Evidence Base within Clinical Practice In Modern Medicine (A Clinicians Perspective)

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The aim of this work is to critically assess to what extent and in what ways evidence based practice may, or indeed may not, assist clinical practitioners to avoid confusing personal opinion with evidence. "We become confident in our educated guesswork to the point where it is easy to confuse personal opinion with evidence or personal ignorance with genuine scientific uncertainty" (Naylor 1995). The author of this work is a clinician currently practising in the area of acute and emergency and trauma healthcare, and therefore clinical treatments will be considered in the context of evidence based practice. This work has been formulated around an online postgraduate Master's module investigating the meaning of evidence based practice in the modern healthcare setting. Some of the content of this work will draw upon the learning objectives of the evidence based module by using examples of online forum discussions, which took place during the module between various clinical practitioners. It is a further expectation of this work to examine to what extent and in what ways evidence based practice assists clinicians in making research based clinical decisions, whilst considering how evidence is or indeed is not amalgamated into clinical practice. Evidence and the concepts used to cement evidence into practice will be explored both by considering the online forum discussions that took place during the module, and again by looking at current research and literature to draw comparisons and extract ideas.

There is an expectation in the modern healthcare system that all clinical practitioners provide the best and most up to date evidence based treatment/s for patients, therefore amalgamating evidence with practice (Sackett 2000). Furthermore, in healthcare environments there is an expectation that evidence forms the basis of treatments, procedures, policies and practices. The evidence that is used, or indeed is supposed to be used, within the modern healthcare environment can only ever come to pass through the existence of research and research findings (Atkins et al 2005). Many of the treatments employed in today's hospitals are as a result of extensive research findings that have been scrutinised and peer reviewed to ensure

effectiveness through evidence. The peer reviewing process is critical to the implementation of evidence within practice and takes place from the early stages of research through to and after the point of implementation in practice. Only through the process of rigorous review, can evidential findings be truly brought into practice, bounded by evidence (Bhandari 2011).

Evidence within clinical practice is not only important for patients and the treatments that they may receive, but also for the clinicians themselves, as in the modern healthcare system there is an increasing professional expectation on all practising clinicians to provide the most up-to-date and appropriate treatment for patients, supported by research. The expectation on clinicians to provide the best evidence base for their practice ensures that the treatment that patients receive is not purely subject to the clinician's personal opinion or educated guesswork. By linking research and research findings with clinical practice, justification and verification can be shown for treatments or potential treatments (Curtis and Drennan 2012).

The importance of linking evidence with practice is paramount for the clinician themselves as professional accountability to provide care to one's patient must be done with the backing of evidence to support his or her clinical decision making (Hamer and Collinson 2005). Professional governing bodies such as the GMC and NMC expect all practising and licensed clinicians to provide treatment which is evidentially supported and can be justified if or when they are called to account. Professional registration and regulatory bodies ensures that clinicians are held accountable when evidence is not used in clinical practice; however this is not a fail- safe way of monitoring the evidence within clinical decision (Pozgar 2011).

Several authors such as Del Mar et al (2008) and Edwards and Elwyn (2009) have suggested that without the evidence behind clinical decision making, not only are clinicians using their own beliefs and ideas, but they are also not following the codes of professional conduct as stipulated by their regulatory bodies. This is a risk to patients in several ways. Patients may be receiving treatment that is not viable or indeed may have been disproven to be effective. Patients may be receiving inaccurate advice which potentially can be passed on to others. Clinicians, who are using treatments driven by personal opinion or genuine scientific uncertainty, risk not only putting patients at risk but also their fellow colleagues (Leighton and

Trask 2009). The cascade of inaccurate treatment or advice can cause negative practices to be adopted by fellow clinicians, students and patients. The point at which personal opinion or genuine scientific uncertainty is being used and indeed replicated by other clinicians is the point at which evidence, and the precursor research, is no longer being followed. This cascade can potentially have extremely negative influences on clinical practice and can be somewhat of an all-consuming problem if not recognised and combatted early (Leighton and Trask 2009).

