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THE CLINICAL INFORMATIONIST: A MODEL ROLE FOR PHARMACISTS IN EVIDENCE-BASED HEALTHCARE DELIVERY

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ABSTRACT

Background: Time constraint and other factors make it difficult for clinicians to retrieve and effectively utilize information from current best evidence resources during clinical decisions at the point of care (PoC) of patients. Clinical informationists bridge this gap by providing vital clinical decision support to clinicians towards effective evidence-based healthcare delivery. Medical librarians perform this role to limited scope. Few research works have reviewed this emerging clinical informationist specialist as a model role for pharmacists in the healthcare team.

Objectives: To review published research on the clinical informationist and the challenges of evidence-based healthcare delivery. This was intended to provide an up-to-date international perspective on this emerging role for pharmacists towards improved patient's care and achievement of the goals of evidence-based healthcare delivery.

Method: Published studies were retrieved through electronic searches in the MEDLINE, PUBMED and other sources using these search queries: clinical informationist pharmacist's roles, clinical informationist evidence-based healthcare. Previous published studies on the emerging role of pharmacist's as clinical informationists were reviewed. The challenges to effective performance of these roles by pharmacists were examined. Recommendations on how they can best be used as clinical informationists in the healthcare team were made.

Keywords: Pharmaceutical Care, Clinical Informationist, Health Informatics, Evidence-Based Healthcare, Clinical Pharmacist's

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1.0 INTRODUCTION

Evidence-based healthcare (EBH) has been defined as the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients and delivery of healthcare services [1]. This principle of care is the current global strategy to achieving standardized healthcare that is of high quality, cost effective and safe. Current best evidence in this definition refers to the up-to-date information from valid research about the effects of different forms of health care, the potential for harm from exposure to particular agents, the accuracy of diagnostic tests, and the predictive power of prognostic factors [2]. This information is usually available in clinical evidence resources in form of treatment guidelines and expert group'sreports based on valid research findings. EBH extends to all professions associated with health care notably pharmacy, medicine, and nursing among others. Effective delivery of evidence-based healthcare requires that healthcare professionals apply research evidences directly to patients at the point-of-care (PoC) [3]. This is not usually the case in actual clinical practice. There is a yawning gap between the plethora of current best evidence available in evidence-based resources and the actual application of such research evidence at the PoC patient's. Time constraints, lack of clinical informationist role models and the enormity of information resources to be consulted are some of the most common reasons for this gap.

The demands of everyday practice often preclude clinicians from spending the time required to address many questions that arise during patient care such that most of these questions are scarcely pursued or answered [4, 5]. This has necessitated the roles of information specialists described by some researchers as the clinical informationist [6]. These information specialists serve as the bridge between the current evidence database and POC application of these evidences through a functional decision support system in the healthcare process. Their roles include sourcing, retrieval and synthesis of current best evidence and making them available to clinicians at patient's PoC. The clinical medical librarianship (CML) model based on the use of medical librarians to provide these services have been documented [7, 8]. This model, however, met with limited adaptability and other challenges to its widespread applicability [9,10]. There were concerns about the insufficient number of medical librarians as well as their professional training and practice roles. Pharmacist's by virtue of their expertise, professional services and position in the healthcare team have been proposed as most suitable health professionals to perform these clinical informationist roles[11]. Using pharmacist's

to perform this function would greatly advance the effective delivery of evidence-based healthcare and optimize the entire healthcare process.

