preceptees, 25 were in 4th year and 8 in 3rd year.

Findings
Only research questions (Q) 2 and 3 are relevant to this literature review. Research Q2 findings - preceptors rated preceptees clinical performance lower than did the preceptees especially in critical care and professional development but this was not significant. Research Q3 findings - significant differences in all five variables with preceptees job satisfaction and clinical performance e.g. low job satisfaction = lower clinical performance. No significant difference between preceptors level of job satisfaction and the preceptees clinical performance.

Limitations
Although the preceptees were still students, they were mostly in their final year and therefore applicable to this review i.e. not much difference between final year students and entering the workforce, although the expectations of performance are different. A small cohort.

BJorkstrom ME., Athlin EE., Johansson IS (2008) Nurses' development of professional self-from being a nursing student in a baccalaureate programme to an experienced nurse. *Journal of Clinical Nursing* 17;1380-1391 Sweden

Aim
To investigate how baccalaureate degree nurses conceive their professional self over time, from being students until some years after graduation.

Method
Longitudinal survey using questionnaire. Time 1 upon entering the degree. Time 2 just before graduation. Time 3, 3 - 5 years post graduation. Judgement of professional self made up of knowledge, values and skills. A validated questionnaire used (nurse self-description form) plus practical skills. Participants students who then became graduates Time 1 n=163, Time 2 n=124, Time 3 n=82. Those that replied to all three questionnaires n=67.

Findings
Generally professional self rated quite highly over three time periods. 6 items increased significantly over time - drive, objectivity, flexibility, ability to teach, ability to communicate, sociability. One item, 'knowledge mastery' decreased significantly over time. When analysing the group that responded to all 3 questionnaires (67/163) 'practical skills' were found to have a significant difference between Times 1 and 2 i.e. upon entering the degree and just before graduation but not for Time 3. This did not occur when comparing separate data collections.

Limitations
Only from one University. The whole group wasn't consistent over time but there was a high response rate for Times 1 and 2 and an acceptable response rate Time 3. Only 67/163 respondents from all three time periods.

Chipchase LS., Williams MT., Robertson VJ (2008) Preparedness of new graduate Australian physiotherapists in the use of electrophysical agents. *Physiotherapy* 94:274-280 Australia

Aim
To determine the perceptions of physiotherapists concerning the preparedness of new graduates using electrophysical agents (EPAs) in clinical practice.

Method
Comparison surveys by questionnaire. Survey one participants were new graduates with less than or equal to 2 years n=350. Survey two participants were experienced practitioners with greater than 2 years experience n=3127. Population survey (n=12,983) with n= 3538 respondents.

Findings
Overall experienced practitioners rated preparedness of new graduates lower than the new graduates did themselves. However the pattern of responses was similar between the two groups. New graduates perceived themselves reasonably prepared for commonly used EPAs but 20% felt unprepared for some of these. There was a range of less frequently used EPAs (but still a fundamental treatment strategy) where new graduates felt unprepared. Experienced practitioners felt new graduates

were not meeting the needs of the workplace in this area of practice. Authors note this lack of preparedness requires either 1. supervision of new graduates or 2. a change to the curriculum to ensure the skills are adequate on graduation.

Limitations
Low response rate 27% but authors analysed the respondents' demographics and found it to be representative of the population.

Doherty G., Stagnitti K., Schoo AMM (2009) From student to therapist: Follow up of a first cohort of bachelor of occupational therapy students. *Australian Occupational Therapy Journal* 56: 341-349 Australia

Aim
To investigate the perception of graduate students on their preparation for practice at 7 months post graduation.

Method
Survey by questionnaire, using a Likert 1 - 7 scale. Participants n=17 graduates (response rate 58%).

