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The DINARC© Toolkit - Clinical Academic Research Capacity-Building and Post-Doctoral Development for Nurses, Midwives and Allied Health Professionals (NMAHP)

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Abstract

The challenges of developing nurses, midwives and AHPs (NMAHPs) as clinical academics (CA) have received international attention. Balancing clinical practice and academic pursuit, often where managers are unfamiliar with academic career requirements, is one such challenge; however, the current literature provides limited developmental guidance. The aim of this article is to describe the DINARC© (Dissemination, Implementation, Networking, Active Research and Clinical practice) Toolkit, a continuous practice development aide for NMAHPs who are in the early post-doctoral phase of a clinical academic career (CAC). We identified five DINARC© elements, through evidence review and synthesis, as requisites for supporting the progression of a CAC. An 'expert reference group' (CAs, academic supervisors and nurse leaders) advised and assisted in development of the DINARC© concept. A Practitioner Research Plan and Mentor–Mentee Discussion Guide was developed and applied within a large metropolitan UK university teaching hospital; this was designed to identify the essential elements required to successfully navigate a CAC pathway. Early feedback from practitioners and managers suggests that DINARC© aids CAs in navigating an early CAC and offers guidance for managers. Further application and evaluation of DINARC© is now required by those developing a CAC. Implications for practice: DINARC© is a resource to guide practitioners' CAC development with the goal of integrating and strengthening clinically-based NMAHP research activities, with related improvements in patient care. We believe that DINARC© has wider relevance as a useful tool, worthy of testing internationally.

Keywords: ***clinical academic; clinical academic careers; DINARC Toolkit***

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Introduction

This article outlines the issues of post-doctoral clinical academic development in NMAHPs and the process of developing and applying a development resource for planning and enhancing clinical-academic role development. It will draw primarily on examples from the UK, but international comparisons will be given throughout, highlighting this as an issue of relevance to other developed international health science systems.

A heightened research culture within healthcare organisations is regarded as a positive influencing factor on delivering high-quality patient care (Boaz, et al., 2015). Additionally, the integral benefits of research and evidence-based care, coupled with a well-educated workforce, is a long-established basis for improving the quality of care (Bennett et al., 2012; Boaz et al., 2015; Rochon et al., 2014). Research has long been accepted as an integral element of medical careers, with the existence of clinical-academic medical roles spanning clinical practice often through publicly funded healthcare organisations and higher educational institutions (HEIs) (UK Clinical Research Collaboration, 2005). However, historically this has not been the case for other professional groups such as NMAHP, with limited investment in this workforce.

The need to create a clinical-academic career pathway for nurses was advocated in a United Kingdom (UK) government report *Modernising Nursing Careers* (Department of Health, 2006) over a decade ago. Nevertheless, in the UK little progress has been made, particularly related to nursing, despite the advent of the most senior clinical nursing role, that of Consultant Nurse, from the late 1990s, which was initially intended not only to lead the development and delivery of high-quality patient care, but also to develop research programmes. Often this did not transpire and in recent years this role has been less commonly adopted by NHS Trusts. Similarly, internationally the Consultant Nurse role has mainly focused on leading advanced care with few countries shaping the role as a means to developing clinical academic nursing careers (Parker & Hill, 2017). However, within the Australian healthcare system the Clinical Nurse Research Consultant role has evolved as a helpful route by which to facilitate practices and advocate for research-based care (Currey et al., 2011). In recent years consultant AHP roles, incorporating research and extended clinical practice, have started to emerge in the UK, although these are relatively new and are still evolving.

Internationally, there is a parallel process of doctoral training for NMAHPs combined with the growing opportunities for NMAHPs to remain clinically based, whilst entering into roles that require research activity, either as individuals or within multidisciplinary clinical-academic teams. Innovation in clinical-academic development has also been seen in countries such as Australia (Currey et al., 2011). However, mainstream clinical role development in areas such as advanced practice in countries such as the USA, Canada, Australia and China, focus on the separate issue of applying research evidence to inform practice decision making (Parker & Hill, 2017) rather than as principal investigators.

This article introduces an aide to Continuous Professional Development (CPD) , entitled *Dissemination, Implementation, Networking, Active Research and Clinical practice (DINARC©) toolkit*. This was developed to assist post-doctoral clinical-academic (CA) career development amongst NMAHPs for national and potentially international application.