1.1 Healthcare informatics and evidence-based healthcare

The dynamics of healthcare information management is the subject of healthcare informatics which is the interface between information science, computer science and health care. It deals with the resources, devices and methods used to optimize the acquisition, storage, retrieval, dissemination and application of information in healthcare and biomedicine. Health informatics is applied to all areas of healthcare: pharmacy, nursing, clinical care, dentistry, public health and biomedical research. There are, however, several challenges to its effective use to achieve evidence-based healthcare delivery. The enormity of ever changing current evidence database that increases exponentially, complex retrieval system, lack of informationist professionals and time constraints are some of the most documented of these challenges[12, 13, 14]. Other potent constraints identified by researchers include the limited coverage of information resources and lack of readily available syntheses of the voluminous primary sources of clinical information[15]. Thus the practical scenario in most healthcare settings is truly a paradox. Healthcare professionals with inadequate time to consult the vast array of information in biomedical resources still face growing demand for evidence-based practice. They are expected to maintain the core principle of EBH which requires integrating individual clinical expertise with the best available external evidence from current best evidence sources, [16, 17]. For this reason the well researched up-to-date evidence in several information resources are not readily available to healthcare professionals at the patient's PoC. This obvious gap requires to be bridged if EBH is to be achieved. The clinical informationist model has been proposed to achieve just that, [9].

1.2 The clinical informationist model

The clinical informationists have been defined as information specialists that retrieve and synthesize clinical information from current best evidence sources and make them available to the clinical team to meet specific healthcare needs of patients at the point of care. They are usually professional members of the healthcare team who focus on the intersection between clinical care and the evidence base contained in the literature and in biomedical resources. The informationist acts as an expert in identifying and addressing the complex evidentiary needs of the clinical team in resolving the specific clinical needs of individual patients. Combining clinical informationist expertise with healthcare informatics tools has

been described as an effective strategy for supporting patient care decisions making process in order to achieve the delivery of evidence-based healthcare[9].

The terms 'clinical informationist' originated from the editorial published by Davidoff and Florance in 2000AD[6]. Ever since then there has been growing interest in this concept. The clinical informationist model evolved from the CML consultancy services which expanded medical librarian's roles to include information consultancy and decision support for patient care. The Eskind Biomedical Library (EBL) at the Vanderbilt University Medical Center (VUMC) developed the Clinical Informatics Consult Service (CICS) to implement this informationist concept[18]. The use of medical librarians as clinical informationists in the CML model, however, met with limited uptake and other significant challenges related to the limited numbers of medical librarians, their training and professional roles[10].

Only a few research publications have explored pharmacist's roles in this emerging clinical informationist decision support system[11]. Pharmacist's play vital roles to achieve evidence-based healthcare delivery system as pharmaceutical care providers and clinical pharmacy consultants. They occupy unique position in the healthcare system being medicinal products experts and medicine information specialists with necessary clinical background. By their training and experience in the clinical team they can function effectively as medicine information specialists and clinical informationists. In the healthcare system pharmacist's are frequently called upon to provide or clarify medicines information to diverse enquirers notably the patients, physicians and other health care professionals. This makes them highly suitable for this yet evolving clinical informationists model role.

1.3 Pharmacist's as clinical informationists

The current global repositioning of the pharmacy profession is most desirable to ensure professional development, efficient use of healthcare resources and occupational satisfaction for pharmacist's. Advances in technology that resulted in proliferation of high-tech and complex pharmaceutical products and dosage forms had narrowed the role of pharmacist's to compounding, dispensing and labelling of pre-fabricated medicinal products. This level of roles hardly allows the full potentials of knowledge, skills and expertise of pharmacist's to be effectively utilized in the healthcare process. There was thus need for professional paradigm shift in the evolution of pharmacy. About mid 1960s the pharmacy profession had evolved towards a more patient-focused and outcome-oriented practice. The concept of clinical

pharmacy that developed about this period ushered in the era of shift in professional paradigm and rapid transition in the roles of pharmacist's. There was rapid expansion and integration of the professional functions of the pharmacist, their increased professional diversity and responsibility as well as closer interaction with the patients, physicians and other healthcare professionals[19]. The high incidence of drug therapy problems (**DTPs)** widely documented across the globe by early 1990s and the recognition of these DTPs both as serious public health and social needs of patients underscored a more clinical and patient-focused roles for pharmacist's. The pharmaceutical care model that evolved about this time assimilated the clinical pharmacy concept in both focus and practice[20].