Findings
A positive significant relationship between 'overall the program provided graduates with a good basis for practice' and occupational core units prepared students for practice. Graduates noted that a limitation of their preparation was a lack of block placements in acute or hospital settings and limited time spent in developing technical or practical occupational therapy skills in class. An overall perception was that their UG program prepared them to enter the workforce and practice as an occupational therapist. The respondents perceived their greatest strengths to work in a client centred manner, work autonomously and as a team member, problem solve, to think creatively, to ask for help when necessary and an extensive knowledge of evidence based practice.

Limitations
The generalisability of the findings are limited due to the design using only one university and a small cohort. Only a self-evaluation of readiness it was not compared to those they work with.

Gome JJ., Paltridge D., Inder WJ (2008) Review of intern preparedness and education experiences in General Medicine. *Internal Medicine Journal* 38:249-253 Australia

Aim
To assess interns preparedness before commencing and on completion of their rotation in General Medicine, and their attitudes towards educational experiences at a tertiary metropolitan teaching hospital.

Method
Longitudinal survey. Weeks 1 and 10 of the General Medicine rotation. Questionnaire used a 5-point Likert scale for level of preparedness. Participants, interns n=25.

Findings
Week 1 - perceived preparedness was fine except in the areas of resuscitation skills and medico-legal issues. At week 10 there was a statistically increased level of perception in the areas of theoretical knowledge, diagnostic skills, procedural skills including resuscitation and appreciation of medico-legal issues. Generally the interns felt they were adequately prepared. The respondents ranked the most useful i.e. those that supported learning and development education experiences during this 10 week period, with informal teaching from the registrar; informal teaching from the consultant; peer presented education sessions; department meetings; and critical care simulations the most useful. The least useful were: on-line education; formal consultant teaching; and Grand Rounds. The key issues leading to positive learning were: supportive supervisors; an environment that fostered asking questions; and role modelling.

Limitations
Small cohort with all participants from one educational institution.

Holland K., Roxburgh M., Johnson M., Topping K., Watson R., Lauder W., Porter M (2010) Fitness for practice in nursing and midwifery education in Scotland, United Kingdom. *Journal of Clinical Nursing* 19:461-469 UK

Aim
A report of findings from a major study that evaluated the *Fitness for Practice* nursing and midwifery curriculum in Scotland

Method
A national evaluation study. Two aspects of the study were to evaluate the impact of the programs in Scotland in terms of fitness for practice and the impact of the one year development program for newly qualified nurses. Semi-structured interviews with narrative style and thematic analysis used to evaluate these aspects. Participants included students (n=78), mentors (n=78), practice-education facilitators (n=24), academics (n=59), senior clinical (n=46) and education managers (n=16), service users and carers (n=10).

Findings
The concept *Fitness for Practice* involved being competent and safe. Mentors felt an increased responsibility to determine fitness for practice and did not like to fail students. There were perceived variations in the levels of fitness for practice at the point of registration which creates a problem with reliability of assessment. Students experienced good and bad mentors in practice. Managers did not expect graduates to know everything and do everything when they first entered practice. The authors note that at the point of registration it is only the "beginning of a lifelong learning experience and the development of expertise in the role of a registered nurse".

Limitations
Qualitative findings only.

Matheson C., Matheson D (2009) How well prepared are medical students for their first year as doctors? The views of consultants and Specialist registrars in two teaching hospitals. *Postgraduate Medical Journal* 85:582-589 UK

Aim
Determine the preparedness for practice of first year doctors; rate the importance of competencies; triangulate the preparedness of competencies with generic questions.

Method
Survey by questionnaire. 1 -5 scale used to rank the preparedness of first year doctors in two hospitals. Participants, consultants n=107 (response rate 45%) and specialist registrars n= 121 (response rate 59%). Questionnaires were sent when first year doctors had completed 6 of 12 months prior to being fully registered.

Findings
A high level of correlation between consultants and specialist registrars views. 48/70 items were rated as unprepared or very unprepared in relation to the first years doctors level of preparedness. The most lowly ranked skills were use a nebuliser correctly, injections and suturing. Communication with difficult patients was identified as 'most unprepared'. Only 6/20 clinical and practical skills were rated as being prepared.

