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**INFORMATION PROFESSIONAL  
AT THE POINT OF CARE:  
CLINICAL LIBRARIAN SERVICE  
IN NEUROCRITICAL CARE**

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**Abstract**

*This paper documented the first clinical librarian service initiated in the Philippines. The role and experiences of the clinical librarian integrated in a multidisciplinary neurocritical care clinical team of a tertiary teaching hospital, and its effectiveness during the 6-month pilot was discussed. An evaluation of the pilot study was done using a questionnaire survey.*

**Introduction**

A clinical librarian (CL) is a member of a medical team who makes rounds in a hospital (Schacher, 2001). Aside from rounds, he also attends patient information conferences to identify information needs of physicians and other members of the health care team (Cimpl, 1985). In these settings, he provides evidence-based information to the members of the clinical team (i.e., physicians, nurses, clinical pharmacists) directly at the point of care, at the time they need it the most. The information provided by the CL in the form of evidences from the medical literature aims to assist the clinical team in deciding appropriate interventions.

The first clinical librarian program was started by Gertrude Lamb at the University of Missouri at Kansas City School of Medicine in 1971 (Schacher, 2001). Following Lamb's initial program, the National Library of Medicine provided funding to support several CL initiatives (Harrison & Beraquet, 2009). Between 1971 and 1981, there were 22 CL programs initiated in U.S. hospitals and academic libraries (Cimpl, 1985). However, financial constraints during the 1980's in the U.S. resulted in the cessation of many CL programs (Winning & Beverley, 2003). And by 1993, there were 29 CL programs identified in the U.S. (Winning & Beverley, 2003). At present, some academic medical centers and medical schools in the U.S. continue to employ clinical librarians.

Aside from the U.S., there is also a number of CL programs in other countries. The first program in the U.K. was initiated by Jean Farmer in the 1970's (Harrison & Beraquet, 2009). In Australia, a prospective study was initiated by Sladek, Pinnock and Phillips (2004) wherein an informationist was deployed in a teaching hospital. This was followed by a feasibility study of an informationist model in an Australian teaching hospital (Sladek, Pinnock, & Phillips, 2004).

Previous studies were made on CLs in intensive/critical care units. The study of Schnall and Wilson (1976) evaluated an 8-month trial program in the neonatal ICU in their institution. Veenstra and Gluck (1992) evaluated the effectiveness of a CL program in the medical and coronary ICUs in a teaching hospital. And Dee, Markwell, Bridges, Bandy, & Brandes (2007) detailed the results of a CL rounding with the multidisciplinary rounds team of the hospital's ICU.

This paper presents the pilot project which aimed to develop the role of a clinical librarian service (CLS) for the neurocritical care unit (NCCU) of St. Luke's Medical Center-Quezon City in primarily providing an on-demand, current, case-specific, and easy access information to help integrate in the daily practice of acute neurological and neurosurgical diseases management. Specifically, it aimed to determine: (a) the estimated time saved by the CL in information searching for the clinical team; (b) the total number of literature searches requested during the project; (c) the purposes of the literature search requests of the clinical team; (d) the problems encountered by the CL; and (e) the impact of the information provided to the clinical team by the CL on quality patient care.

## Methodology

In mid-February 2013, the neurointensivist (GSLM) of the NCCU, who is also its chief, approved the pilot project of a CLS for the unit. The project lasted for six months, which started from March 1, 2013 and lasted until August 31, 2013. The CL (MAAS) was stationed in the NCCU, with the neurointensivist as his direct supervisor. The clinical team in which the CL was assigned was composed of the neurointensivist, a neurocritical care fellow, internal medicine and neurology residents rotating in the unit, NCCU nurses, and clinical pharmacists assigned in the unit.

The CL was scheduled to be in the NCCU for the daily morning rounds, excluding weekends and holidays. Each search request regarding a specific topic related to patient care and researches sanctioned by the neurointensivist was received and collected by the CL. The CL then performed literature search after the rounds, selected the most pertinent and relevant articles, and delivered the retrieved articles to the requesting clinical team member via e-mail. Aside from the daily morning schedule of the CL, he was available for consultation through phone and e-mail, twenty-four hours, seven days a week.

