



Research on Teaching of Evidence Based Practice in Ireland - to Healthcare Professionals and Healthcare Students

University College Cork

Summary report

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The Clinical Effectiveness Unit of the National Patient Safety Office for the National Clinical Effectiveness Committee on the advice of its Education and Training Subcommittee.

National Clinical Effectiveness Committee (NCEC)

Clinical effectiveness is a key component of patient safety and quality. The integration of best evidence in service provision, through clinical effectiveness processes, promotes healthcare that is up to date, effective and consistent.

The National Clinical Effectiveness Committee (NCEC) is a Ministerial committee established in 2010 as part of the Patient Safety First Initiative. The NCEC is supported by the Clinical Effectiveness Unit (CEU), Department of Health. The NCEC is a partnership between key stakeholders in patient safety and its mission is to provide a framework for national endorsement of evidence-based clinical guidelines and audit to optimise patient and service-user care.

The NCEC has a subgroup on clinical effectiveness education and training to:

- Guide the development of multidisciplinary education in clinical effectiveness
- Liaise with postgraduate and undergraduate educational organisations to identify mutual goals and areas of interest relevant to clinical effectiveness and evidence based practice
- Make recommendations to the NCEC regarding training and education in clinical effectiveness.

As part of the work of this subgroup, invitations to tender were issued in October 2016 and a public procurement competition held for the conduct of research into the current provision of EBP teaching in Ireland.

Further information on the NCEC and NCEC subgroups is available at www.health.gov.ie/patient-safety/ncec

Copies of the full report are available from the NCEC ncec@health.gov.ie

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Report Summary and Key Observations

Introduction & Background

To highlight and advance the clinical effectiveness and evidence-based practice agendas internationally, the Institute of Medicine (IOM) set a goal that by 2020, 90% of clinical decisions will be supported by accurate, timely and up to date clinical information and will reflect the best available evidence to achieve the best patient outcomes (IOM, 2009). To ensure that future health care users can be assured of receiving such care it is recommended that the healthcare professions incorporate the necessary knowledge, skills and attitudes of EBP into their professional education programmes and registration requirements.

Internationally, Evidence-Based Practice (EBP) is an established healthcare priority. The directive for its promotion arises from the need to achieve the following: (1) improved patient experience of care (including quality and satisfaction), (2) improved health of populations and (3) reduced per capita cost of healthcare (Berwick *et al.*, 2008; Melnyk *et al.*, 2012; Gilliam and Siriwardena, 2014). Accomplishing these healthcare goals involves an emphasis on clinical effectiveness which is a key component of patient safety and quality. The integration of best evidence in service provision, through clinical effectiveness processes, promotes healthcare that is up-to-date, effective and consistent (Department of Health, (DoH), 2016).

Achieving EBP however is a complex undertaking. One of the most consistent findings in health service research is the gap between best EBP and actual clinical care (Zelenikova *et al.*, 2014). The promotion of EBP requires a healthcare infrastructure committed to supporting organisations to deliver EBP and an education system effective in supporting healthcare professionals in acquiring EBP competencies (Dawes *et al.* 2005). Evidence-based practice is increasingly recognised as a foundation for healthcare education across disciplines and international borders (Dawes *et al.*, 2005; Ilic and Maloney 2014). The acquisition of EBP competencies begins during an individual's professional training. To this end, healthcare education programmes must design curricula that target these competencies (Thomas *et al.*, 2011). It is acknowledged that the development of professional education to facilitate EBP is a major and immediate challenge (Reilly *et al.*, 2004; Dawes *et al.* 2005, Meats *et al.*, 2009; Aglen *et al.*, 2016).

The National Clinical Effectiveness Committee (NCEC) provides strategic leadership for the national clinical effectiveness agenda. It's subgroup on education and training provides advice and support to the NCEC in guiding the development of multidisciplinary health professional education in clinical effectiveness. This involves liaising with educational organisations to identify mutual goals relevant to

clinical effectiveness and evidence-based practice and making recommendations to the NCEC on how 'best practice' can be achieved in these areas (DoH, 2016). There is currently a lack of baseline data on the provision, practice and variation of evidence-based practice education in Irish third level educational organisations and professional training/regulatory bodies across the health professions. The collation and analysis of such data is required to lay the foundation to inform the standards and requirements of education programmes for healthcare professionals in Ireland and contribute to the overall body of evidence for 'best practice' in national clinical effectiveness education.

Aims

The overall aim of this commissioned work was to:

Determine current provision, practice and variation in Evidence-Based Practice (EBP) education in Irish third level healthcare professional education.

Objectives were to:

1. Determine current provision, practice and variation in evidence based practice (EBP) education in Irish third level education.
2. Describe current practice in other English speaking countries (to include UK, Canada, New Zealand and Australia) of how they are delivering EBP education to health care professionals (undergraduate and postgraduate).
3. Inform the development of a core syllabus/curriculum and competencies/competency framework for EBP education in Ireland.
4. Inform standards and requirements for education programmes in evidence based practice for health professionals at Ireland's Higher Level Institutions (HEIs) /courses leading to an award on the National Framework of Qualifications.
5. Act as a baseline study which can be repeated in the future.
6. Contribute to evidence for 'best practice' in national clinical effectiveness education.
7. Inform the content and optimum delivery mode for training programme(s) for the competency and skills required by all relevant stakeholders.
8. Support the NCEC and the Department of Health to provide strategic leadership for the national clinical effectiveness agenda.

Methods

To meet the project aims and objectives, the following three distinct, but interlinked phases of research were conducted.

Phase 1 – Desktop Structured Rapid Review of International Literature

The aim of the review was to provide a summary of current international literature, including grey literature on the standards of education in evidence based practice (EBP) e.g. syllabus/curriculum, competencies, methods of assessment, teaching methods and effectiveness for teaching of evidence based practice. Specific review questions included:

1. What is the current practice of teaching EBP at undergraduate and postgraduate level across the healthcare professions?
2. What are the most effective components of EBP education for healthcare professionals (i.e. mode of delivery, programme components, programme duration, outcome assessment, and effect on EBP competencies)?
3. What are the effective components of EBP curriculum development processes?

