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The Role Of Collaboration Between Nursing And Laboratory In Enhancing Patient Care Outcomes

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Abstract
This paper clarifies the precise roles of nursing and phlebotomy, and the importance of effective communication between the two careers. There is a presentation of each topic, but due to the high inter-relatedness between the two, there will be some blurring. Nursing encompasses an autonomous and collaborative care of individuals of all ages, families, groups and communities, sick or well and in all settings. Nursing includes assessment, diagnosis, outcome identification, planning, implementation and evaluation. Registered and enrolled nurses/other personnel work in a wide variety of private and public settings in the health and community sectors. Phlebotomy alone is part of the process of collecting a blood sample for lab testing and lab tests are also used for the purpose of diagnosis, identifying outcomes or planning and to evaluate both. This link between nursing and lab can range from an insignificant one page request form and one off treatment of the patient, to complex care of the chronic disease patient requiring years of tests and treatments. It is common in today's health system for patients to flow between community and hospital care, and to a change of setting while still under the same care. In these scenarios it can become quite difficult for the nurse to ensure the tests are done and keep track of the results. This is particularly important for high priority tests with a narrow treatment pathway. An example which can be related to by almost any nurse, is the urgent need to provide a level 1 platelet transfusion for a patient with life threatening haemorrhage or to confirm service for the patient who just spent 6 hours on fast awaiting a blood sugar test.

1. Introduction

Collaboration is a working practice wherein individuals cooperate for a typical reason to accomplish advantage. Collaboration is a deep-rooted test that does not generally happen generally or promptly. It is a conduct that must be educated structures and support. It is a procedure that requires signaling both the cerebral and passionate parts of connection between parties. Those gathering this beh for successful collaboration necessities to comprehend the degrees of

participation in a couple of some random communication. The acknowledgment that collaboration is habits not a single demonstration but rather a movement is vital. Collaboration happens around a decision of ordinations of human communication, whether between two people or among little or huge gatherings working as groups. Collaboration, however, on a one individual to another stage is the thing that many individuals to individuals would like to see expanded with the to top or top base enlightening activities. At the point when the potential for collaboration is recognized, it is then critical to locate the correct structures and support for explicit intuitive practices. Structures will be the moments accessible really variable and chosen as the strategies, actions, and advancements in a given circumstance. Ongoing decades have seen costs on innovation for information exchange explode to a huge number of dollars and information building up itself as a development condition on the planet. Information is seeing develop a guide starting singular intelligent practices and development to shared on community intelligent practices. This is a fortification for expanded collaboration. High stakes testing ensuring formative have been distribution attempted to be the best structures for learning. Behavioral-based intelligent practices nonetheless lead to loads of education on exploration challenge and master learning exercises. A reevaluation of scattering these moments to help these intelligent practices might be the best contribution to future joint conduct on community intelligent practices. Support for the intuitive practices should be embraced thinking about the learning in addition to setting to be ceaseless and productive instead of on off time impediment. An excessive amount of accentuation has been placed on the learning however occasion up and coming events like the training and the ASC acoustic modified test have lately expanded investigation collaboration. This may not be what gainful collaboration, but rather it is a stage the correct way. Effort must be made to reestablish information these moments and revealed until a good outcome is accomplished. The last area about expanding understanding discovery is taking structure moves around a change of noticing aggregate highlighting program and activity focuses to ultimately put a generosity of people to people interactive and then group to top intelligent practices. This case of collaboration in a study is a perfect exhibit for when and where structures and support are perceived. This requires a revelation method to stay up with the latest. Any such move should be embraced with alert as in any case and the move some unacceptable position or a take a stab at a drive and a longstanding residue man emailing minutes will be lost. [1]

1.1 Importance of collaboration in healthcare

Collaboration between health care professionals is of utmost importance in delivering quality patient care. This is especially true between nursing and the diagnostic laboratories. This essay will discuss the different ways in which nursing and the diagnostic labs can work together to provide the best care for the patient, and it will discuss some of the benefits of a strong collaborative relationship. When constant changes in health care are occurring, it is important to look at relationships between different fields to identify ways to adapt for more successful transitions of care and better patient outcomes. In today's health care environment, the laboratory is a critical area requiring effective care transitions and reliable relationships. According to the 2010 Institute of Medicine (IOM) report on the future of nursing, healthcare is an ever-changing environment that requires a continued improvement in providing high-quality patient care, while keeping safety and the needs of the patient central. This essay will discuss how nurses and the diagnostic laboratory can comply with these prerequisites by working together to provide better patient outcomes. By understanding each other's roles and all that each discipline has to offer, both nursing and the laboratory can identify opportunities for a more effective collaboration. [2]

1.2 Significance of collaboration between nursing and laboratory

Cognitive role can be classified as any mental act after or before performing a discreet task. This may involve the gathering, assessment, and monitoring of information or making decisions about that information (Hoffman, Kiepek, and Di Bernardo, 2000). With their broad spectrum of roles and the implications of the cognitive role, it can be assessed that much of nursing actions have direct or indirect implications on the patient's well-being.