The CL recorded the number of search requests made each month and the time spent for each search. After delivery of search results for each search request from a clinical team member (excluding the neurointensivist), an evaluation form was given to the requester. The questions used for the evaluation form were based on the study by Vaughn (Vaughn, 2009).

## Results

### *Overview of work with the NCCU*

The CL attended the daily morning multidisciplinary rounds with the NCCU clinical

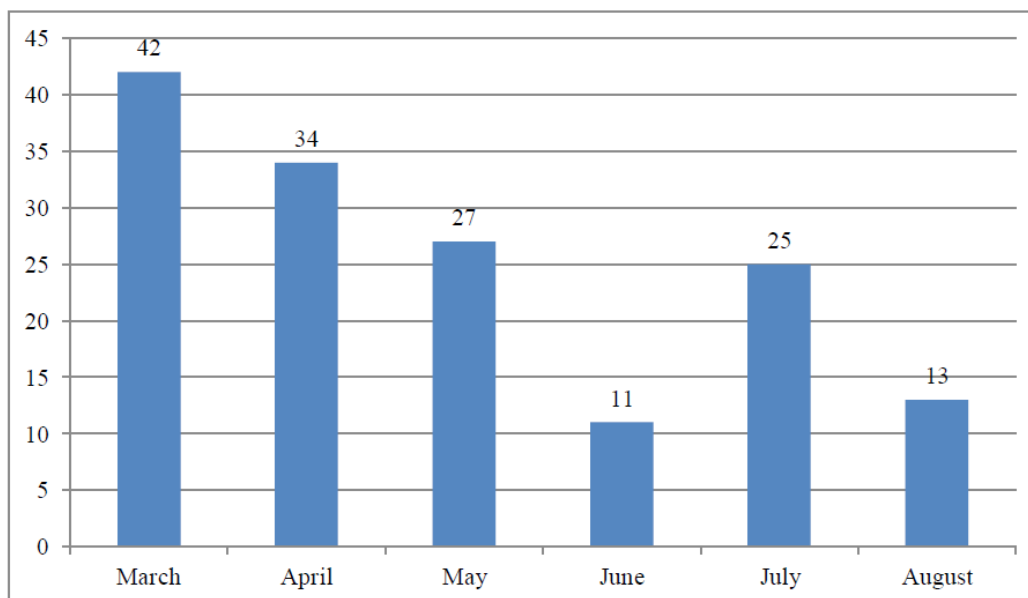
team. The CL took notes regarding the discussions made during multidisciplinary rounds and other information relevant to the current medical management of each patient admitted in the unit (e.g., current working diagnosis, results of diagnostic workups, history of present illness, etc.). This was done to assist the CL in understanding the current clinical status of each patient admitted in the NCCU and to facilitate retrieval of information resources which are closely relevant to the clinical status of individual NCCU patients.

Mediated literature search and document delivery requests were received by the CL during rounds and at times when he is not in the unit, through mobile phone or e-mail. The information resources provided by the CL were in the form of full-text articles and abstracts; mostly narrative reviews, clinical practice guidelines, meta-analyses, and systematic reviews. The CL attended some of the scheduled lectures by the residents and the neurointensivist in the NCCU. Lectures were also given by the CL, specifically on strategies in medical literature searching, and utilizing Medical Subject Headings in searching. The CL coordinated with the residents in the preparation and set-up of scheduled online medical lectures/seminars for the NCCU team as approved by the neurointensivist, as part of their continuing professional education activities.

#### ***Time spent by the CL in the NCCU for rounds, lectures, etc.***

The CL was present in the NCCU for the daily morning rounds during weekdays, from 8:00 A.M. until the end of the rounds or the scheduled reports. The CL spent one hour to five hours in the NCCU, with an average of about two hours and 20 minutes.