A rapid structured review was undertaken, following the Knowledge to Action (KTA) evidence summary approach. Rapid reviews take a streamlined approach to synthesizing evidence in a timely manner and are considered a contextualized resource that succinctly and methodically address a broader scope of scientific evidence quickly. Rapid reviews are typically for the purpose of informing decisions faced by policymakers, decision makers, stakeholders and other knowledge users in healthcare settings (Khangura *et al.*, 2012). An eight-step approach to evidence summary methodology was adopted to ensure adherence to systematic principles associated with rapid reviews. The eight steps included: 1) Needs Assessment, 2) Question development and refinement, 3) Proposal development and approval, 4) Systematic literature review, 5) Screening and selection of studies, 6) Narrative synthesis of including studies (including assignment of evidence level), 7) Report production, and 8) Ongoing follow up and dialogue with knowledge users.

Narrative analysis and synthesis of 83 empirical studies revealed that participation in any form of EBP education has beneficial effects across all EBP competencies. The most apparent trend in positive changes in EBP competencies is seen from multi-modal EBP interventions which address two or more of the five EBP steps. What is not equivocally evident is what form or combination of EBP education components have the most beneficial *long-term* effects, particularly in terms of translating knowledge and skills into clinical application of EBP. Similarly, there is insufficient evidence to suggest that an EBP

intervention will have similar effects across a range of health professions. Due to the large range of instruments used to measure outcomes, changes post intervention must also be interpreted with caution.

Based on the evidence from the review, the following summarises what may work best for an EBP education intervention:

What: A multi-modal, multi-component, integrated EBP programme within health professional curricula.

Why: To develop and sustain EBP competencies including EBP knowledge, skills and attitude, for the improvement of service provision and patient outcomes.

How: To address all 5 EBP steps, with emphasis on the translation of EBP approaches into clinical practice (*Apply*).

Where: HEIs/ professional training bodies/centres and HSP / clinical workplace settings.

What is not clear: The optimal andragogic model of EBP education to follow, as well as the optimal breakdown (in terms of content and time allocation) of EBP components to be included within curricula.

Within a search of 'grey' literature, the Lancet Commission emphasise the importance of knowledge, skills and attitudes acquired through applying the principles of EBP. The report, 'Education of Health Professionals for the 21st century', highlights the need for healthcare professional training to be transformative. Transformative learning aligns well with the 5 steps of EBP, in particular the shift from memorisation of facts to critical reasoning, which guides the capacity to search analyse, assess and synthesize information to aid decision making (Frenk *et al.*, 2010). Internationally, EBP is a fundamental requirement by professional regulators and can be found in their educational standards, professional frameworks or codes of conduct.

Phase 2 – EBP International Expert Interviews

Expert interviews were conducted to ascertain current and nuanced information on EBP education for healthcare professionals in other English-speaking countries. Experts from the UK, Canada, New Zealand and Australia were chosen based on their contribution to peer-reviewed literature on the subject area, monitoring role in EBP education and through personal networking contacts from the NCEC and project team. Over a two-month period (March and April 2017), individual 'Skype' / telephone interviews were conducted and recorded. An interview schedule structured around the current practice and provision of EBP healthcare professional education with specific attention given to EBP curricula, core EBP competencies, teaching initiatives and key challenges to EBP education was

used. Qualitative content analysis techniques were applied to categorise data. Steps to ensure trustworthiness of the research process and data analysis were undertaken.

Five EBP experts participated in the interviews. All experts waived their right to anonymity.

EBP Expert Profile

EBP Expert	Title	Affiliation	Country
Professor Leanne Togher	Professor of Communication Disorders following Traumatic Brain Injury	Faculty of Health Sciences University of Sydney	Australia
Professor Gordon Guyatt	Distinguished Professor	Department of Health Research Methods, Evidence, and Impact McMaster University	Canada
Professor Rodney Jackson	Professor of Epidemiology	School of Population Health, Faculty of Medical and Health Sciences University of Auckland	New Zealand
Professor Bruce Arroll	Professor of General Practice	General practice and Primary Healthcare Faculty of Medical and Health Sciences University of Auckland	New Zealand
Professor Carl Heneghan	Professor of Evidence-Based Medicine and Director, Centre for Evidence-Based Medicine	Department of Primary Care Health Sciences University of Oxford	United Kingdom

The interview findings brought attention to the significance of three key categories, namely; (i) 'EBP Curriculum Considerations'; (ii) 'Teaching EBP' and (iii) 'Stakeholder Engagement in EBP Education'. Definitive advice in relation to curriculum considerations was provided with a clear emphasis on the need for EBP principles to be integrated throughout all elements of healthcare professional curricula. Embedding EBP within compulsory profession-specific competencies and/or accreditation processes can present opportunities for real integration of EBP, which should be reflected equally in both

academic and clinical elements of curricula. EBP competencies should centre on the oft-cited steps of asking questions, acquiring, appraising, assessing and applying evidence to patient care decisions. Additional attention to professionals ability to communicate evidence effectively and participate in shared decision-making is required.

The quality of teaching has potential to impact the uptake of EBP in practice. Adoption of effective strategies and practical methods to realise successful student learning and understanding is required. Of particular note was the grounding of teaching strategy and associated methods from a clinically relevant perspective with student exposure to EBP facilitated in such a way that it is dynamic and interesting. EBP role models and clinicians with the 'X-factor' were emphasized as being integral to demonstrating the application of EBP in clinical decision-making and facilitating the contextualisation of EBP within a specific setting/organisation. The provision of training for educators, the purpose of which is to aid the further development of skills and use of resources necessary for effective EBP teaching was recommended.

Engagement of national policy makers, healthcare professionals and patients with EBP also has potential to advance its teaching and application in clinical care. Establishing a coherent national policy on EBP education, investment in resources and related initiatives were deemed of merit to advance the EBP agenda. Providing structured and embedded EBP activities relevant to clinical care was recommended to improve healthcare professional consistency with EBP. Enabling patients to engage with evidence with a view to informing healthcare professional/patient interactions and care decisions was also advocated.

The implementation of successful EBP education serves the function of developing practitioners who value EBP and have the knowledge and skills to implement such practice. The ultimate goal of this agenda is to enhance the delivery of healthcare for improved patient outcomes. The overarching theme derived from the analysis from these interviews, 'Improving healthcare through enhanced teaching and application of EBP', represents the focus and purpose of the effort required to optimally structure HCP curricula, promote effective EBP teaching and learning strategies and engage with key stakeholders for the overall advancement of EBP education.