The risk for the clinician of using his own educated guesswork is indeed a very realistic problem when the modern clinical practice environment has such a diverse array of healthcare professionals with differing ideas on how treatments should or should not be used (Naylor 1995). This is an interesting point and one that was raised during the online forum discussion that posed the questions: What is evidence and how does it affect your practice? The points that were highlighted during the forum discussion revolved around how evidence implements change to clinical practice and how change alters the conception of what evidence means to clinicians (1). The forum discussion was insightful and highlighted the views of several differing clinical practitioners. The overall feel of the group was that evidence implements change through the idea that, by having the research to support one's actions, evidence is being infused into modern medicine and healthcare and that by doing so, expectations of having evidential findings within practice will become the norm.

Bhandari et al (2003) suggest that the most significant point of evidence within clinical practice is that it concretes clinician's clinical decisions or treatments with research that has been peer reviewed. Findings that support a construct idea or an idea that has not yet been disproven is the point in which evidence emerges, and indeed the point in which clinical practice can be changed with evidence as the scaffold. This is an interesting point, as practices or treatments that are currently being used in the clinical environment may not necessarily be supported by evidence. This may be due to the fact that some of the treatments may have been used for a long period of time, and the cascade of inaccurate information may have gone unnoticed. Be this the case or not, through research and evidence, practice could be manipulated to alter un-evidenced elements.

Evidence within the clinical environment is an extremely broad topic and has been described by scores of authors both in a clinical and non clinical context. Whether evidence is discussed

in a clinical or non clinical context, there is somewhat of an agreement that evidence is the recognition of a hypothesis or expected outcome of a construct idea. Aveyard and Sharp (2009), Hamer and Collinson (2005), and Schmidt and Brown (2010) describe evidence as being a clear reasoning or justification behind one's actions, ideas and decisions. There is a broad consensus within the literature, that evidence is the withstanding point of scrutiny. It is the point that cannot be disproven at that moment in time. Aveyard and Sharp (2009) write of how evidence within the clinical environment should always be the skeleton or underpinning scaffold of every clinical decision or action made.They also suggest that the clinician must base and support his or her actions on the premise of evidence for the purpose of positive change within the clinical setting.

Whether evidence is described in the context of healthcare/medicine or indeed in any other context, there is an undeniable starting point to the justification of a hypothesis or theory and this starting point is research (Poolman et al 2007). Authors such as Deutschman and Neligan (2010) and Trinder (2000) suggest that research is the structured trend or pattern of recognisable repeatable experiments that have not yet been disproven or have retained integrity through scientific scrutiny. If evidence is the culmination of research findings that suggest a factor or factors that show positive correlation or trend when tested by external sources, then the process of searching for evidence through research must be logical, repeatable and open to scrutiny (Sober 2008).

Modern medicine and healthcare is and always has been a developing science and as any other field of science requires research as a backbone to drive new discovery and make change .This discovery and change can not only drive research and in turn develop evidence, but also fundamentally change the way evidence based practice is perceived. The expectation within the modern healthcare setting is that evidence is used within all current treatments, driven by underlying research (Gallin and Ognibene 2012). The idea that, through research, practice can be changed is an interesting point and indeed one that was discussed by the online clinical forum group. The following point was made during the online forum: *Only through research can questions be developed and answered and practice be evidentially changed* (2). The online forum felt that the future of evidence based practice lies with the amalgamation of not only evidence with practice, but also with the belief of having evidence within practice. The

principle of having or needing evidence in practice can set a precedent for the future development of medicine and healthcare in general, as through changes in expectation comes development (Poe and White 2010).

The formulation of a clinical question can potentially be the precursor for future research, and many clinical questions or research questions can come to mind. Clinical questions are important as they can be the beginning point/s of development and indeed change within clinical practice (Azzopardi 2007) as, if a clinician has a clinical question that needs to be investigated, it could potentially be put forward as a research question. Clinical question development tools can be used. P I C O is one such tool that can be used to help form a clinical question from a case study or indeed an unknown clinical variable. P I C O can be used to divide an unknown into the following subgroups:

(P) Population/patient
(I) Intervention/indication
(C) Comparator/control
(O) Outcome

Different types of clinical questions may focus on how to treat a disease or a condition. Within evidenced based practice, treatments and therapies are sometimes referred to as interventions, and such questions are questions of intervention/s. Interventions themselves can cover a wide range of activities from drug treatments and other clinical therapies, to lifestyle changes. Interventions can include individual patient care or population health activities (Black 2013).