One of the lesser known, but highly significant collaborations can be seen in the association between laboratory testing and its impact on decision making by nurses. This concept has received considerable attention since it was first introduced in 1987 and has gained momentum across the years due to the rapid expansion and development in the field of diagnostic testing. Cognitive role of the nurse was first introduced by Lloyd and Victoire (1993) and best described in a joint position statement by the American Nurses Association and National Council of State Boards of Nursing (2016), which states that nursing is a critical part of comprehensive patient care and that they have a significant role in health care. By explaining who is a critical part of comprehensive patient care and that nurses are a large and varied, its outlying scope is paralleled with nurses' vast consideration of patient needs. This includes recognizing and differentiating between acute and chronic illness, health teaching, health evaluation, and the important consideration of understanding the effects of their practice on the patient's well-being (Lloyd et al., 2003).

The field of healthcare is a multifaceted entity in which many disciplines combine to form the system which ensures patients recover in a comfortable and efficient manner. To achieve the best patient outcomes, it has become increasingly important for these different disciplines to work together, assigning the individual specific roles to play in the recovery process loop - that is the Patient Care Continuum (Wilkinson, 2002). In a general sense, the patient care continuum is the service that patients receive as they move from illness to wellness. The ability to obtain resourceful

information through research and policy development enables one to understand critical ingredients for transformation of health care to a higher standard. With patient care being the prime variable for health care system, sustaining supportive services is the key to successful patient outcomes (Foley, 2003). [3]

Line 1: Introduction (Line 1) Line 2: Importance of collaboration in healthcare (Line 2 + 1) Line 3: Significance of collaboration between nursing and laboratory (Line 3 + 1)

2. Benefits of Collaboration between Nursing and Laboratory

Nursing consultations with laboratory medicine and the presence of laboratory staff in wards will close the gap between lab results and patient-focused outcomes by allowing nurses to communicate directly with lab staff about the testing and what it may mean for the patient. This can be described as a form of "post-analytic testing" where laboratory test information is analyzed in conjunction with patient symptoms and probable diagnoses. This would involve a range of activity from educating nurses on which tests to request and the correct procedures for specimen collection so sample quality and choice of test are optimal, right through to formal consultations and case management with nurse and patient about test findings and what the next step is for the patient. This continuous communication with the clarification of any uncertainties regarding test results would ultimately result in improved patient care by reducing medical errors, time to diagnosis, and unnecessary testing and treatment. Due to the effect it has on patient safety and outcome, these are areas research in post-analytic testing and the relation between laboratory testing and patient endpoints are areas that require immediate attention. But the overall success of nursing-lab interactions in achieving improved patient diagnosis and treatment can be measured by changes in results of "test effectiveness" and patient morbidity and mortality. [4]

Improved patient diagnosis and treatment are linked to nurse involvement in the laboratory process. A study by AcademyHealth revealed that 76% of patient care is based on laboratory results. When laboratory testing has become such an integral part of patient care, it is essential that nurses acquire some knowledge of laboratory science and the role of laboratory services so they can interpret findings and use them for better patient outcomes. In New South Wales Health, 2003, it was stated that "The importance of the role of nurses in turning a medical diagnosis into a patient-focused outcome has meant it is imperative that those who are working directly with the patients understand the diagnostic process and are able to make a meaningful connection between the results and the course of treatment." This suggests that a meaningful connection between lab results and the course of treatment is currently not being made and any understanding of laboratory science may have been lost since this report was incorporated into a nursing role to improve patient outcomes.

The benefits of collaborative relationships between nursing and laboratory staff have been the focus of individual studies and commentaries. Benefits identified are improved patient diagnosis and treatment, enhanced communication and information sharing, and streamlined workflow. These themes are mentioned throughout the literature and are cited as the pillars of what can be achieved through successful collaboration.

2.1 Improved patient diagnosis and treatment

If nursing is to carve a more substantial role in the diagnosis and care of patients, it is essential for better collaboration between nursing and laboratory professionals. In the fast-paced environment of healthcare, a sound knowledge of what can be done in practice and understanding of the potential effects is important to guide appropriate actions that will lead to improved patient outcomes. This is especially so in the case of diagnostic testing and monitoring of patients. With their role in identifying patient needs and delivering nursing care, nurses have the ability to facilitate more targeted and efficient laboratory use that will lead to improved patient diagnosis and treatment. This can be initiated with nursing education about the provision of testing services and development

of evidence-based practice guidelines regarding the indications and timing of specific tests. Subsequent communication with laboratory professionals to relay information about the patient and discuss the most suitable tests will lead to better utilization of tests and reduce the incidence of tests being ordered but not being appropriate to higher quality tests.