Background

The UK National Health Service (NHS) and similarly other established international health systems (e.g. the Johns Hopkins Health Care System in the USA) promote research as a core part of their business and an integral component for delivering innovative high-quality patient care (Department of Health, 2015; Johns Hopkins University, 2018). Similarly, NHS England and higher education institutes (HEIs) acknowledge that research capacity building and the creation of CA roles for NMAHPs and other health professional groups are required to create and sustain research culture within healthcare (Health Education England, 2014; Health Education England /National Institute for Health Research, 2019). Again a similar observation may be made in the USA and other highly developed health systems, for example, the Karolinska Institute in Sweden. More recently it has been recognised that creating and

maintaining a research culture within a healthcare organisation is dependent on wide engagement and participation in research not only for medical practitioners but for NMAHPs. For example, a research culture has been developed within the UK NHS and driven through the development of the National Institute for Health Research (NIHR) (Department of Health, 2006; Health Education England, 2014). There are some parallels with the USA National Institutes for Health, although the NIHR has the additional benefit of being integrated with a single unified health delivery system, which aids collaboration and data sharing.

Nursing, midwifery and AHP academic careers

A key national foundation for NMAHP-CA development in the UK was the Finch (2007) report *Developing the Best Research Professionals* and more recently through the *Strategy for Developing Clinical Academic Researchers within Nursing, Midwifery and the Allied Health Professions* (Finley, 2012). Implementation of the Finch report findings led to a major breakthrough in the UK with the establishment of the NIHR Clinical Academic Training (CAT) Programme in 2008, recently updated as the NIHR Integrated Clinical Academic (ICA) programme. The scheme sought to build research capacity from amongst clinicians with the establishment of clear, funding routes, albeit limited in number, to support their development (Health Education England/National Institute for Health Research, 2019). The creation of a range of opportunities across the career pathway (UK Clinical Research Collaboration, 2007) started the process of preparing NMAHPs to generate, progress and answer pertinent research questions, ensuring that practitioners have the appropriate research skills.

The intention of the NIHR ICA programme was to provide financial assistance, to organisations and those remaining within clinical practice requiring research training, mentorship and funding, and to individuals at a range of clinical grades and academic levels, to progress from internship (pre-Masters), Masters, and other specific awards. These include Pre-doctoral Clinical Academic Fellowship (Masters level), Doctoral (PhD student) Fellowships, Clinical Lectureships (early career post-doctoral) and Senior Clinical Lectureships (mid-career senior post-doctoral) (National Institute for Health Research, n.d.). However, these opportunities are not always apparent to practitioners or their managers, nor are they sufficiently cascaded to frontline staff through HEIs or NHS Trusts. Additionally, in the UK, few NHS Trusts have the infrastructure to support staff with the development of a successful funding or fellowship application or the ability to backfill posts prior to or after a successful award, due to staffing shortages and a lack of understanding regarding timelines associated with such awards (Finley, 2012). Partly this is due to insufficient practice-based, clinically-focussed research leaders and mentors being in place to identify and progress opportunities for knowledge generation and to identify talent and lead programs of research. In their Nothern Ireland study, using a modified nominal group technique, McCance et al. (2007) highlighted the need for strong and visible leadership to grow research capacity successfully, both regionally and nationally.

In the USA the National Institute of Nursing Research (2019) also offers some training opportunities and grants for the development of nurse scientists, but the availability of strategic governmental investment in research capacity building in other countries, beyond doctoral education, is not clearly documented in the literature.

Post-Doctoral Clinical Academic Careers

A key specific challenge observed in the UK is the inadequate support for individuals during the early post-doctoral phase to maintain and actively apply their research skills on return to practice following completion of their research training. A number of NHS organisations and HEI partners are now leading the way with strategies to build research capacity and in particular to develop and retain post-doctoral NMAHPs. One such example can be found at Leeds Teaching Hospitals with the creation of a joint (NHS/HEI) Clinical Research Careers strategy for the Non-Medical Professions (Leeds Teaching Hospitals NHS Trust, 2018). Furthermore, the University of Southampton with its clinical-academic pathway and commitment to training, in addition to a number of joint university-clinical based positions up to professorial level (University of Southampton, 2018). In Sweden, a similar pattern is observed at the Karolinska Institute, although here the professorial supervisors have joint positions with the health and academic facilities (Karolinska Institute, 2018).