In order to illustrate how P I C O can be used to formulate a clinical question, a clinical case study example will be examined and turned into a clinical question. A 45 year old male patient presents with recurrent exacerbation of asthma to the emergency department. The episodes have been treated with nebulisers and several courses of bronchodilators, however the symptoms keep recurring. The patient asks if recurrences can be prevented.

In order to convert this scenario into a clinical question, P I C O can be used in the following way:

(P) Population/patient	=	patients with recurrent exacerbation of asthma
(I) Intervention/indicator	=	nebulisers
(C) Comparator/control	=	no treatment
(O) Outcome	=	reduction in recurrence rate of exacerbation of asthma

If P I C O is used as a tool to develop a clinical question, the following question could be derived from the above categories: 'In patients with recurrent exacerbation of asthma, do nebulisers, compared with no treatment, reduce the recurrence rate of exacerbation of asthma?' During the online forum discussion P I C O was discussed as a tool to derive clinical questions and a clinical question was created by the group. The group discussion surrounding P I C O looked at how, as clinicians, many clinical scenarios can occur, and that by having the tools to separate the elements of a clinical question, potential research questions can be formed more easily (3).

In order for clinical question forming to occur, the idea must present in the mind of the clinician. The idea or thought may be from the result of seeing something in the clinical environment which requires further investigation or interpretation. From the point at which the idea or question is in its infancy to the point where it becomes a serious research question, stages of testing begin. The clinical question may be formulated through P I C O or another tool, and the test of scrutiny must be endured, after which time a hypothesis may form the basis of the proposed research (Keele 2010).

A hypothesis can only be tested through the process of research, which may in fact disprove it, resulting in a non viable research project that cannot then be validated and therefore cannot hope to be supported by evidence. If on the other hand, a hypothesis has been unable to be disproven, it may then become supported by evidence at which point it may have the potential to develop into a form of evidence based work (Martin and Bridgmon 2012).

The point at which a treatment, which must be supported by evidence, is introduced into the healthcare system, is the point at which all attempts to disprove the hypothesis of the treatment

have failed. At the point in which evidence supports a treatment/s, the integration of evidence within clinical practice is secured for the time being (Singh and Bajpai 2008).

In essence it could be said that evidence is the testing of the mettle of a claim; it is the validation that something is what it is believed to be. Only through rigorous testing and reviews can evidence be drawn on a subject or subjects. In order to understand what evidence is and how it becomes the fundamental structure of evidence based practice, research itself needs to be examined.

Research and research methodologies is a very broad topic, and indeed too broad for the remit of this work alone, therefore research will be discussed in an overall manner considering the types of research that are used and their relation to formation of evidence within practice. Research has been described by Gratton and Jones (2010) and De Vaus (2001) as a systematic investigation into an area or areas of interest for the purpose of establishing facts that can produce new conclusions. Research covers not only clinical science, but all sciences. Research is fundamental to the underpinning of clinical practice and every standard of expectation within science as a whole (Lederman and Abell 2014).

Authors have differing interpretations of what research means and how it interacts in evidencing science. The common agreed element of research is that only through its process can questions be answered and conclusions be drawn. Holroyd-Leduc and Reddy (2012), Malloch and O'Grady (2010) and Driscoll (2007) advocate that the fundamental structure and nature of evidence cannot exist without research, as without the interpretation of a claim, a claim can hold no weight. Research itself has a starting point or beginning, as briefly discussed earlier in this work when looking at the P I C O for research question formulation. Ideas or questions can become research questions if they are valid and can hold substantial scrutiny, but at what point does this occur and how does this process manifest? White (2009), Hulley (2007) and Polit and Beck (2004) suggest that the starting point of research, or the pivotal moment that research begins, is the moment that the idea or thought has been reviewed or peer reviewed and found to withstand the test of scrutiny. The thought or idea itself may have been a reflection of a clinical case such as the example given earlier in which the clinician may have asked why, when or how has this come to be and how could this be improved, changed or reinterpreted.