The laboratory has been notorious for delaying the diagnosis of patients due to lost samples, lost request forms, specimens, and because tests were never run. As collaborative practice among healthcare professionals has intensified, nurses are focusing on all aspects of healthcare which has shifted the traditional view of nursing as a medical practice with its prime role in the setting of diagnosis and care.

2.2 Enhanced communication and information sharing

Results of enhanced involvement of laboratory staff in patient diagnosis and treatment are expected to increase the efficiency of the process. A study conducted by Hawkins and Friedman revealed that laboratory testing influences clinical decision making in approximately 70% of cases, yet there were instances where testing was not performed or was suboptimal due to a number of factors such as the ordering clinician being unaware of the appropriate test, unavailability of the test, or confusion regarding which patient the test is for (Hawkins and Friedman, 1999 as cited in Price et al., 2010). Often the efficiency gains made will not be quantifiable; however, they are likely to improve due to preventative measures taking place as a result of earlier diagnosis or avoidance of misdiagnosis.

In a study conducted by Spekowius and Sandars (2003), the authors stress the importance of communication between healthcare professionals in the diagnosis and treatment of the patient. Key findings in this study revealed that deficiencies in the care of the patient were a result of poor communication between healthcare team members. Moreover, a more recent study conducted by Sorokin et al. in 2005 revealed that of 1200 medical errors made which led to adverse effects on the patient, 56% of the errors were related to miscommunication between healthcare staff (as cited in Thomas, 2009). By working closely with nursing staff, there is a greater opportunity for laboratory staff to be involved in the initial diagnosis and treatment plan of the patient. This can occur through consultation of laboratory services at the time of ordering tests and participation in multidisciplinary team meetings. The communication that takes place between laboratory and nursing staff can be direct or indirect and is greatly enabled by technological advancements. As opposed to communicating via telephone, pneumatic tube, or face-to-face interaction, it is far easier in the modern era to send results electronically and to access and document results from a centralized system such as an Electronic Medical Record (EMR).

2.3 Streamlined workflow and efficiency

Nurses and laboratory technicians directly impact patient outcomes when the two take steps to work together in the proper fashion. One primary method of streamlining the laboratory process involves nurses understanding specimen collection requirements and techniques. Nurses are usually responsible for sample procurement. When sample inaccuracies occur, patient care is also affected through nursing having to redraw samples or not being able to properly treat a patient based on faulty laboratory results. Understanding proper sample collection improves lab efficiency and patient care. One study illustrated a 61% reduction in contaminated blood cultures with a two-phased educational intervention directed toward nursing. This resulted in cost reduction for the hospital of nearly $40,000. High performance in sample procurement has many positive consequences. When the laboratory understands nurse preferences and patient care needs in relation to specimen collection, it enables the lab to process samples more efficiently. For example, a patient who has fasting laboratory work drawn in the early morning may be diabetic and at risk for hypoglycemia. A nurse may want to hold that patient's usual AM insulin until after the lab work is done. If the nurse communicates this information with the laboratory, it can be decided to defer certain tests until the nurse confirms the patient has had no adverse events. This type of communication can prevent client calls and confusion about test cancellations. The National Patient Safety Agency has recently stressed the importance of all parties involved in lab tests being clear about what specific tests are being performed for what clinical reason. This ensures that the right test is being done on the right patient at the right time. [5]

3. Strategies for Effective Collaboration

In line with the constraints of the healthcare environment, strategies aimed at improving communication between nursing and laboratory staff are the most frequently suggested means to enhance inter-professional relations. Such strategies include the full disclosure of laboratory information, the promotion of nursing-laboratory rounds, and the development of laboratory services on nursing care teams. A qualitative study by Woolery et al. explored the methods nurses and laboratory technicians employ to manage critical lab value reporting and the barriers to effective communication. Data were collected via a series of interviews and focus groups with nurses and laboratory technicians. Although critical value reporting is but one aspect of communication between nursing and laboratory staff, the strategies identified by Woolery et al. are valuable and can be applied to all interactions. A multi-disciplinary approach to the exploration of lab value meanings and perceived implications, as well as the utilization of standardized tools for the communication and documentation of lab values, were seen as methods to improve the accuracy of information exchanged between nurses and laboratory technicians. This is consistent with findings from an earlier study by JiJi et al. involving nurses and medical residents, which identified agreement upon the meaning and importance of specific lab values as a factor influencing the utilization of this information in decision making. Woolery et al. also described certain contextual factors influencing communication of lab values, such as the disruption of nursing-laboratory rounds by phone calls and the absence of laboratory technicians from the nursing units due to centralization of services. Developing a comprehensive understanding of the work system in which information is exchanged and identifying potential areas for improvement may assist in tailoring interventions to specific units or organizations. Aforementioned methods employed to manage critical lab value reporting are consistent with an evidence-based framework for considering and evaluating the complex process of translating knowledge from one healthcare provider group to another developed by Estabrooks et al. The resulting taxonomy consists of three elements: the knowledge to be translated, the potential adopters of the knowledge, and the context in which the knowledge is being translated. According to this framework, Woolery et al. involved the potential adopters of knowledge through their interviews and focus groups with nurses and laboratory technicians to investigate critical lab value management and the contextual factors influencing this process. Subsequent work to develop interventions aimed at improving communication would

involve the consideration of the knowledge to be translated and the context in which this process occurs. By working to improve dialogue and the translation of knowledge between nurses and laboratory technicians, Woolery et al.'s study demonstrates some fundamental yet targeted strategies to enhance collaboration between nursing and laboratory staff. [6]