Among the challenges during this early post-doctoral phase are: the lack of sustained mentorship; difficulties in adapting to a return to full-time clinical practice; and the lack of research time to consolidate doctoral studies and work towards further awards as part of a wider multidisciplinary clinical academic team. The availability of suitable mentors, with insight and engagement into both research and clinical practice, is also a rare resource but one that is crucial to the development of a means to build capacity. Access to resources to support dissemination, particularly writing for publication and implementation of research findings, are sadly lacking and are often dependent on the local support of managers. Managerial support in many instances does not facilitate continuation of the academic element of the career and its translation to clinical development. This is partly due to a lack of jointly established integrated clinical-academic roles that are research-focused, and to a lack of access to on-going mentorship, and of the means to join applied multidisciplinary health research groups that are linked to clinical services (although examples exist for some AHPs, such as podiatrists within the Leeds Institute of Rheumatic and Musculoskeletal Medicine, an NIHR Biomedical Research Centre). HEI-based research groups may be less adept at identifying opportunities for the early post-doctoral staff to enable them to flourish in the clinical setting, unless joint arrangements are in place to promote integrated working between the HEI and the health service.

Additionally, during their doctoral training staff have experienced a semi-structured programme whilst under supervision, but once the PhD is awarded the formal relationship between student and academic supervisor comes to an end. The supervisor has no formal obligation to continue to support the student or to offer mentorship, although some supervisors do continue this role. However, for those without this continued support the challenges of continuing their research career may lead to frustration and an inability to identify and pursue competitive research opportunities. An ideal clinical base for such staff is to join an existing or emerging multidisciplinary clinical-academic team where there are opportunities to contribute to and develop an existing programme of work and receive on-going mentorship.

Mentorship and guidance may be available to some through their line manager. However, NHS managers may not have the same level of academic experience, training or research knowledge as the post-doctoral employee. Without the appropriate resources and guidance, a manager's lack of awareness of the potential of clinical-academics and their developmental needs may become a barrier to career advancement for the post-doctoral practitioner.

Some helpful resources and documents that have been created in the UK may have wider international relevance for adaptation to the health and university system. These include the *Research Capacity Building Framework* (Cooke, 2005), the NIHR booklet *Building a Research Career* (National Institute for Health Research, 2015), the AUKUH CA training pathway for NMAHP (Finley, 2012), the clinical academic pathway capability framework (Westwood & Richardson, 2014) and the AUKUH *Transforming Healthcare Through Nursing, Midwifery and Allied Health Professionals Research Clinical Academic Roles* (Carrick-Sen et al., 2016). These helpful guides also demonstrate a shift in culture towards the support of not only medical practitioners but also NMAHPs developing as researchers. Evidence has also emerged of clinical academic development in Australia (Davidson et al., 2006), yet the training and preparation is not as yet clear in the literature.

There is a dearth of literature and resources to support and guide this finite talent as currently these documents and resources do not specifically act as a guide for the early post-doctoral practitioner in relation to navigating a clinical academic career. One resource that provides a range of resources to support the professional development of researchers at any stage of their academic career is ©*Vitae* (Vitae, 2019); however, this is a generic resource covering many academic subjects and careers, and, although it offers a range of supportive documentation and resources, it does not include the clinical and practice element required to develop a career in the clinical academic context.

Given this gap in resources, the authors have developed a post-doctoral practitioner toolkit, the *Dissemination, Implementation, Networking, Active Research and Clinical practice (DINARC©) Toolkit,* to support NMAHPs who wish to pursue a clinical-academic career (see Figure 1); it will also have relevance for other health professionals.

Figure 1: Dissemination, Implementation, Networking, Active Research and Clinical (DINARC©) elements

Development of the DINARC© Toolkit

The DINARC© Toolkit embraces the critical elements required to achieve a clinical-academic career particularly for an NMAHP early-career post-doctoral researcher. This was developed by the authors who have a depth of experience regarding leading NMAHP research capacity building within both an HEI and large healthcare organisation, as well as supervisory and mentorship experience with CA staff.

The purpose of the DINARC© tool is to aid developmental progression by offering structure and guidance around the required achievements for a CAC. It is a pragmatic tool used by individuals, mentors, managers and academic supervisors to guide career development and apply milestones against progress. The five stages of the tool, outlined in Figure 1, are interchangeable and the elements within each of the stages interface with each other.

The five core elements of the DINARC© were initially identified as critical elements to progress a clinical academic career (particularly the early post-doctoral stage) through evidence review and synthesis including a range of resources and documents produced by bodies and organisations to help support both individuals and organisations in developing CAC.