Discussion of Structured Review and Expert Interview Findings

The evidence derived from the desk-top review and expert interviews offer some consistent trends in EBP education which are discussed under the following headings: 1. Core Curriculum and Competency Framework for EBP Education 2. EBP Programmes - Content, Delivery Mode, Teaching Methods and Assessment and 3. Overcoming Barriers to EBP Teaching.

a. Curriculum Considerations and Competency Framework for EBP Education

Education programmes and associated curricula act as a key medium for shaping healthcare student professional knowledge, skills and attitude, and therefore play an essential role in determining the quality of care provided (Young *et al.*, 2014). With respect to professional curricula, educational theory advocates increased integration of theory and practice with respect to EBP (Aglen *et al.*, 2016). Unequivocal recommendations were made by EBP experts to integrate and embed EBP throughout academic and clinical curricula. Such integration is facilitated by the explicit inclusion of EBP as a core competency within professional standards and requirements (Frenk *et al.*, 2010) in addition to accreditation processes. From a curriculum development perspective, direction in relation to such integration is gained from looking to appropriate learning theory to underpin andragogic interventions. The empirical literature reviewed recommend that EBP curricula and teaching needs to be more closely aligned with educational theories that support 'real-time' integration of education with clinical practice. Adult learning theory, behaviour change theory and, from an undergraduate perspective, theories of cognitive maturity development and knowledge transfer, can assist in structuring curricula overall to facilitate the integration of EBP as a core component (Aglen 2016; Dizon 2012; Harris *et al.*, 2011). An additional suggestion derived from expert consultations is the development of learning objectives at novice, intermediate and entry levels to professional undergraduate programmes. While such a recommendation can only be tentative in nature given the extent of evidence available, empirical review findings also provisionally advocate a 'spiral approach', whereby EBP concepts and application increase in complexity and are reinforced throughout the years of learning (Elcin *et al.*, 2014; Iliac and Maloney 2014).

From the empirical review, it is clear that the minimum standard educational requirements and core learning outcomes derive from the 5-step model of EBP as originally proposed by Guyatt *et al.*, (1992) and further explicated within the Sicily Statement by Dawes *et al.*, in 2005. These steps form the basis and are included in the majority of professional competency frameworks (Galbraith *et al.*, 2017). It is also clear that in the majority of cases, only some components of the model, namely the first three steps of Ask, Acquire, and Appraise are included in terms of EBP teaching assessment and research

outcomes. Recommendations from expert consultation, while acknowledging the need for fundamental knowledge and skills in these 3 areas, highlight the need for a more effective and targeted approach to the teaching and assessment of steps 4 (Application of evidence in practice) and 5 (Assessment of outcomes from clinical EBP decision-making). Integrative interactive teaching and further development of and emphasis on communication skills are key to enhancing competency in these areas and particularly in relation to realising shared decision-making between patients and healthcare practitioners in making evidence-based decisions.

Findings from a recent systematic review by Galbraith *et al.*, (2017), which examined a ‘real-world’ approach to evidence-based medicine in general practice, corroborates this recommendation by calling for further attention to be given to communication skills of healthcare practitioners within the context of being an evidence based practitioner. The use of pre-processed and pre-appraised evidence sources was another key issue raised by EBP experts and increasingly more recently within empirical literature (Robeson and Dobbins 2010; Yost *et al.*, 2014). While again it is recognised that search and appraisal skills should be a fundamental element of healthcare curriculum and an essential skill, critical adeptness and competency in the navigation of pre-sourced and pre-appraised evidence sources is also required.

A healthcare professional curriculum which explicitly and consciously integrates EBP as a core professional competency throughout all academic and clinical curriculum domains is recommended. While the 5-step EBP model remains the foundation for building EBP skills and knowledge and therefore informs the majority of professional competency frameworks, a more pragmatic approach to steps 1-3 is required in terms of acquiring and appraising evidence, with a more targeted approach needed to improve competency and outcomes in relation to steps 4 and 5. Use of educational theories that support the practical integration of theory with practice is recommended to facilitate this process (Flores and Matteos 2007; Dizon *et al.*, 2012; Aglen *et al.*, 2016).

b. EBP Programmes - Delivery Mode, Duration, Teaching Methods and Assessment

Similar to previous review findings on EBP healthcare professional education (Dizon *et al.*, 2012; Iliac *et al.*, 2014; Ahmadi *et al.*, 2015), participation in any structured form of EBP education regardless of whether it is taught at an undergraduate or postgraduate level, can have beneficial effects on EBP competencies in terms of knowledge, skills and attitudes. Evidence for the impact of EBP education on actual behaviour or clinical outcomes is more tentative (Dizon *et al.*, 2012; Young *et al.*, 2014; Ahmadi *et al.*, 2015). However, considering the multitude of factors impacting on practice outcomes, it is difficult to design robust studies which can assess and attribute improved health outcomes to any single

factor (Cook et al., 2013). Progress in terms of 'prescribing' effective EBP education components, such as optimal duration of training, delivery modes and assessment strategies is hampered by the variable quality of research methods used to evaluate the effectiveness of EBP education interventions. While the evidence overall is not definitive, experts in EBP, together with trends throughout empirical research and recognised educational theory repeatedly make a number of recommendations for enhancing EBP programmes and associated teaching and learning strategies. These include; (1) clinical integration of EBP teaching and learning; (2) a conscious effort on behalf of educators to embed EBP throughout all elements of healthcare professional programmes; and (3) the use of multi-faceted, dynamic teaching and assessment strategies which are context-specific and relevant to the individual learner / professional cohort.

What do these recommendations mean at a practical level for policy-makers and educators charged with programme development? It requires a more concerted effort to move away from a predominant reliance on stand-alone didactic teaching towards clinically integrative and interactive teaching. In 2006, Khan and Coomarasany developed a hierarchy of effective educational strategies for EBP teaching based on empirical and theoretical evidence. Level 1, deemed the most effective strategies, represent interactive and clinically integrated teaching and learning activities. An example provided by one of the EBP experts represents this level in terms of the performance of GATE CATS while on clinical rotation with assessment conducted by a clinician in practice. Such an activity fulfils the criteria of being reflective of practice, facilitating the identification of gaps between current and desired levels of competence, identifying solutions for clinical issues and allowing re-evaluation and opportunity for reflection of decisions made with a practitioner. Such interactivity facilitates 'deeper' learning, which is essential for knowledge transfer (Aglen *et al.*, 2016). This strategy level is of particular importance for providing enhanced learning opportunities to achieve competency in steps 4 and 5, which, as the review findings demonstrated are least addressed within EBP programmes.

At level 2, interactive, classroom-based teaching, or didactic, but clinically integrated teaching is recommended. Although classroom-based, a conscious effort is required to ensure teaching sessions are interactive, e.g. through the use of group work with defined outcomes or case discussions (Khan and Coomarasamy, 2006). From analysis of expert interviews, using clinical examples, simulation of clinical scenarios to replicate 'bedside' teaching, providing resources where students have to work through 'real-life' examples were repeatedly recommended as essential to demonstrating the relevance and application of EBP.