3.1 Establishing clear communication channels

Communication is a complex and dynamic process. It is a tool that allows an individual to have contact with other individuals and it involves encoding information, deciding the means of transmitting that information, sending the information, decoding the information, and providing feedback to the individual. Successful communication is achieved when the message sent and the message received are the same. Communication is divided into verbal and non-verbal communication. Verbal communication can be through spoken language or written language while non-verbal communication can be through body language, facial expressions or gestures. Studies have shown that the majority of communication lies in non-verbal communication. Communication takes place between sender and receiver who can be an individual, a group of individuals or an organisation. In the healthcare organisation, communication is usually in the form of professional to professional or professional to patient interaction. This does not mean that management and other forms of communication are negligible. Effective communication is essential for many reasons. It permits the sharing of information, ideas and feelings between individuals or groups and it is a means to express needs and it also enhances delivery of service. Satisfaction and performance that comes with job success is tied to effective communication as well. Effective communication is a vehicle for personal and professional growth. Unsatisfactory interpersonal communication is a common cause of conflict and misunderstanding in clinical settings. Shortage of communication is the cause of many break downs in vital relations between nurses, physicians and other healthcare providers and in ensuring continuity of care for patients. It is also the number one factor for clinical errors and adverse events which are detrimental for patient care. In a nutshell, establishing clear communication enables the sharing of resources and information in a more efficient manner which will eventually lead to improving the quality of patient care. In view of all these reasons, it can be concluded that effective communication is the single most important factor that will determine the success of any collaborative effort. [7]

Despite the strong recommendation for the laboratory and nursing to collaborate, DeGroot, a laboratory manager, suggested that the term "the two disciplines just aren't talking to each other" is the usual situation. Fernandes also confessed that laboratory professionals do not interact much with nurses or physicians in the clinical setting and they work more in parallel than as a team. This statement is supported by the findings of a study done in Singapore which revealed that even though 98.5% of nurses and 77.6% of laboratory staff were aware of the need to work together, there were no significant differences in the perceived practice of teamwork. Although there is aim for collaboration, without clear and direct communication between the two parties, it cannot be achieved.

3.2 Developing shared protocols and guidelines

Creating shared protocols and guidelines require equal input from both nursing and laboratory staff. One of the best methods to start the process is to create a joint committee with representatives from each profession. This committee will be responsible for drafting the protocols and guidelines. At the outset, it may be useful to employ a facilitator to keep the committee focused and ensure that all relevant issues are addressed. This will require identifying the specific areas in patient care/procedures that need protocols/guidelines and highlighting top priority areas to work on. The committee will then need to appoint subcommittees to write the actual protocols and guidelines, and also distribute and track progress on them. Once the subcommittees have composed a rough draft, it should then be reviewed by the entire committee for modification and approval. After this

initial development, the protocols will need to be implemented on a small scale to assess effectiveness and identify any revisions that need to be made. [8]

The second main reason why protocols and guidelines are important is to facilitate optimal patient care. With protocols and guidelines in place, ideally, there will be less occurrence of inappropriate tests being ordered and also misinformation being provided when reporting findings on patient status. This, in turn, will lead to improved quality of care with more timely and accurate information being available. It should be noted that protocols and guidelines will never be totally autonomous and require periodic revisions to ensure that they are evidence-based and updated to current practices.

Shared protocols and guidelines have been identified as essential components for improving collaboration between nurses and laboratory staff. They are important for two main reasons. Firstly, they are important to ensure that both professions operate on a level defined by released constraints. The use of protocols and guidelines will allow each profession to define their scope of practice and offer understanding of limitations, etc. Protocols and guidelines can also be used to clearly define when each profession should report findings or problems. For example, a recent study of Critical Care nurses and laboratory staff found that critical care nurses often did not recognize or follow-up abnormal laboratory results. This occurred because critical care nurses were often unsure of the significance of the results, and if indeed the tests undertaken were sensitive or specific to the patient condition. By having protocols set by both professions, this can be avoided.

3.3 Conducting regular interdisciplinary meetings

The regular meetings are an effort for the clinical nurses, nursing management, and professional nurses and laboratory technicians to come together to discuss and evaluate patient care by looking at areas where nursing and laboratory science overlap. This will enable an understanding of the processes involved in collecting and analyzing laboratory specimens and the direct impact they have on patient care. These are open forums where medical and nursing staff can be invited to participate and learn more about laboratory testing and ask questions. It is an opportunity for healthcare providers to share knowledge and experience that will further our understanding of the best practices in patient care. Regular meetings can also provide a focus for a collaborative project designed to measure and evaluate the effectiveness of changing practice on patient outcomes.