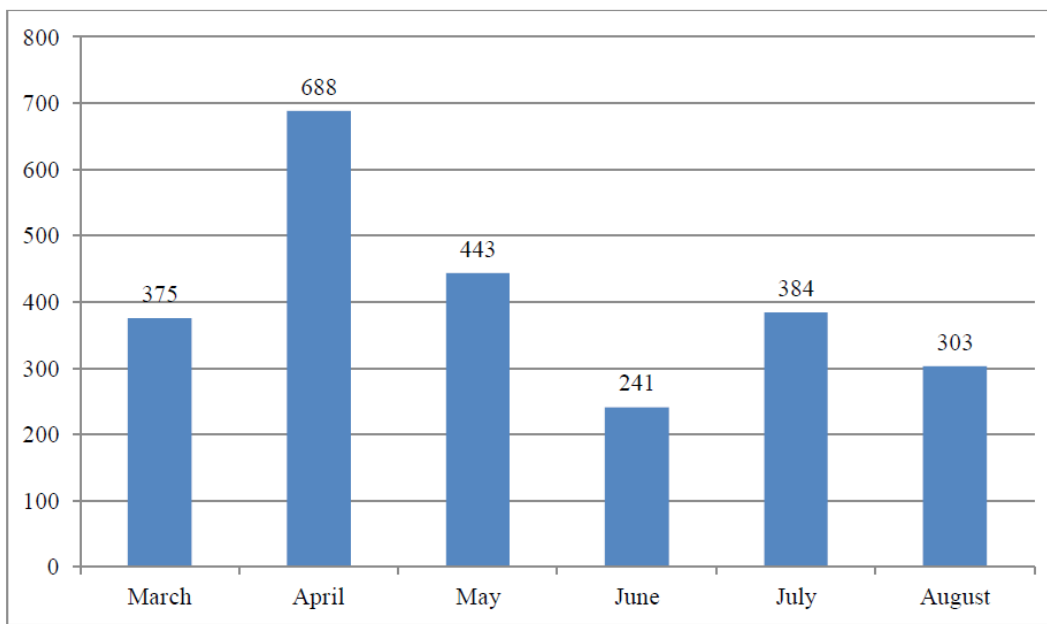
#### ***Number of mediated literature search requests per month***



*Figure 1. No. of mediated literature search requests per month*

Throughout the project, the CL has received 152 mediated literature search requests, with an average of 25 requests per month. As shown in Figure 1, the most number of requests were received in March – the first month of the project. Most of the requests came from the neurointensivist, followed by the residents, the neurocritical care fellow, and the NCCU nurses.

#### ***Number of articles retrieved per month***



*Figure 2. Number of articles retrieved per month*

As shown in Figure 2, the CL has retrieved numerous articles in response to the search requests received every month. Throughout the project, the CL has retrieved a total of 2,434 articles, with an average of 405 articles per month. These were searched and retrieved through various electronic databases available online, such as PubMed/MEDLINE, and from subscribed electronic databases of the medical library of St. Luke's College of Medicine.

#### ***Time spent by the CL for mediated literature searching per topic***

For each mediated literature search request, the CL spent five minutes to four hours and 50 minutes, with an average of approximately 50 minutes.

#### ***Result of evaluations by the clinical team members***

After each mediated literature search request from the fellow, residents, and nurses, the CL provided an evaluation form. The CL retrieved 16 answered evaluation forms for a total of 26 search requests, with a response rate of 61.54%.

Purpose	Frequency	Percentage
Patient care	11	68.75
Research	6	37.5
Continuing professional education	6	37.5
Others: Reports	3	18.75

Table 1. Purpose of mediated search requests (N = 16)

Note: multiple responses

The purposes of the search requests are: for patient care (68.75%), research (37.5%), continuing professional education (37.5%), and reports (18.75%), as shown in Table 1. The data presented in Table 2 shows that most of the respondents indicated an estimated time saved by the CL for doing the search for him/her for about one to three hours (37.5%), while for the rest of the requests, four to eight hours (31.25%) or more than eight hours (31.25%).