Level 3 encompasses traditional teaching activities, which are predominantly didactic in nature and presented as 'stand-alone' modules within a programme. The lack of activity or interactivity, in addition to the absence of a clinical context is suggested to limit students' interest and depth of learning both of which are required to effectively acquire competence in EBP skills (Khan and Coomarasamy, 2006; Ilic *et al.*, 2014).

The findings and propositions by Khan and Coomarasamy (2006) are reflected and corroborated in empirical work in the past decade which advocate for the implementation of multifaceted, clinically integrated approaches with relevant assessment (Ilic *et al.*, 2014; Kortekaas *et al.*, 2016; Ubbink *et al.*, 2013; Young *et al.*, 2014;).

Findings from EBP expert consultations recommend that EBP needs to be 'pervasive' throughout all elements of programme content with EBP teaching and learning not just within the remit of stand-alone EBP specific-modules. This recommendation presents challenges in terms of measuring or prescribing optimal 'duration' or allocation of time for EBP teaching if we are to move away from a 'stand-alone' module approach to EBP teaching. Rather than focus on time allocation, further attention should be concentrated on specifying sound and measurable EBP learning objectives that address all 5 steps of the EBP model throughout a programme. A comparable emphasis is also needed on the development of assessment strategies that can accurately assess EBP knowledge and skill attainment. Demonstrating EBP competence is a complex task, therefore no single assessment method can provide all the necessary data to assess complete EBP competence (Ilic *et al.*, 2009; Blanco *et al.*, 2014). Expanding assessments methods to include the use of an adapted and profession-specific Fresno test, OSCEs or simulation exercises and clinical CATS, would be of benefit in more comprehensively assessing different aspects of EBP competence and also useful for monitoring the vertical and horizontal integration of EBP throughout a programme. The Sicily Statement on the classification and development of evidence based practice learning assessment tools is an international consensus statement which offers direction for educators and researchers in developing and identifying the types of EBP learning assessment tools that are needed to promote more consistent evaluation of EBP teaching outcomes (Tilson *et al.*, 2011).

Where not already present, there is an immediate requirement for healthcare professional education providers and regulators to explicitly include EBP as a core professional competency, which is embedded throughout all aspects of undergraduate and postgraduate programmes. Operationalisation of this can be facilitated through the use of multi-faceted, interactive and clinically integrative teaching

and learning strategies and assessments to effectively assist students in achieving EBP competency across all elements of the 5-step model.

c. Strategies to overcome barriers to the implementation of EBP teaching

While there is no 'magic bullet' that can readily address all factors impacting upon EBP education and its implementation in practice, identifying and overcoming potential barriers is recommended as effecting positive change (Baker 2010). In addition to addressing challenges such as curriculum organisation and programme content/structure, the following strategies were also highlighted within the review and expert interviews findings;

- (1) 'Training the trainers'.
- (2) Development of and investment in a national coherent approach to EBP education.
- (3) Structural incorporation of EBP learning into workplace settings.

Comparable national surveys by Meats *et al.*, (2009) and Blanco *et al.*, (2014) found that a lack of academic and clinical staff knowledgeable in teaching EBP was a barrier to effective and efficient student learning. This was echoed by findings from EBP expert interviews. Effective teacher education is required to improve EBP teaching quality (Ingvarson and Rowe 2007; Walczak *et al.*, 2010; Ubbink *et al.*, 2013; Young *et al.*, 2014,). Providing educators with formal training in teaching EBP can assist in identifying learning opportunities and accessing relevant resources in a variety of contexts and settings (Walczak *et al.*, 2010). Of note, such formal training should extend to academic and clinical educators equally. EBP role models and champions, through participation in such training, presents an opportunity for the promotion of 'best practice' in EBP teaching throughout academic and clinical educational settings. Initiatives such as the EU-EBM project (Thangarantinam *et al.*, 2010), in addition to EBP teaching workshop programmes held at Oxford (CEBM) and McMaster Universities recognise the necessity and value of such education for the advancement of the EBP agenda.

A national and coherent plan with associated investment in healthcare education specific to the integration of EBP was highlighted within the expert interviews as having an important impact on educational outcomes. The lack of a coordinated and cohesive approach and perceived value of EBP in the midst of competing interests, particularly within the context of the healthcare agenda, was suggested to lead to an 'ad-hoc' approach to the implementation of and investment in EBP education and related resources. Findings from a systematic scoping review of recommendations for the implementation of evidence-based practice by Ubbink *et al.*, (2014), draw attention to a number of interventions at a national level that have potential to further promote and facilitate EBP education.

Such interventions include government level policy direction in relation to EBP education requirements across health profession programmes and the instalment and financing of a national institute for the development of evidence-based guidelines. A similar proposal by Togher *et al.*, (2011) was made as a result of the findings from a national scoping study on EBP education amongst Speech Pathologists in Australia which strongly recommended a national plan of action for EBP curricula and resources.

Structural incorporation¹ of EBP learning and its implementation in practice has potential to counter the barriers cited within this review that were associated with a lack of personal discipline in relation to participating and implementing evidence based practice in addition to facilitating the principles advocated by EBP experts with regard to making EBP learning accessible, simple, and relevant. Such structural incorporation can be facilitated at various different levels and settings. At a health service level, the provision of computer and internet facilities at the point of care with associated evidence based decision support systems allowing access to guidelines, protocols, critically appraised topics and condensed recommendations was recommended. At a local workplace level, access to EBP mentors, implementation of consistent and regular journal clubs, grand rounds, audit, and regular research meetings were all emphasized as important to embed within the healthcare or education environment. This in turn can nurture a culture which practically supports the actualization of EBP in day to day practice (Ubbink *et al.*, 2013).

Phase 3 – National EBP Teaching Survey

To capture and describe baseline data relating to the current provision and practice of EBP education to healthcare professionals at third level institutions and professional bodies in Ireland, a descriptive, cross-sectional survey was undertaken.

The sampling frame was derived from the project scope which specified the following training establishments in Ireland:

- Higher Education Institutions (HEIs) that provide undergraduate and postgraduate training to doctors, nurses/midwives and allied health professionals in Ireland (ROI).
- Postgraduate training bodies e.g. Irish postgraduate medical training bodies (which meet the Medical Council postgraduate accreditation standards) and the Centres for Nursing and Midwifery Education (for courses approved by the NMBI).