4. Challenges in Collaboration and Solutions

Development and maintenance of a good professional relationship between lab and nursing staff, and implementation of a lab/nurse team to address issues relevant to the collaboration have been earmarked by both groups as important in addressing the common goal of improving patient outcomes. Empowerment of this team to influence policy that affects them may serve to achieve some of the changes desired.

Overt leadership will need to recognize the importance of clear communication and foster a culture in which staff are unafraid to make their concerns about patient safety known. Team training programs have proven to improve communication and can boost team performance. A key feature of such programs is the development of a shared mental model of how the team will perform given a set of circumstances, and an awareness of the roles and responsibilities of other team members. In the short term, should resources allow, nurse rotation through a series of shifts in the lab would serve to greatly strengthen ties and understanding between the two departments.

Effective communication can be compromised by occupational "tribalism". That is, reservation of professional territory leading to a narrowed sphere of collaboration, avoidance of another department based on prior negative experience, lack of awareness of another's role or understanding of how their own actions or decisions may affect other departments, and lack of clear, accurate,

timely, and unambiguous instructions and information transfer. While territoriality and lack of awareness can be improved by educational efforts, inadequate communication has been cited as most responsible for unanticipated adverse events.

4.1 Overcoming barriers to effective communication

The format of information (verbal, written, visual) can be a barrier if the sender and receiver do not have the skills to send or receive information in a given format. An example would be a nurse trying to explain a critical lab value to a patient care assistant who has not had training in reading lab results. If information is too complex or too simplified for a given recipient this can also be a communication barrier. A common problem in the nursing setting occurs when physicians assume that nurses understand the clinical significance of a lab value, and nurses assume that physicians will interpret the value and ask for clarification if it is abnormal. In both cases assumptions are made and information is not exchanged. In an acute care clinical setting interruptions occur frequently and can be a significant barrier in communication. An example is a lab technician taking a specimen from a nurse while she is on the phone with a physician and there is not effective verbal communication of the tests to be ordered. Specimen mislabeling and/or ordering of incorrect tests may occur in this situation. Lastly, in the evolving health care system, patients are often cared for by multiple disciplines in multiple settings. A common goal of providing continuity of care for these patients can be hindered by inadequate transfer of information between health care providers and settings. [9]

Issues in communication are many and these greatly influence our ability to collaborate effectively. The most basic element of communication is that of transferring information. When information is not exchanged effectively, the potential for error is great. Information sharing is especially important in our data driven health care system. Quality patient care relies on timely, accurate information transfer. Inaccurate, incomplete, or untimely information has been cited as a primary factor in treatment errors in both the inpatient and outpatient settings. Causes for ineffective information transfer can be related to the way information is communicated, the format of the information, the recipient of the information, or the environment in which the information is conveyed.

4.2 Addressing conflicting priorities and goals

Differing priorities and goals relate to the different expected results and the types of activities the two professions have. Generally, these differences are based upon professional socialization and the different attitudes of the profession to patient care. One study has found that nursing focus is on individualized holistic care which seeks to achieve the best clients' clinical outcome, whilst the laboratory focus is on a pre-established, protocol-based clinical outcome which seeks to rapidly return the client to a stable medical condition. One of the common themes related conflicting priorities and goals was the notion that nurses did not feel their sample requests were prioritized based upon the clinical urgency of the patient's situation. This led to a perceived lack of actioning of acute sample requests. Nurses used the laboratory turnaround time as a specific example of how their sample request priority was not being met. They felt that the prescribed sample results they required for patients were not being returned in a timely manner. The concept of goal incongruence was evident when nursing activities such as specimen collection were deemed to have an impediment on the clinical care of the patient from a medical perspective. An example in the study was a request to collect a sputum sample for a non-urgent respiratory patient. The physician did not agree with the nurse's decision to delay treatment and patient ambulation and viewed it as a deprioritization of clinical care. The concept of role conflict was also evident in this situation. It was found that in order to address these issues, effective negotiation and communication between the two professions was imperative. [10]

4.3 Implementing technology solutions for seamless collaboration

It is very important to recognize the resources and effort that have been invested in finding new solutions to improve the collaboration between nursing and laboratory staff for the sake of the patients. The quality and safety movement has increased attention to this important issue. Technologies are being developed and implemented to enhance the effectiveness of communication between these two disciplines. One newly developed technology is the bar code medication administration system. This system requires the nurse to use the bar code to scan the patient's identification band and the medication, allowing greater assurance that the right patient is receiving the right medication at the right time. Although this technology is not a direct method of communication, it has the potential to directly impact patient safety and outcomes. In an indirect communication method, laboratory staff have successfully communicated the significance of critical values to nursing staff using the algorithms on the patient's EHR and an automated alert calling system. This automated system has the potential to minimize the telephone tag that often occurs with reporting critical values. With the algorithm system, the information about critical values will pop up for the nurses to read when they log into the EHR. This method will help eliminate conflicting priority in dealing with critical values, as well as the habit of interrupting a nurse who may be occupied with something else. [11]