The DINARC© concept and tool was then shared and evaluated by an 'expert group', consisting of clinical academics, academic supervisors of practitioners and nurse leaders responsible for research capacity building, on an individual basis. The *Practitioner Research Plan* (see website www.dinarc.com) was then created, incorporating feedback from the expert group, and trialled with six early-career clinical academics. Further refinements, such as gaining funding for patient and public engagement work, were then made following responses from the early-career clinical academics. A *Mentor–Mentee Discussion Guide* (see Table 1 for an annotated version) was developed to aid completion of the *Practitioner Research Plan*, with additional guidance provided through the DINARC© website; the full *Mentor–Mentee Discussion Guide* can be found on the DINARC website.

HOW TO USE THIS GUIDE: Use this guide with your mentor to guide discussion and action planning to assist you with completion of DINARC practitioner plan		
Element of DINARC	ACTION	1TIMELINE
DISSEMINATION Creating a dissemination plan	Peer review abstract dissemination.	By 12 months
	Publishing in peer review journals.	12 to 18 months
	Patient and Public Engagement (PPE) groups.	12 to 18 months
IMPLEMENTATION Develop an implementation plan related to your research findings	Identify the changes in clinical practice / clinical service that are required as part of implementing your findings.	3 months
	Identify key stakeholder required for consultation.	3 months
	In collaboration with stakeholders, develop and agree an implementation plan.	4 months
	Initiate the implementation plan, collecting, analysing and sharing appropriate data to determine the impact of change.	Varied
NETWORKING Develop a networking plan	Identify a mentor (or several) who can help you to determine your developmental needs.	3 months
	Maintain and strengthen links with internal and external clinical colleagues to maintain close links with practice.	On-going
	Establish yourself as a member of a local internal or external (ideally multidisciplinary) research group.	4 months
	Identify and contact potential local, national and international collaborators. This may include academics or clinical academics who work in similar fields to you.	4 to 6 months
ACTIVE RESEARCH Create a research plan	Develop new research ideas and create proposals on a page for ease of discussion with others.	6 months
	During development of the idea, concurrently identify collaborators, suitable grant calls and undertake PPE.	On-going
	Explore personal post-doctoral fellowship opportunities.	Varied
	Develop and apply acquired leadership skills including supporting, mentoring and the academic supervision of others.	On-going
CLINICAL Create clinical skills development plan	In discussion with your manager apply newly gained clinical skills and identify new or evolving skills requiring development.	3 months
	Gain clinical support and mentorship to ensure your continued growth in-line with service and patient need.	On-going

Table 1: Mentor–Mentee Discussion Guide for the use by or with practitioners

The *Practitioner Research Plan* is a 'living' document that can be shared between practitioner, mentor and line manager and it facilitates the use of DINARC©. It is suggested that a timeline is negotiated between the practitioner/early-career researcher, line manager and mentor, ideally before or soon after the doctorate award. This provides a basis to support the researcher in setting goals and milestones related to

dissemination and implementation of research findings as well as formalising the planning of further research and developing the related clinical element of their career. The plan enables the researcher to navigate matters, such as gaining a sponsor, identifying an appropriate mentor, who may be HEI- or NHS-based, and establishing themselves within a local multidisciplinary research team aligned to their chosen clinical specialty. It provides a means to record their developing research interests, crucial planning elements such as Patients and Public Engagement (PPE) activity and enables capture of the resource of wider collaborative networks, both national and international. Working towards a post-doctoral fellowship application or related award may also be an area to be explored and progressed, creating opportunities as a co-applicant on grants; this will eventually support the skill set that leads to their own grant applications. Another key area is the need to continue to develop appropriate clinical skills, but in many cases at an advanced level, and also to explore opportunities for synergies in simultaneously developing academic and clinical development skills. These are all critical milestones for the developing clinical academic.

The researcher's overarching goal for the subsequent 12 to 24 months should be explored prior to developing the plan, to provide a baseline. The timelines will differ for individuals, dependant on their academic maturity, level of current clinical attainment, their role and personal situation and the support available in the academic/clinical context.

In additional to the toolkit, a culture of joint working needs to be established between the local or regional HEIs involved and healthcare organisation for the individual to succeed (Cooke, 2005). In isolation, the toolkit will have limited success unless the individual has 'buy in' from their organisation and their chosen HEI and a shared sense of their complementary roles and resources, with identified support and financial resources being critical enablers to success.

To date, the use of the resource by post-doctoral researchers, their managers and mentors has led to positive feedback, with the suggestion that DINARC© aids useful conversations and helps steer career development. Early adopters within a university teaching hospital have suggested that there is a tendency to focus on completing sections of the *Practitioner Research Plan* that they and their manager/mentor identify as their greatest and current challenge. Evolution and additional refinement of the plan will continue as a greater numbers of CAs adopt and more widely test the resource.