¹ Structural Incorporation: Promotion and facilitation of EBP activities in daily practice, e.g. audit, pre-appraised evidence availability, accessing EBP resources at point of care.

A purposive and targeted strategy was employed to ensure that key stakeholders involved in the provision, oversight or regulation of healthcare professional education were therefore sampled. Specifically, all Higher Education Institutes, (*Universities (n=6 UCC, UCD, DCU, TCD, UL, NUIG (including St. Angela's College)*), National University of Ireland Recognised Colleges (*n=1 RCSI*), and Institutes of Technology (*n=7 AIT, WIT, DKIT, GMIT, Letterkenny IT, DIT, ITT*) that offer undergraduate and postgraduate healthcare profession education courses (medicine, nursing, midwifery, dentistry, surgery, dietetics, pharmacy, physiotherapy, occupational therapy, speech and language therapy, podiatry, clinical psychology, optometry and radiography) were sampled. Professional training bodies and associated accredited training programmes were also targeted (*Irish Postgraduate Medical Training Body (RCPI), Irish Postgraduate Surgical Training Body (RSCI), Irish Medical Council (IMC), Irish College of General Practitioners (ICGP), Centres for Nursing and Midwifery Education, The Pharmaceutical Society of Ireland (PSI), Irish Institute of Pharmacy (IIOP), Pharmacy Society of Ireland (PSI), Irish Pharmacy Union Academy, Irish Society of Chartered Physiotherapists (ISCP), Irish Association for Speech and Language Therapists, The Association of Occupational Therapists of Ireland (AOTI), the Irish Institution of Radiography and Radiation Therapy (IIRRT), Dental Council of Ireland, Irish Dental Association, Primary Dental Care and CORU*). While not feasible to sample all postgraduate training bodies, the project aimed to recruit a representative sample (See Appendix A for a list of invitees).

The survey was developed following: (1) a review of literature specifically examining national third level EBP teaching to healthcare professionals and; (2) consultation with the NCEC, DoH. Items from surveys developed by Meats *et al.*, (2009) (*UK Undergraduate Medical Schools*), Togher *et al.*, (2011) (*Australian Undergraduate and Postgraduate Speech and Language Therapy Schools/Department*), and Blanco *et al.*, (2014) (*Canadian and US Medical Schools*) were of particular utility in informing the design of the current survey. The survey incorporated Dawes *et al.*, (2005) Sicily Statement on: (1) the definition of EBP; (2) the teaching of EBP and; (3) the EBP process i.e. '5-step' model. The survey consisted of 4 sections with a total of 37 closed and open-ended questions.

Section 1 contained items relating to background information, specifically:

- (a) Type and size (in terms of student numbers) of School/Department/Training Body.
- (b) Academic level of student programmes/courses offered (Undergraduate/Postgraduate/CPD).
- (c) Staff involved in the formal teaching of EBP/clinical audit.
- (d) Principal teaching approach / methods used to deliver EBP/clinical audit education.
- (e) Evidence of a dedicated EBP/clinical audit champion/lead.

Section 2 comprised of items relating to EBP teaching and curriculum considerations, including:

- (a) Processes associated with the development, review and evaluation of curricula (e.g. contributors (academic and clinical), alignment to professional body core competency requirements, explicit EBP philosophy).
- (b) Curriculum content (e.g. specific EBP learning outcomes according to the Sicily Statement, access to EBP resources).
- (c) Type of EBP formative and summative assessments (including assessment of application in clinical settings).
- (d) Evidence of educational activities in specific areas of clinical effectiveness (e.g. Quality improvement processes, patient safety, implementation science).

Section 3 gathered information in relation to:

- (a) Staff attitudes towards EBP.
- (b) Formal training (type and duration) received by staff in teaching EBP.
- (c) Knowledge of and access to EBP resources (e.g. electronic online tools and databases).

Section 4 contained items in relation to barriers and facilitators to teaching EBP. Two open-ended questions requesting details of innovative examples of how EBP was/is taught by respondents and recommendations on the type of resources that could be provided/developed to enhance EBP teaching were also included. At the end of the questionnaire, participants were asked to provide a copy or an overview of their EBP curriculum to outline further detailed description and examples of current/best practice. Extensive pre-testing and piloting was conducted to ensure content validity, clarity of the survey items, and reliability of the data collection mode. The Questionnaire Appraisal System (QAS 99) (Willis and Lessler 1999), a tool used to aid systematic analysis of questionnaires prior to use in the field, was adopted for pre-testing the survey. Following the required revisions, the survey was migrated to an electronic format using SurveyMonkey ©.

Higher Education Institutes and professional training bodies were contacted by email through the Dean (or equivalent e.g. Head of Education and Professional Development) of the respective Department/School/Centre/Training body. Each e-mail contained a cover letter detailing the project purpose and methods. If agreeable to participating in the study, each contact was asked to provide details of a nominated person representing both undergraduate and/or postgraduate programmes within their department for the research team to liaise with. They were also provided with the option of directly forwarding the e-mail, including the cover letter and a study-specific, secure and de-identified link to the web-based survey, to the identified member(s) of staff. Over the 6-week data

collection period (April –May 2017), three reminder e-mails were sent. Data were analysed both quantitatively and qualitatively. Descriptive statistics were used to describe the responses to the study. Qualitative analyses involved thematic groupings of open-ended survey responses.

Representation from 11 health and social care professions (dentistry, occupational therapy, nursing, midwifery, pharmacy, physiotherapy, radiography, dietetics, psychology, medicine and speech and language therapy) across undergraduate, postgraduate and continuing professional development academic levels was obtained and underscores the scope of responses received. The findings indicated that for the majority of respondents, formal teaching of EBP was introduced within their respective institutions more than 10 years previously and is predominantly taught by academic staff. ‘Blended learning’, that is a combination of traditional and problem based learning, is the principal teaching approach used to deliver healthcare curricula overall, of which EBP is a component. ‘Stand-alone’ didactic lectures are the most frequently used method of teaching EBP across all academic programme levels, with non-face-to-face methods and practice based learning workshops allocated the least amount of teaching time. A named EBP Lead/Champion is not identifiable within the majority of institutions.

In relation to curriculum issues specific to EBP teaching and learning, overall, there was strong agreement that EBP principles are embedded within curricula to achieve core professional competencies, with undergraduate and postgraduate written curricula reflecting an EBP philosophy. There was also strong agreement that academic staff decide which subjects are appropriate for teaching EBP with a lower proportion of respondents agreeing that clinical educators have such an input. Evaluation of undergraduate and postgraduate programmes to ensure the inclusion of EBP principles is conducted in the majority of cases. However, over one third of respondents were unsure if such evaluative processes were implemented.