5. Case Studies on Successful Collaboration

Collaboration in a critical care setting A 45-year-old man was transferred from a rural hospital to a tertiary hospital intensive care unit (ICU) with a diagnosis of a large intracerebral haemorrhage. The impact of the haemorrhage had caused the man to deteriorate rapidly, and the rural hospital ICU staff were unable to manage the patient's condition. The patient was transferred to the tertiary hospital in a critical state, with a GCS of 8. The nursing and laboratory role for this patient focused on provision of emergency care, prevention of further hemorrhage, ongoing assessment and prevention of secondary complications, and discharge planning. During the patient's care in the ICU, the collaborative roles of the nursing and laboratory staff were closely related and globally focused on the total care of the patient. The needs of the patient fluctuated, and frequent reassessment and management were required. This preventative care required careful monitoring and control of the patient's blood pressure, as any further increases in pressure could cause another bleed. Ongoing laboratory tests were utilized to assess the patient's coagulation status and to monitor and control the blood pressure. Measures to prevent Valsalva actions were also taken to reduce the likelihood of another bleed. The collaboration of the nursing and laboratory staff in these tasks was a success, as there were no further complications during the patient's ICU stay. [12]

5.1 Collaboration in a critical care setting

Another successful study in a critical care setting was conducted by Deloughery and a group of nurses on the management of blood transfusion in acutely anemic patients. The group of nurses had previous experience in medical research and was asked by an emergency medicine physician to investigate the use of blood transfusion to aid in the treatment of these patients. Anemia is a frequent and sometimes life-threatening problem for many patients in the emergency department. With the use of stored red blood cells and physician orders, many patients were inappropriately transfused with stored cells in the past. The study aimed to compare the transfusion of stored cells to the use of erythropoietin and transfusion of fresh blood in hopes of finding an alternative method that would be more beneficial to the patients. The study was funded by a grant provided by a national organization that oversees blood products and was later published in a medical journal. This research not only provided an improvement in patient care at the local level but also made a what can be seen as a huge policy decision in the best practice for transfusing blood in patients with chronic anemia.

Casey and a group of nurses conducted a study on the role of medical imaging in decision making in a level 1 trauma center for over a period of 6 months. The trauma center that was studied had many positive characteristics that facilitated the collaboration between the laboratory and nurses. There existed a flat organizational structure that provided easy access to all members of the healthcare team to the key decision makers, and policy changes could be easily implemented. This previous situation was in contrast to other studies that showed hospital staff frustration with the inability to provide input on policies that may biasedly affect them. Not only was the trauma center an ideal site for the study, using ethnographic research method, a complete understanding of the role of collaboration between the laboratory and nursing to deliver high quality patient care was obtained.

5.2 Collaboration in a primary care clinic

After attending several sessions of the Quality Colloquium at the University of Pittsburgh, Dr. M. Michael Shabot felt it was time to put new ideas about quality improvement into practice. With competitive urging from colleagues in the nursing profession and administrative support, a research project on nurse-physician collaboration in a primary care clinic was conceptualized and implemented. The research is based on the hypothesis that nursing practice mechanisms based on the nursing profession's social mandate will foster environments in primary care clinics that are conducive to patient-centered nurse-physician collaboration. In turn, such collaboration will enhance clinical decision making, patient outcomes, and the professional practice satisfaction of both nurses and physicians. The research project tested an enriched model of nurse practitioner care based on the McGill nursing model (Artinian and Smith, 1997), compared with the extant model of physician care augmented by the conventional model of registered nurse care. The mixed method research consisted of components of survey and questionnaire administration, qualitative methods, and patient care outcome tracking over the course of two years. Due to the complexity and multiple characteristics of the research, the following three case studies will examine various aspects of nurse-physician collaboration and the impact on patient care outcomes. Each case study provides an opportunity to assess the competing model of care and examine the interactions that shaped the ultimate patient care outcomes. [13]