Clinical pharmacy foreshadowed the philosophy of pharmaceutical care as a blend of caring orientation in pharmacy practice with specialized knowledge, experience and judgement to achieve optimal patient's outcomes. Pharmaceutical care concept thus became both the new philosophy and the future direction of education and practice of the pharmacy profession [21, 22]. Pharmaceutical care has been defined as the responsible provision of drug therapy to achieve outcomes that improve the quality of life of patients [23]. Clinical pharmacist's work primarily in hospitals and acute care settings though their services can also be extended to the community pharmacy setting. As active members of the multidisciplinary ward rounds team they contribute to the bedside therapeutic discussions and patient care decision making process in hospitals. This hospital-based clinical ward rounds provide a veritable locus where pharmacist's can effectively function as clinical informationist to provide patient-focused services towards achieving evidence-based healthcare delivery.

The professional activities of clinical pharmacist's impart on patients care at three different levels: before, during and after the prescription and administration of medicines. At each of these levels clinical pharmacist's provide pharmaceutical care services that include but not limited to providing medicine information, planning and communicating therapeutic interventions and regimens, preparing and dispensing of medicines. They also prepare personalised formulations, carry out medicines use monitoring and evaluation, patients counselling and research activities on outcomes. Pharmacist's usually perform these clinical patient care roles within the multidisciplinary ward rounds in hospitals where they help to optimize the care process and outcomes. They identify and resolve drug therapy problems, provide timely and quality medicine information as well as take charge of the management of patient's drug therapy through dependent or independent pharmacist's prescribing discharge

prescribing and discharge medication management, [24]. This way pharmacist's contribute significantly to the decision making process at patient's point of care. These clinical services of pharmacist's and their direct involvement in patients care have been extensively documented and shown to impart positively on patient's outcomes, the healthcare process, health systems, the pharmacist's themselves as well as on other healthcare professionals[25, 26, 27].

Pharmacist's are thus strategically positioned to take charge of clinical information management systems and to function effectively as clinical informationists within the healthcare continuum. Their background training, experience and skills in clinical contents and drug information management makes them most suited for this role. Further training and skills development in clinical contents and clinical information management may however be required for effective performance of these roles. In several countries clinical pharmacist's already take professional responsibility for managing patient's medicine therapy through dependent and/or independent prescribing [28, 29]. In several other countries expert groups and professional bodies are pushing for similar rights for clinical pharmacist's.

Besides in-depth professional knowledge and skills in core pharmaceutical contents, effective communication, information technology, team role play pharmacist's require additional tools in order to function effectively as clinical informationists. They also require functional knowledge and skills in computer applications and clinical information systems management. Pharmacist's should also have other clinical resource assistants such as Personal Digital Assistance (PDA) of reference resources and steady access to the Internet in order to function effectively as clinical informationist.

1.4 Challenges to the clinical informationist model

One of the greatest challenges of this model is that medical librarians who function as clinical informationist usually communicate with clinicians and the rounding team using electronic information infrastructure from a location away from the clinical rounds environment. There is need for the clinical informationist to be in the company of the rounding team to facilitate information exchange and make the care process more efficient. In recent survey librarians they identified multiple barriers to the spread of their role as clinical informationist. Notably among which were funding and proper integration in the healthcare team, [30]. Using pharmacist's as clinical informationists would remove this barrier since pharmacist's are already members of the multidisciplinary ward round team in most health systems across the globe. A number of researchers have proposed a model for using

pharmacist's as clinical informationists in the healthcare system [31, 32]. All that is required is for pharmacist's to be included as part of multidisciplinary ward rounds in hospitals where this has not been done. Pharmacist's also need to take up this responsibility and update their skills to function effectively as clinical inormationists.

Besides the geographical barrier of clinical informationist model based on medical librarians there is also cultural barrier where clinicians know little or nothing about the existence of the clinical informationist or what services they can offer. There is also the problem of poor health system information management logistics and infrastructure especially in resource-restricted practice environments where electronic health records databases are largely non existent.