The findings indicate that all EBP learning activities as outlined by the Sicily Statement (Dawes *et al.*, 2005) (ask, acquire, appraise, apply and assess) are included as key content areas across healthcare profession programmes with activities in relation to the retrieval, accessing and appraisal of evidence classified as the most common activities. While over 75% of respondents indicated strong agreement that formative and summative assessments are used by academic staff to determine the extent of EBP learning, agreement on the use of such assessment strategies by clinical educators was considerably less. The most common methods used to assess EBP learning include Critically Appraised Topics (CATS) and Observed Structured Clinical Examinations (OSCEs). The assessment method least used is the

application of CATs within a clinical setting. With regard to current teaching practices in the area of clinical effectiveness, findings indicate that patient safety and quality improvement processes are the subjects most frequently taught.

Education on clinical audit was provided by the majority of represented institutions and across all academic programme levels, although notably less so at a continuing professional development level. Methods of teaching include small group tutorials, integration of audit material into other lecture topics and the application of audit methods into practice settings. Just under half of respondents indicated that learning outcomes in relation to clinical audit were assessed.

Overall, attitudes towards EBP were very positive with the vast majority acknowledging EBP as necessary for improved clinical decision-making and quality of patient/client care. Just over half of respondents indicated that staff have received formal training in teaching EBP namely through attendance at EBP teaching workshops or in-service training sessions. Informal activities undertaken to assist in teaching EBP ranged from drawing on personal professional experiences of being an evidence-based practitioner to self-directed learning in relation to accessing and appraising information.

The top three rated barriers to EBP teaching included difficulties integrating evidence into practice, the lack of time for EBP within curricula and the lack of importance or the perceived relevance by students of EBP education provision. Access to courses to enhance knowledge of EBP/teaching of EBP, in addition to evidence of improved patient outcomes from the use of EBP are seen as potentially helpful strategies to enhance EBP teaching.

While only one HEI and two professional regulatory bodies provided further EBP relevant materials, examples of innovative teaching practices and recommendations for the future development of EBP education were made. Of note, the seamless integration of EBP throughout all aspects of professional curriculum was emphasized. It was suggested that EBP should not be perceived as a discipline or 'subject' in its own right but rather embedded within education programmes.

Conclusions & Key Observations

This body of work is the first of its kind to investigate the teaching of EBP to healthcare students and professionals across a multitude of healthcare disciplines in Ireland using a national survey. Similar to other national EBP teaching surveys in the UK, USA and Australia (Blanco *et al.*, 2014, Meats *et al.*, 2009, Togher *et al.*, 2011), the attitude to the teaching of EBP in Ireland is positive and a considerable level of

EBP activity in University curricula and CPD programmes is evident. Furthermore, publications by regulatory bodies of healthcare disciplines in Ireland highlight a strong commitment to the need for engagement with EBP principles to advance healthcare disciplines and improve patient care/ healthcare service provision. In keeping with international findings from the rapid review, the first three steps of EBP (i.e. Ask, Acquire, Appraise) are taught most frequently in Ireland across disciplines, both at academic level (UG/PG/CPD) and in workplace settings, while steps four and five (i.e. Apply, Assess) appear to be taught less frequently. Findings from the national survey indicate that Clinical Audit appears to be taught as a stand-alone component and not usually integrated into the EBP steps, despite its implicit inclusion in the 5 EBP steps (Dawes *et al.*, 2005). Similarly, Implementation Science also seemed to be predominantly taught as a stand-alone component. There is considerable overlap between the EBP steps (particularly 4 and 5), Clinical Audit and Implementation Science. Further explicit inclusion of these areas within the EBP steps is warranted, with Implementation Science within the domain of 'Apply' and Clinical Audit within the domain of 'Assess'. In general, a reported lack of engagement in steps 4 and 5 (Apply and Assess) also evident throughout previous survey findings, is suggested to reflect curriculum time constraints, a lack of teaching methods, or the assumption that it occurs automatically (McDonald *et al.*, 2014). Without participation in this step, students are unlikely to learn how to review and refine EBP processes, making knowledge transfer to practice challenging. This should be addressed for future enhancement of EBP teaching in Ireland and internationally. Future EBP developments as outlined by respondents in the national survey suggest that seamless integration of EBP throughout all aspects of the academic curricula is embedded as a core component and not a standalone "subject". Helpful strategies suggested for enhancing EBP teaching and learning included staff development (both within academic and clinical settings), and a multi-disciplinary approach and access to core resources for EBP teaching across health professions. These strategies are echoed within international EBP teaching survey study recommendations (Blanco *et al.*, 2014; Meats *et al.*, 2009; McDonald *et al.*, 2014; Togher *et al.*, 2011). Supporting staff to have confidence and competence in teaching EBP and providing opportunities for 'real' learning throughout education programmes is necessary to facilitate tangible change in this area. Designated core EBP resources and a 'whole college' or multi-disciplinary approach to EBP education more accurately reflects the interdisciplinary nature of evidence-based health care which remains a fundamental premise of patient/client care delivery.

To achieve 'best practice' in national clinical effectiveness and evidence-based practice health professional education in Ireland, the following key observations are formed on the basis of the salient findings from the structured review, expert interview and national survey.

Healthcare Profession Education Domain	Key Observations to Inform Recommendations	For reflection and action by key stakeholders
Curricula (undergraduate/postgraduate)	<ol style="list-style-type: none"> <li data-bbox="454 331 991 611">1. Explicit and consistent inclusion, documentation and demonstration of EBP principles and processes² throughout academic and clinical programme components is advocated to focus curricula development and associated learning activities. <li data-bbox="454 651 991 931">2. Educational theories, for example, adult learning theory and theories of cognitive maturity development and knowledge transfer, offer guidance in structuring curricula, with a particular utility in facilitating the integration of EBP as a core curriculum component. <li data-bbox="454 972 991 1285">3. Where not already present, explicit inclusion of EBP as a core competency within professional standards and requirements, with consideration given to linking with professional accreditation processes is recommended to facilitate improved integration of EBP within academic and clinical curricula. <li data-bbox="454 1326 991 1505">4. The application of mapping tools to health education curricula is valuable to ensure the vertical and horizontal integration of EBP throughout all programme elements. <li data-bbox="454 1545 991 1859">5. Scaffolding acquisition of EBP learning outcomes across novice, intermediate and professional entry levels within undergraduate programmes has gained increased attention as a potentially effective method of structuring learning and application of EBP throughout the duration of a programme of study. 	<p data-bbox="1013 331 1414 499">Academic and clinical educators³ within Higher Education Institutes (HEIs), Health Service Providers (HSPs) and professional training bodies.</p> <p data-bbox="1013 651 1414 752">Academic and clinical educators within HEIs, HSPs and professional training bodies.</p> <p data-bbox="1013 994 1414 1061">Professional Regulator & Training Bodies</p> <p data-bbox="1013 1352 1414 1453">Academic and clinical educators within HEIs, HSPs and professional training bodies</p> <p data-bbox="1013 1570 1414 1671">Academic and clinical educators within HEIs, HSPs and professional training bodies</p>

² EBP Principles and Process: As defined by the Sicily statement (Dawes et al., 2005).