Limitations
A snapshot of opinions in two hospitals.

Roxburgh M., Lauder W., Topping K., Holland K., Johnson M., Watson R (2010) Early findings from an evaluation of a post-registration staff development programme: The Flying Start NHS initiative in Scotland. *Nurse Education in Practice* 10:76-81 Scotland, UK

Aim
To establish levels of self-report competency, self-efficacy, job demands and career intentions in newly qualified nurses undertaking the Flying Start NHS programme.

Method
Survey using a questionnaire. Competence measured by validated instruments including demographics, personal and career aspirations, job demands, self-report competence and self-efficacy (confidence). Participants were newly qualified nurses from diploma (n=40) or degree (n=50) programs. Convenience sample.

Findings
The mean sample competency score was 62.39 (SD 7.45) with no significant difference in self-reported level of competence between degree and diploma participants. There was a moderate positive correlation between self-report competency and self-efficacy. The authors report that these participants had a higher level of competence reported than did 2nd and 3rd year students using the same instrument in an earlier study by Lauder et al. (2008). A positive relationship between psychological job demand and support from supervisors was found. Variables that were a significant predictor of self-report competency were; skills discretion, supervisory support, co-worker support, psychological job demands, decision authority, self-efficacy and pre-registration exit point.

Limitations
A convenience sample which may not be representative of the population.

Smeby JC., Vagan A (2008) Recontextualising professional knowledge - newly qualified nurses and physicians. *Journal of Education and Work* 21:159-173 Norway

Aim
Aim to establish how well initial education prepared the respondents for practice. Examines different knowledge demands of newly qualified nurses and physicians and the extent to which professionals report to have acquired these during their initial education.

Method
Longitudinal survey using questionnaire with a 5-point scale. Theory-practice gap distinguished into three aspects - codified, practical and relational knowledge. Two questionnaires at Time 1 in their final semester of education and Time 2 at 3 years post graduation. Participants were nurses and physicians. In some cases there were different respondents to Time 1 and 2 surveys. Response rate physicians Time 1 n=138 (75% response rate); Time 2 n=155 (59%). Both questionnaires n=98. Nurses Time 1 n=335 (64%) Time 2 n= 233 (54%). Nurses both n=179.

Findings
Knowledge gaps were defined as when the knowledge demands did not equal the knowledge acquired. Generally nurses reported greater knowledge gaps than physicians. Nurses report the greatest gaps in all aspects of practical knowledge especially 'ability to work under pressure' and 'specific knowledge'. Authors identify that relational knowledge is best learned and developed in professional practice e.g. learning to cooperate, communication, and ability to make ethical decisions. Authors identify that the doctors with their internship get professional guidance and supervision by senior physicians which helps in their professional development. The authors noted that education cannot prepare students for all that is required in the workplace.

Limitations
The authors note that the quantitative indicators are "rather simple indicators" and further work required to fully understand the complex processes of professional practice.

Wolff AC., Pesut B., Regan S (2010) New graduate nurse practice readiness: Perspectives on the context shaping our understanding and expectations. *Nurse Education Today* 30:187-191 Canada

Aim
Explore the perspectives of nurses about the readiness of new graduates.

Method
Focus groups x 15 – interviews. Participants, nurse educators/ administrators n=150. Multiple sites/ sectors included - 11 in practice, 3 in the education sector and 1 in the regulatory sector.

Findings
Participants felt practice readiness developed between 3 months to 2 years. The most often perceived deficiencies were performing basic nursing skills, managing client workload, setting priorities and making appropriate clinical judgements. Participants felt there was a need for a transition period where support was needed. Challenges to practice readiness were considered to be: the changing nature of nursing education (move from technical to professional) and the increasingly complex healthcare environments; the changing nature of healthcare e.g. in acute care registered nurses manage patients whereas in more stable wards enrolled nurses manage the patients; chronic staff shortages create wards where the "senior" nurses have only five years experience and therefore traditional mentoring and support is absent; despite the desire for a transitional period many new graduates were being given full acutely ill patient loads; orientations to new staff were very limited. Some of the participants noted the stress and moral dilemma they felt by being unable to provide the mentoring and support to new staff thereby risking patient care but the organisation did not provide the time or framework to give the support required. The authors note that there should be a shared responsibility for the preparation of graduates i.e. government, regulatory bodies, education providers and healthcare providers.