Jackson (2008) suggests that a concept or idea that arises from personal professional understanding or interest can make the process of constructing research questions from ideas or thoughts easier, because of the underlying interest and indeed knowledge in the chosen subject area. This point is also discussed by Squires et al (2010) and Murchison (2010) who suggest that the professional mind, whether this be that of a clinician or indeed a professional in another field, may have the added credibility of raising ideas or thoughts to the level in which they can become significant enough to deserve further examination on the merit of scientific or professional reasoning. This is an interesting point, as within the healthcare system, treatments as well as policies and other areas have all arisen from the idea that something can be changed or manipulated, often coming from the experiences of individuals or teams of professionals working in a specific field of medicine or healthcare. The credibility of the clinician/s may indeed alter the actual chance that an idea can arise and progress to the stage of a research question and indeed onto a research project.

Hulley (2007) suggests that an idea is a possible course of action for a problem or unknown variable, and that if evidence is built on the premise of research, research itself and the types of research should constantly be examined for bias in relation to the subject matter. The point Hulley(2007) raises around bias and the research process is very relevant to the clinical environment, as many healthcare professionals have long careers and extensive knowledge around subject areas, but may have been driven by professional/educated guesswork rather than by research driven thoughts.

The types of research methods, that can be used once a significant question has been formed and indeed reviewed, are broad and dependent on the need for data retrieval. In healthcare research, the quantitative, qualitative and pragmatic approach has often been adopted, again dependent on the need for data retrieval. Pope and Mays (2013) suggest that the quantitative and qualitative research method is most commonly used in clinical research, as although differing in approach, both have been substantially researched for their effectiveness as research methods.

The quantitative research methodology is described as being a positivist/post-positivist paradigm that usually involves the collection and conversion of data into numerical form for the purpose of statistical calculation (Creswell 2013). This type of research method is often used in clinical healthcare in order to ascertain numerical significances in therapies and treatments. The quantitative methodology can be helpful in ascertaining whether current treatments in clinical practice are statistically significant in relation to positive or negative outcomes (Newman 2000).

The qualitative research methodology is described as being the social constructivist paradigm in which emphases on the socially constructed nature of reality are drawn (Merriam 2009). Fundamentally, qualitative research is the recording and analysing of human behaviour. This method of research is also interested in contradictory beliefs, behaviours and emotions for the purpose of gaining an insight into complex understanding of people's experience rather than gaining larger quantities of numerical data from broader sources (Silverman 2010).

The pragmatic or mixed methods approach adopts the best methods suited to the research problem itself. The pragmatic approach allows for more freedom within actual research methodology and construct parameter, as it allows for a more open approach to the research question by considering multiple approaches to form the best measurable outcome (Denscombe 2014) and (Jolley 2013).

In conclusion, the risk of involving personal ignorance and genuine scientific uncertainty in the clinical environment is without doubt a significant one, and indeed one that has been highlighted over the years in the healthcare system, which in turn has resulted in a shift towards the concreting of research and therefore implementing evidence in practice. However, even with all of the research protocols and the current trend towards treatments that are supported by research and therefore evidence, the fact remains that some may choose to use practices that are not proven or indeed are personal choices. Additionally, the following questions must be posed: Does the research and the subsequent treatments that come into practice have a subjective bias when originating from clinical practice? Does the clinician or the clinical team in practice sway the research proposal itself through stand point and reputation and is this

accounted for in all evidence based clinical treatments? Does personal experience blur the lines of what evidence is? Does the factor of bias play a significant enough force to actually influence research and hence evidence, therefore skewing the formation of evidence within practice?

Though these questions are speculative, the fact that research and evidencing of research is heavily open to scrutiny may suggest that some of these factors are at least minimised. It may be impossible to eradicate bias and in fact clinical decision making that is not evidenced based, but it may be possible to reduce it significantly through good research resulting in evidence. This in turn could change the way clinical practice is perceived and indeed could become a beacon of education and expectation for the future generations of clinicians where evidence is an absolute expectation by all.

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Footnote for Online Tasks

(1)

Stage (3) Task (1) what is this concept of Evidence Based Practice (EBP)? Online group discussion on the concepts of evidence basing in clinical practice.

(2) Stage (3) Task (1) what is evidence? Online group discussion on what evidence is and how it interacts within clinical practice.

(3) Stage (3) Task (3.1) Using P I C O to develop a clinical question.