³ Clinical Educators: Teachers/Trainers/Role Models of EBP in health sector but not in University/Academic settings.

	6. National agreement among key stakeholders of the minimum standard educational requirements and core EBP learning objectives is advocated with consideration given to international models i.e. Sicily Statement/Oxford/McMaster in the development of such requirements.	NCEC, Professional Regulatory & Training Bodies, HEIs/HSPs and other stakeholders.
EBP Competencies/ Additional Skills	7. Increased emphasis is needed on developing competency in, and providing access to, pre-appraised evidence resources to facilitate a more 'real-world' and pragmatic approach to the acquisition and appraisal of evidence to inform practice (see also Key Observation No. 15). 8. Additional opportunities for students and practitioners to engage in the application of EBP and the assessment of its impact in practice through audit and associated activities is advised. 9. Further emphasis on skills relating to communication of evidence and shared decision-making processes with patients/clients is increasingly recognised as key to EBP competency.	Academic and clinical educators, in addition to library providers and information specialists within HEIs and HSPs. Academic and clinical educators within HEIs and HSPs. Academic and clinical educators within HEIs and HSPs.
Teaching and Learning Approach	10. An interdisciplinary teaching approach to the delivery of core common components of EBP education across undergraduate and postgraduate programmes is suggested as a helpful strategy for enhancing EBP teaching and learning. 11. Employment of effective teaching strategies which are clinically integrative, interactive and multi-modal in terms of delivery are considered essential for enhanced EBP competence and knowledge transfer.	Academic and clinical educators within HEIs, HSPs and professional training bodies. Academic and clinical educators within HEIs, HSPs and professional training bodies.

	<p>12. The use of a <i>wide range</i> of validated assessment strategies (where possible, e.g. Fresno Test, Berlin Questionnaire, GATECAT, OSCE), that can accurately assess EBP competency attainment is advised to promote a consistent evaluation of EBP teaching outcomes.</p>	<p>Academic and clinical educators within HEIs, HSPs and professional training bodies.</p>
<p>Strategies for Overcoming Teaching and Learning Barriers</p>	<p>13. Engagement with stakeholders to agree and direct the delivery and integration of EBP education across undergraduate, postgraduate and continuing professional programmes is advised to advance the EBP agenda in a co-ordinated and cohesive manner.</p> <p>14. Achieving 'best practice' in EBP teaching - EBP educators charged with responsibility for health professional education (university/academic staff, regulatory body education officers and practice/health service clinical educators) should have formal training in EBP and EBP teaching across all steps of EBP (ask, acquire, appraise, apply, assess) and be facilitated to undertake such training.</p> <p>15. The incorporation and promotion of EBP activities and resources e.g. journal clubs, grand rounds, audit, access to clinical librarians/information specialists and EBP literature within clinical/health service settings is advocated to facilitate enhanced engagement with evidence based practices.</p> <p>16. Increased discourse between academic and clinical educators through curriculum development and evaluation processes presents an effective opportunity to enable further integration of EBP teaching into practice.</p>	<p>NCEC, Academic and clinical educators within HEIs & HSPs Professional Regulatory and Training Bodies</p> <p>Academic and clinical educators within HEIs, HSPs, and professional training bodies.</p> <p>Health Service Providers</p> <p>Academic and clinical educators within HEIs, HSPs and professional body educators.</p>

Research (Overall Observation)	17. Research and funding agencies (national & international) to consider allocation of grants to develop and support this area of capacity building specifically in relation to researching teaching & learning of EBP	Academic and clinical educators within HEIs, HSPs and professional body educators and other key stakeholders.
Research Recommendations (International)	18. Develop and evaluate a common core programme of study using standardised outcome measures across healthcare professions in relation to the achievement of EBP competency.	
	19. Investigate the efficacy of implementing specific andragogic learning strategies to direct health profession curricula in relation to the integration of EBP.	
	20. Evaluate, through longitudinal studies, the impact of current health professional education on developing EBP skills and knowledge in addition to changing and sustaining practice behaviour.	
	21. EBP educators should be encouraged to form collaborations with educational researchers in order to design and develop rigorous studies to successfully compete for research funds and increase the evidence base for EBP teaching and practice.	
Research Recommendations (National)	22. Conduct a follow-up national survey following the implementation of overall recommendations/key observations to allow for comparison with repeat data.	
	23. Conduct a baseline study examining communication and collaboration practices between academic/HEI, clinical (HSP) and professional body educators in relation to EBP education, particularly its integration and assessment in clinical settings.	

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Appendix A: List of Survey Invitees

Dentistry		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
UCC	UG	B.Dent.SC
UCC	UG	Dip. Dent. Nursing
UCC	UG	Dip. Dent. Hygiene
UCC	PG	PhD in Clinical Dentistry
UCC	PG	MSc in Dent. Publ Health
TCD	UG	B.Dent.SC
TCD	UG	Dip. Dent. Nursing
TCD	UG	Dip.Dent Hygiene
TCD	PG	P.Grad Dip (Clinical dental technology)
TCD	PG	Conscious Sedation in Dentistry
TCD	PG	Dental Surgery (D.CH.Dent)
TCD	PG	Special Care Dentistry
TCD	PG	Clinical Doctorate in Orthodontics
	CPD	Dental Council of Ireland
	CPD	Irish Faculty of Primary Dental Care
	CPD	Irish Dental Association
	CPD	Faculty of Dentistry, RCSI

Occupational Therapy		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
UCC	UG	BSc OT
TCD	UG	BSc OT
NUIG	UG	BSc OT
UL	PG	MSc in OT
	CPD	Association of OT in Ireland