Limitations
The authors identify the discrepancy of perception of what constitutes practice readiness and therefore the complexity when making sense of the information.

Mentoring

Beecroft PC., Santner S., Lacy ML., Kunzman L., Dorey F (2006) New graduate nurses' perceptions of mentoring: Six-year programme evaluation. *Journal of Advanced Nursing* 55:736-747 USA

Aim
A report of data from an evaluation study to determine whether new graduate nurses 1. were satisfactorily matched with mentors 2. received guidance and support 3. attained socialization into the nursing profession 4. benefited from having a role model for acquisition of professional behaviours 5. maintained contact with mentors and 6. were satisfied with mentorship.

Method
Survey using questionnaire. The three themes in this study are - satisfaction, support, socialization which was part of a larger study. Participants, new graduates (mentees) n=318. Collected from 1999 – 2005.

Findings
Of the 58% of all positively coded comments, 44% related to satisfaction and 31% to support. Of the negatively coded comments, program logistics was the most frequently reported at 72%. 83% of mentees 'clicked with their mentors'. 80-90% of respondents felt their mentor provided the guidance and feedback they would have liked. The major personal benefit reported from having a mentor was support. 54% reported they met regularly with their mentor. Authors report successful supervisory relationship needs trust, communication and rapport, an atmosphere of support, advocacy, effective communication and openness. Feedback is essential in the

supervisory relationship. The authors identify that 'novice supervisors' may manifest overconfidence and authoritarianism and therefore it is necessary to provide training to overcome these potential problems. Authors note that post registration supervision focuses on providing support for professional growth and development.

Limitations
Responses were from the mentees perceptions only. No data obtained from the mentors.

Santucci J (2004) Facilitating the transition into nursing practice: concepts and strategies for mentoring new graduates. *Journal for Nurses in Staff Development (*official journal of the National Nursing Staff Development Organization), 20:274-284 USA

Aim
Description of the concepts and components of a speciality orientation program to assist the transition from student to nurse.

Method
Discussion paper.

Findings
Orientation programs needed to foster safe, competent practice yet be cost effective. In the USA an influx of new graduates means there is a far greater ratio of inexperienced nurses. The authors note that advanced beginners have difficulty managing competing demands and an inadequacy to prioritize interventions. The expectations from employers as a student are different to an employee. Often these are unspoken and therefore confusing and stressful. Recognising their learning needs is required and often helped with a preceptor. Some of the suggestions made by the authors for a successful transition are: provide a set of tools for the preceptors to guide and track learning and performance which help to clarify learning needs, provide consistency between preceptors and continues the growth of the beginner. The authors describe their evaluation of the preceptor program.

Limitations
Not an empirical study but some valuable discussion points.

Steele C., Yielder J (2004) Clinical supervision: Designing a model to enhance clinical learning for medical imaging students. *Journal of Diagnostic Radiography and Imaging, (*5):89-97 New Zealand

Aim
To propose a model of clinical supervision that supports and extends medical imaging students at their clinical placement

Method
Literature review and practical application

Findings
Authors report successful supervisory relationship needs trust, communication and rapport, an atmosphere of support, advocacy, effective communication and

openness. Feedback is essential in the supervisory relationship. The authors identify that 'novice supervisors' may manifest overconfidence and authoritarianism and therefore it is necessary to provide training to overcome these potential problems. Authors note that post registration supervision focuses on providing support for professional growth and development.

Limitations

The study was essentially a case study with literature to support their use of a clinical supervisory model used for UG supervision. It is included because it is associated with medical imaging.