5.3 Collaboration in a research institution

Published studies have demonstrated a general improvement in the collaborative relationship between nurses and laboratory professionals in varied settings. These studies confirm that good communication and a clear understanding of each other's roles are the foundation of an effective relationship. Fischer and Walker (1995) identify a direct positive relationship between the quality of preanalytical information and specimen quality. This resulted in greater satisfaction with the laboratory service by nursing staff. A study by Hall, McCormack, and Merbitz (1986) examined a laboratory redesign at an acute care hospital. The change was done by creating a number of smaller laboratories located near the hospital wards they serviced. Hall et al. outlined the positive qualitative and quantitative outcomes following the redesign. These included better working relations with nursing staff, easier access to doctors, quicker turnaround times, and a reduction in the need for sample recollection. Another study by Cote and Collin (1999) looked at a patient identification system for specimens being sent to the laboratory from a geriatric and psychiatric institute. They found that the implementation of a patient ID bracelet system resulted in a significant decrease in incomplete, incorrect, or contaminated specimen samples. Each of these studies provides evidence for improvement over a current system and can be influential to whether it is a healthcare provider or laboratory staff initiating the change. Demonstration of potential benefits to changes is valuable in influencing changes to policies, procedures, and may even involve physical rebuilding or remodeling. [14]

6. Impact of Collaboration on Patient Care Outcomes

Error prevention will be most effective when lab professionals and nurses have established cooperative relationships and are comfortable conferring with one another. By communicating and proactively working to elucidate existing questions concerning a diagnosis, treatment, or test result, nurses and lab professionals are more likely to share, and thus decrease, the potential mistakes in judgment that could negatively impact patient care.

A recent report from the Institute of Medicine has drawn attention to the frequency of medical errors in healthcare and their impact on patient outcomes. According to the report, medical errors represent one of the leading causes of mortality in the United States. In a study relating to the prevention of medication errors, laboratorians and nurses were found to identify and prevent potential adverse events by using the laboratory data to monitor patient responses to medication therapy. This represented an improvement to the patient's treatment regimen and decreased the likelihood of an adverse event occurring.

A compelling body of research indicates that collaborative practice between professions in healthcare enhances the quality of patient care. Laboratory scientists and pathologists offer vital information that helps in recognizing and treating a patient's condition. When nurses' collaboration with the clinical laboratory is optimized, the effectiveness of clinical decision making and the efficiency of delivering that information is translated into positive patient outcomes. Improved quality of care is the desired result of a collaborative practice between the clinical laboratory and nursing personnel.

6.1 Reduction in medical errors and adverse events

In a study conducted in an acute care setting in Perth, Australia, laboratory services were directly involved in error prevention. The aim of the study was to measure the impact of pathology services on the clinical decision-making process and the resulting patient outcomes. Laboratory services provided clinical consultations and feedback on appropriate test ordering to the nursing staff. This resulted in a reduction of 50% in the pathology testing error rate from 4.2% to 2.1% of the total tests requested. The study showed that the relative risk of a patient having an adverse event associated with a pathology testing error was reduced by 55% (RR 0.45). This demonstrated that laboratory services' involvement in the nursing decision-making process for test ordering has a significant impact on reducing testing errors and patient adverse events. It is quite common for a patient medication error to occur during the administration of medication. Often it may be because the patient has not taken a particular drug before and is unsure of what it looks like or its name. If a patient is aware of the drug they have been administered and how it should affect them, they can notify a nurse if an incorrect drug or dose has been administered. In a study conducted in a 700-bed teaching hospital in Taiwan, an inpatient nurse drug administration error rate was compared before and after the introduction of a barcode system. The drug administration error rate decreased from 11.3% to 3.9%, and the rate of medication error with harm decreased from 2.5% to 0.78%. The study showed a significant reduction in the medication error rate with the introduction of the barcode system. If a laboratory test has been correctly ordered and the results are accurate and rapidly available, it can also prevent a medication error by the physician changing the drug or its dose due to uncertainty of the diagnosis. [15]

6.2 Improved patient satisfaction and experience

Patient satisfaction has been linked to various aspects of care, including the understanding of and meeting patient needs, supporting patient autonomy, and providing education to patients. Consequently, patient satisfaction is believed to be one of the most important and commonly assessed indicators of quality of care. Laboratory tests are an integral part of the care process. Many tests have an immediate impact on patient care, with influences ranging from the diagnosis or exclusion of a disease state, the monitoring of a disease state, or the detection of a pre-clinical

condition. Research has suggested that accurate and timely delivery of test results greatly influences patient care and management, impacts the frequency of returning to or remaining under the care of a practitioner, and minimizes iatrogenic complications. Therefore, it is crucial to consider the importance of a well-defined service with clear test request protocols and two-way communication channels between the nursing and laboratory staff to determine the exact test requirements. An observational study looking into the delays of test results and their impact on patient care concluded that too often errors in the test ordering process led to unsatisfactory results. A delay in the administration of a test or a failure to perform the test invalidated a previous diagnosis, and in some cases, the patient had to be readmitted to the hospital. Many nursing error studies would agree that often the cause of error is not a failure to do the right thing, but rather a result of doing the right thing in the wrong way. In all of these cases, it is the patient who suffers the consequences, and it is these unsatisfactory results that are a continued source of guilt and stress for the nurse involved. Access to specific laboratory test information enables the nurse to see what has or has not been done without having to look for the results. If a patient has been referred to a nurse because of an abnormal test result, the nurse may not know the specifics of the test and could administer another test, causing the patient's concern and leading to more unsatisfactory results. This situation can be avoided if the nurse has knowledge of the tests available and what specific tests have been performed, which may prevent a patient from being admitted to the hospital just so a test can be done. This occurred in a case where a patient had been taking an anticoagulant and had an under skin hematoma. The plan was to observe the hematoma and redo the blood test every couple of days; however, the patient was admitted every time the nurse attempted to find the results. [16]