Nursing		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
RCSI	UG PG	Nursing
UL	UG	BSc General Nursing
UL	UG	BSc Nursing ID
UL	UG	BSc Mental Health
UL	PG	MSc General Nursing
UL	UG	BSc Midwifery
UL	PG	Higher Dip in Midwifery
TCD	UG PG	Nursing
TCD	UG	BSc in General nursing
TCD	UG	BSc In Intellectual Disability Nursing
TCD	UG	BSc Midwifery
UCC	UG & PG	BSc General Nursing PG Diplomas / Masters
WIT	UG	BSc General Nursing
WIT	UG	BSc Nursing
WIT	UG	BSc ID Nursing
WIT	UG	BSc Psychiatric Nursing
WIT	PG	MSc/Grad Dip nursing
ITT	UG	BSc in General nursing
UCD	UG	Nursing Studies
NUIG	UG	Nursing Studies
DCU	UG PG	Nursing Studies
DCU	UG	BSc Mental Health Nursing
DCU	UG	ID Nursing
AIT	UG	BSc Nursing
GMIT	UG	BSc Nursing studies
DKIT	UG	BSc Nursing Studies
	CPD	Centres for Nurse/Midwifery Education (23)

Pharmacy		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
UCC	UG	Mpharm
TCD	UG	Mpharm
RCSI	UG	Mpharm
UCC	UG	MSc Clinical Pharmacy
TCD	UG/PG	MSc in Hospital Pharmacy
TCD	PG	MSc/Dip/Cert in Community Pharmacy
	CPD	Irish Institute of Pharmacy
	CPD	Irish Pharmacy Union Academy
	CPD	Pharmaceutical Society of Ireland
RCSI		School of Pharmacy

Physiotherapy		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
RCSI	UG	BSc Physiotherapy
UL	UG	BSc Physiotherapy
UCD	UG	BSc Physiotherapy
TCD	UG	BSc Physiotherapy
UL	PG	MSc Physiotherapy
UL	PG	MSc Clinical Therapies
RCSI	PG	MSc in Neurology & Gerontology
UCD	PG	MSc Physiotherapy
UCD	PG	MSc Neuromusculoskeletal Physiotherapy
UCD	PG	MSc Musculoskeletal Physiotherapy
UCD	PG	MSc Sports Physiotherapy
UCD	PG	MSc Advanced Physiotherapy Practice
TCD	PG	Online Postgrad Cert in Clinical Exercise
		ISCP
		CORU

Radiation Therapy/Radiography		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
UCD	UG	BSc Diagnostic Radiography
TCD	UG	BSc Radiation Therapy
UCD	PG	MSc Diagnostic Radiography
	CPD	Irish Institute of Radiography and Radiation Therapy
	CPD	CORU

Podiatry		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
NUIG	UG	BSc Podiatry
NUIG	UG	Podiatric Medicine

Dietetics		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
DIT	UG/PG	BSc in Human Nutrition and Dietetics
UCD	UG	BSc in Human Nutrition and Dietetics

Psychology		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
UCC	PG	Doctor of Clinical Psychology
UCD	PG	Doctor of Clinical Psychology
NUIG	PG	Doctor of Clinical Psychology
TCD	PG	Doctor of Clinical Psychology
UL	PG	Doctor of Clinical Psychology

Speech & Language Therapy		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
TCD	UG	BSc in SALT
TCD	UG	BSc in SALT
TCD	UG	BSc in SALT
TCD	PG	MSc in SALT
UCC	UG	BSc in SALT
NUIG	UG	BSc in SALT
UL	PG	MSc in SALT

Optometry		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
DIT	UG	BSc. Optometry

Medicine		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
UCC	UG	MB, BCh, BAO
UCC	UG	BSc Paramedic Studies
NUIG	UG	MB, BCh, BAO
UL	PG	BM, BS (Grad entry)
UL	PG	BSc Paramedic Studies
UCD	UG	BMMB, BCh, BAO
TCD	UG	MB, BCh, BAO
RCSI	UG	MSc, Bch, BAO (grad entry)
UCC	PG	MRes in Health Professions Education
UCC	PG	MCh in Surgical Science
UCC	PG	MMedSc in Sports and Exercise Medicine
UCC	PG	MSc in Obstetrics & Gynaecology
NUIG	PG	MSc in Advanced Healthcare Practice & Research
NUIG	PG	MSc/Dip/Cert in Health Sciences (Clinical Education)
NUIG	PG	MSc in Medical Science
NUIG	PG	Medical & Healthcare Simulation Cert/Dip/MSc
NUIG	PG	Dip/Cert Health Sciences (Clinical Primary Care)
NUIG	PG	MSc Clinical Research
NUIG	PG	MA (Health Promotion)
TCD	PG	Master in Medicine
TCD	PG	MSc in Cardiology
RCSI	PG	Prof Dip in clinical Leadership
UCD	PG	Grad Dip in Dermatology
		Irish Network of Medical Educators (INMED)

Irish Postgraduate Medical Education Bodies		
H.E.I./Equivalent	UG/PG	Course/EBP Education Network
RCSI	PG	Core Surgical Training
RCSI	PG	Cardiothoracic speciality training
RCSI	PG	General Surgery Speciality Training
RCSI	PG	Neurosurgery Speciality Training
RCSI	PG	Oral & Maxfac Speciality Training
RCSI	PG	Otolaryngology Speciality Training
RCSI	PG	Paediatric Speciality Training
RCSI	PG	Plastic & Reconstruction
RCSI	PG	Trauma & Orthopaedic
RCSI	PG	Urology Speciality Training
RCSI	PG	Surgical Informatics/Vascular

Sampled Irish Postgraduate Medical Education Bodies		
H.E.I./Equivalent	UG/PG/CPD	Course/EBP Education Network
RCPI	CPD	Head of Education & Professional Development
		Director of Paediatrics
		Director of Obs & Gynae
		Director of Research
		Director of Professional Competence
		Director of Exams
		President Elect, RCPI
		Dean of Public Health
		Dean of Pathology
		Director of Training site Accreditation
		Assoc. Prof for specialist division of the register
		Director of Education and Prof Development
		Dean PG Specialist Training
		Dean of Occupational Medicine
		Director of Quality and critical care

Sampled Forum of Postgraduate Training Bodies
Irish College of General Practitioners
Irish College of Ophthalmologists
College of Psychiatrists
Royal College of Physicians
Royal College of Surgeons
Faculty of Dentistry, RSCI
Irish Committee for Higher Medical Training
Irish Surgical Postgraduate Training Committee