There could be some challenges to pharmacist's assuming these clinical informationist roles in the healthcare system. These may include potential for antipathy from other healthcare team members, or even pharmacist's themselves, funding to cater for the extra man-hour involved, logistics (training and resources), inertia (resistance to change), requisite pharmacy staff particularly clinical pharmacist's as well as policy and regulatory challenges. These, however, require further research and institutional strategies to overcome.

2.0 RECOMMENDATIONS

Clinical informationist models need to be set up in health facilities in order to facilitate evidence-based healthcare delivery. Pharmacist's should be used as clinical informationists in the healthcare system to optimally utilize their professional expertise for the benefit of the patients and the entire healthcare process. However, there is need to put in place electronic data management systems in the health institutions particularly in resource-restricted healthcare facilities to facilitate efficient clinical data management and assist clinical informationist. Pharmacist's and other clinical informationists need to be trained and equipped with state of the art health informatics tools in order to function effectively to promote EBH. Pharmacist's require sharpening their knowledge of health information systems management and keeping abreast of evidence-based healthcare information. Where this has not been done pharmacist's should be included in the multidisciplinary ward round team in health institutions to make their clinical expertise more accessible to both the patients and other care givers. As clinical informationists the clinical pharmacist's working in the rounding team would reduce answering time to clinical queries and make the entire care process more efficient. It would also free clinicians' time for more efficient patient care and training of students and clinical interns.

In conclusion there is need for the clinical informationists in healthcare delivery systems to promote evidence-based healthcare. Pharmacist's are professionally competent to effectively function as clinical informationists to advance evidence-based healthcare delivery.

References

1. First Annual Nordic Workshop on how to critically appraise and use evidence in decisions about healthcare, National Institute of Public Health, Oslo, Norway, 1996.
2. Marwick C, Proponents Gather to Discuss Practicing Evidence-Based Medicine. Journal of the American Medical Association. 1997; 278 (7): 531-532.
3. Centre for Evidence Based Medicine Glossary. http://cebm.jr2.ox.ac.uk/docs/glossary.html, (Assessed on August 22nd, 2009)
4. Ely JW, Osheroff JA, Ebell MH, Bergus GR, Levy BT, Chambliss ML, et al. Analysis of questions asked by family doctors regarding patient care. BMJ. 1999; 319(7206):358–61.
5. Green ML, Ciampi MA, Ellis PJ. Residents' medical information needs in clinic: are they being met? Am J Med. 2000; 109(3):218–23.
6. Davidoff F, Florance V. The informationist: a new health profession? Ann Intern Med. 2000; 132(12):996–8.
7. Cimpl K. Clinical medical librarianship: a review of the literature. Bull Med Libr Assoc. 1985; 73(1):21–8.
8. Veenstra RJ. Clinical medical librarian impact on patient care: a one-year analysis. Bull Med Libr Assoc. 1992; 80(1):19–22.
9. Nunzia B. Giuse, MD, MLS, Taneya Y. Koonce, MSLS, Rebecca N. Jerome, MLIS, Molynda Cahall, MA, MSLS, Nila A. Sathe, MA, MLIS, and Annette Williams, MLS Evolution of a Mature Clinical Informationist Model Am Med Inform Assoc. 2005 May–Jun; 12(3): 249–255
10. Schacher LF. Clinical librarianship: its value in medical care. Ann Intern Med. 2001;134(8):717–20. Lipscomb CE. Clinical librarianship. Bull Med Libr Assoc. 2000; 88(4):393–5.
11. Gary D. Byrd, Can the profession of pharmacy serve as a model for health informationist professionals? J Med Libr Assoc 90(1) January 2002
12. Ely JW, Osheroff JA, Ebell MH, Chambliss ML, Vinson DC, Stevermer JJ, et al. Obstacles to answering doctors' questions about patient care with evidence: qualitative study. BMJ. 2002; 324(7339):710.
13. Koonce TY, Giuse NB, Todd P. Evidence-based databases versus primary medical literature: an in-house investigation on their

optimal use. J Med Libr Assoc. 2004; 92(4):407–11.