Discussion

A combined and integrated clinical-academic role, including research and clinical practice, would seem a suitable solution to aid the early NMAHP post-doctoral career and knowledge transfer into practice improving patient care (Willis, 2015). However, given their early stage of development, there is currently a dearth of literature evidencing the benefit of such roles. Nevertheless, it could be assumed that these roles aid knowledge generation and, crucially, its clinical application, ensuring that it remains current and close to the complexity of practice and offering an opportunity to enhance the research and development culture within teams and wider clinical services (Finley, 2012; Latter et al., 2011).

Despite these potential benefits the proportion of post-doctoral NMAHPs returning to practice and failing to maintain research activity is unknown due to a lack of literature and investigation into this area. Anecdotally, many report challenges with pursuing and sustaining the academic element due to clinical commitments and lack of on-going academic support/supervision.

The complexities and challenges related to developing such a role are many, one being the financial tensions within hospital and community settings (Coombs et al., 2012). Additionally, there is a need for care in deciding where the role and post-doctoral staff member is situated in the health system, to maximise dissemination and implementation of the newly acquired knowledge and research findings. This is highlighted by the framework for NMAHPs (Westwood & Richardson, 2014), which describes the different levels of clinical and academic attainment to progress a CAC.

In the long term, the individual who has been released from practice to undertake their doctoral studies is likely to continue to require that time to develop during the post-doctoral phase, to develop new research

ideas, to secure grants, publish their work and network to establish new collaborations and establish their place within a research team (Carrick-Sen et al., 2016). Additionally, they require the support of both an academic supervisor (ideally their PhD supervisor) and their healthcare line manager to grow and develop both their academic and clinical skills.

Academic supervision is important to ensure that the individual receives support to disseminate and, in particular, to publish the findings of their PhD. However, when the PhD is finished the formal supervision relationship is also at an end and there is no formal obligation for the PhD supervisor to continue to support the individual during the early post-doctoral stage. Many supervisors have numerous other commitments such as developing and delivering research grants, supervising Masters and PhD students, not to mention teaching or managerial responsibilities that limit their capacity to continue to offer support. Additionally, their healthcare line manager may not have the same level of academic experience, training, or research knowledge as the post-doctoral employee, thereby limiting their ability to guide and support them through the aspects required to develop a clinical academic role. The manager may also not see the benefits for a post-doctoral practitioner to continue their research work nor understand the challenges of establishing a program of research as an early career researcher.

It is therefore essential that during the early post-doctoral stage of a CAC, individuals receive suitable direction and guidance to develop appropriately and ultimately secure grant income and high-level publication (Carrick-Sen et al., 2016). It is also critical that the impact pathway of their research is planned (being built into new proposals) and translated as appropriate into practice and policy where the benefits are then experienced by the healthcare organisation to ensure their on-going support and for future candidates whose potential is identified.

The DINARC© toolkit offers support and guidance to the early career clinical academic, where there is little or no academic supervision and/or the line manager has limited knowledge of what is involved in developing a clinical academic career. Other similar resources may well be available to early career post-doctoral NMAHPs, locally through HEIs or healthcare organisations, although these are not well known or reported in the literature.

One developed resource is ©*Vitae* (Vitae, 2016). This is well known within the research community and is an extremely comprehensive tool that covers all stages of the research career. To access the tool a fee is required, although some HEIs have a licence and offer access to their post-graduate students, staff and in some cases affiliates. ©*Vitae* enables the individual to identify gaps in their knowledge and development, and target areas that they need to progress further to become a well-rounded individual and a future research leader. However, this tool is for all researchers whatever their academic subject, mainly with the intention of supporting those wishing to become purely an academic researcher. It is not designed to address the integral nature of a clinical academic role whereby both the clinical and academic development is symbiotic. It is possible that the use of DINARC© alongside ©*Vitae* may be complementary and offer the early-career clinical academic a more comprehensive insight to their development, although this has not been explored.

Conclusion

Despite strategic calls for the development of post-doctoral clinical academic careers within the field of NMAHP, the specific development needs of the early post-doctoral NMAHP have not been clearly elucidated in the literature. The DINARC© toolkit provides a resource to help practitioners, healthcare organisations and HEIs to address this gap by providing a means of structured tailored support for those NMAHPs wishing to develop and sustain a clinical-academic career.

The applicability of DINARC© and its use in practice is currently receiving on-going evaluation at a large NHS teaching hospital in the UK. The authors would welcome feedback on the use of the toolkit in the UK and other countries to enhance the design of future revisions, and we would welcome feedback on the DINARC© toolkit through the DINARC website.

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