6.3 Enhanced quality of care and patient outcomes

Importantly, the data in some regions will be correlated with improvements in patient outcomes. A large cohort study in South Thames (UK) demonstrated that patients managed in medical services with fully integrated clinical nurse specialist and nurse practitioner posts had significantly reduced length of stay in hospital (Hutchinson et al., 2004). The impact of health professional interactions on patient outcomes was also investigated by Schaad et al., who studied the efficacy of treatment for acute pediatric respiratory infection (Schaad et al., 2002). The effectiveness of the use of a new rapid diagnostic test for group A streptococci (leading to more appropriate antibiotic use) was 30% in usual care, whereas the effectiveness of use in the nurse-administered protocol and the physician protocol was 90% and 100%, respectively. These improvements in systemic processes of care have recently been reviewed and compiled. Academic centers are encouraged to report the methods used to modernize the care for a particular disease resulting in better patient outcomes (Wasson et al., 2002). While the literature supporting its significance is compelling, it is perhaps more self-evident that correct patient outcome is often the result of a successful diagnosis and treatment pathway as described by the following two case illustrations. [17]

7. Conclusion

A laboratory is a supporting service, although it is not visible to patient care, it determines a very large part of patient care. The increased complexity of patient care has brought an increased dependence of nursing on laboratory services. Nurses assess laboratory results every day. The reliability and accuracy of those results dispose a risk or benefit to the patient. Collaboration can be fostered by promoting a greater mutual understanding of respective professional roles. This will not only lead to an improvement of patient care but will also give nursing and laboratory staff a sense of value of their contribution to patient care. This should create a healthy foundation for future collaborative efforts.

From the very initial stage of this paper, it was very clear that the importance of collaboration between nursing and laboratory staff is of paramount importance. Nursing and laboratory staff are two professions that depend heavily on each other. They must communicate and cooperate with

each other to achieve a common goal, which is the improvement of patient care. In order to achieve this goal, there must be an understanding of each other's roles and clear defined goals of how the collaboration will be carried out. The professional relationship between nurses and laboratory staff should be similar to that of a team. This team would consist of healthcare professionals working with common goals.

7.1 Summary of the importance of collaboration

The importance of these interactions and resultant collaborative practice has the potential to greatly enhance patient care and clinical outcomes. An example is a trial conducted by Weber et al (2007). Their aim was to assess whether collaboration between the discipline of nursing and the laboratory in heparin management could lead to improvement in the activated partial thromboplastin time (APTT) control of the patient, a widely accepted parameter that impacts on the incidence of thrombotic and hemorrhagic events. This study was conducted at six university medical centers in the United States.

Interactions between the discipline of nursing and laboratory occur primarily in the critical care areas of healthcare. An example at a macro level is the introduction of point of care testing (POCT) where it has been suggested that the relative greater involvement of nursing in decision making at the practice and management level, the closer interaction between nurses and laboratory staff and reciprocal lessons in clinical and laboratory practice may render the setting more fertile ground for productive collaboration. POCT by nurses has been identified as the primary stepping stone for collaborative practice between the two disciplines. Other examples at a micro level may include a nurse phoning the laboratory for an urgent result and the further clarifying the pre-analytical requirements for testing.

Introduction: Collaboration is an essential element in defining the quality of care provided to patients. It has been identified as a facilitator of best practice in multidisciplinary care and is seen at a clinical level in many areas of the healthcare sector. The collaborative relationship between the discipline of nursing and the laboratory is one that is not widely recognized or accepted yet has the potential to lead to improved clinical outcomes across the remit of healthcare. In the analytical model of collaborative working, there is an indication that the relationship between two professions or disciplines should result in the interaction which then leads to changes in practice, which is the resultant improvement on patient care and the final goal.

7.2 Recommendations for fostering collaboration in healthcare

There are several ways to foster collaboration between laboratory and nursing staff. Some of these include joint inservice education, cross training, formation of a quality improvement team, and redesign of the testing process. The laboratory and nursing staff can learn much from each other when they come together in an educational setting. Joint inservice can be designed to meet the needs of both groups so that they can gain a better understanding of each other's roles. Topics may include disease specific processes, specimen collection and identification, and understanding of laboratory tests. Cross training is also an effective way for each discipline to learn about the other. This can be as simple as laboratory staff teaching proper phlebotomy technique to nursing staff and as complex as a nurse becoming a certified diabetic educator by attending classes taught by the laboratory staff. When both groups have a better understanding of what the other is trying to accomplish, they can work together more effectively to reach common goals. [18]

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