14. McAlister FA. Applying evidence to patient care: from black and white to shades of grey. Ann Intern Med. 2003; 138(11):938–9.
15. Putnam W, Twohig PL, Burge FI, Jackson LA, Cox JL. A qualitative study of evidence in primary care: what the practitioners are saying. CMAJ. 2002;166(12):1525–30
16. Majumdar SR, Chang WC, Armstrong PW. Do the investigative sites that take part in a positive clinical trial translate that evidence into practice? Am J Med. 2002; 113(2):140–5.
17. Oliveri RS, Gluud C, Wille-Jorgensen PA. Hospital doctors' self-rated skills in and use of evidence-based medicine—a questionnaire survey. J Eval Clin Pract. 2004; 10(2):219–26.
18. Marcus A. Banks, Frederick L. Ehrman, Defining the informationist: a case study from the Frederick L. Ehrman Medical Library; J Med Libr Assoc. 2006 January; 94(1): 5–7.
19. Alminana, M. A., Schredering, A. F., Hekster, Y. A., Huon, Y., and Sroccaro, G. 2003, The Need For Clinical Pharmacy, European Society of Clinical Pharmacy, Brussels Belgium (Accessed at www.escp.nl on 12th September, 2009)
20. Pearson, G. J. 2007, Evolution in the Practice of Pharmacy – not a revolution. Canadian Medical Association Journal, Vol. 176 (9), p. 1295
21. Developing pharmacy practice: A focus on patient care. Handbook. World Health Organization in collaboration with International Pharmaceutical Federation. 2006. WHO/PSM/PAR/2006.5
22. Hemant Patel, How the Pharmacy 2020 project is lighting the way for pharmacy's future, Pharmaceutical Journal, 2008; 280; (Accessed, October, 5th 2008) At http://www.pharmj.com/noticeboard/series/pharmacy2020.htm
23. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. Am J Hosp Pharm 1990; 47: 533-43.
24. Emmerton, L. Marriot, J. Bessel, T., et al. 2005, Pharmacist's and prescribing rights: review of international developments. J. Pharm. Pharm. Sci. Vol. 8 pp. 217-225
25. Malueny, O. S., Mazur, E. Charney, P. Wang, Y. and Fine, J 2007 Using multidisciplinary rounds to simultaneously improve quality outcomes, enhance resident education and shorten length of stay. Journal of general internal medicine Vol. 22 (8) pp. 1073-1079
26. Bosma, L., Jasman, G.G.A. Franken, A. M., Harting, J. W., and Van den Bemt, M. L. 2007 Evaluation of pharmacist's clinical interventions in a Dutch hospital setting.

Pharmacy world and science, Springer, Neterlands, pp. 9136-9139

27. Bosma, L., Jasman, G.G.A. Franken, A. M., Harting, J. W., and Van den Bemt, M. L. 2007 Evaluation of pharmacist's clinical interventions in a Dutch hospital setting. Pharmacy world and science, Springer, Neterlands, pp. 9136-9139
28. Emmerton, L. Marriot, J. Bessel, T., et al. 2005, Pharmacist's and prescribing rights: review of international developments. J. Pharm. Pharm. Sci. Vol. 8 pp. 217-225
29. Buck, C. T., Brandstrup, L., Branslund, I. and Kampmann, J. P. 2007, the effects of introducing a clinical pharmacist on orthopaedic wards in Denmark. Pharmacy world science, Vol. 29 pp 12-18
30. Nila A. Sathe, Rebecca Jerome and Nunzia Bettinsoli Giuse Librarian-perceived barriers to the implementation of the informationist/ information specialist in context role, J Med Libr Assoc. 2007 July; 95(3): 270–274.
31. Root Jorgensen DB. The informationist. Ann Intern Med. 2001. Feb; 134(3):251.–3.
32. Houghton B, Rich EC. The informationist. Ann Intern Med. 2001. Feb 6; 134(3):251.–2.