Purpose	Frequency	Percentage
Less than an hour	0	0
One to three hours	6	37.5
Four to eight hours	5	31.25
More than eight hours	5	31.25

Table 2. Estimated time saved by the CL as perceived by the respondents

As presented in Table 3, the information provided by the CL for all search requests made an impact on quality patient care (100%). Also in Table 4, data presented shows that the information aided the respondents in the choice of drugs for treatment (75%). For 10 search requests (62.5%), the information provided by the CL guided the respondent on the choice of other treatment methods. On seven search requests, the information helped in reducing the length of stay of the patients in the NCCU (43.75%). On eight instances (50%), the information assisted in the avoidance of adverse effects, such as patient mortality, surgery, and hospital-acquired infection. Also, the information guided the respondent in patient management on four instances (44.44%). On four occasions (25%), the information helped in the change of advice given to the patient. On three instances (18.75%), the information facilitated the respondent in the choice of diagnostic tests to be done for the patient. On two cases (12.5%), the respondents were aided in determining the diagnosis for the patient by the provided information. And, on one instance (6.25%), the information provided aided the respondent in evidence-based practices.

Response	Frequency (N = 16)	Percentage
Yes	16	100
No	0	0

Table 3. Impact in quality patient care of information provided by CL

Area	Frequency	Percentage
Choice of diagnostic tests	3	18.75
Choice of drugs	12	75
Choice of other treatment methods	10	62.5
Reduction in length of stay of patients	7	43.75
Change of advice given to the patient	4	25
Avoidance of adverse events	8	50
Others: Management	4	25
Others: Information for evidence-based practice	1	6.25

Table 4. Areas of impact of information provided by CL on quality patient care (N = 16)

Note: multiple responses

Table 5 shows that, in most search requests, the respondents were extremely satisfied with the information provided by the CL (68.75%) while the rest were very satisfied (31.25%).

Purpose	Frequency	Percentage
Extremely satisfied	11	68.75
Very satisfied	5	31.25
Moderately satisfied	0	0
Slightly satisfied	0	0
Not at all satisfied	0	0

Table 5. Satisfaction of respondents on the services of the CL

The comments regarding the respondent's overall impression of the CL's services were positive. Most of the comments indicated that the CL decreases the time spent for searching and retrieving information. In one comment, the respondent indicated that the CL is "helpful in providing information immediately within the day for patient care." And the other respondent stated that: "Having someone adept in research makes data readily accessible to everyone. It is like the clinical librarian guides the unit by providing evidence-based literature and input."

## Discussion

The number of articles retrieved and amount of time spent on searching for the articles depended on several factors. The amount of articles retrieved depended on the coverage in terms of publication year of the information needed and the study design and publication format preferred by the requester (e.g., practice guidelines only; systematic reviews and meta-analyses only; all publication/study types, including animal clinical trials and case reports). As for the time spent on mediated literature searching, it depended on: (a) the bandwidth speed of the internet connection used at the time of searching; (b) the coverage in terms of publication year of the information needed; and (c) the study design and publication format preferred by the requester.

Prompt retrieval of information resources is also partly dependent on the bandwidth speed of the internet connection used at the time of searching. Utilizing the WiFi connection available in the NCCU for literature searching was not a good option, since the bandwidth speed is frequently sluggish and intermittent. It made difficulties for the CL to rapidly retrieve the needed information while in the premises of the unit. Thus, the CL had to access the Internet from other facilities, such as the St. Luke's College of Medicine Medical Library, where bandwidth speed is faster and stable most of the time.

The availability of information resources, particularly articles from online journals in proprietary medical electronic databases, which were retrieved by the CL, depended on what the institution is currently subscribing. During the course of the pilot project, the medical library of St. Luke's College of Medicine has access to two proprietary databases. As with other electronic databases, not every article is available in one database alone. Though PubMed/MEDLINE and other free/open access databases available in the Web make available some full-text articles, there is still a necessity to access proprietary electronic databases from various publishers/aggregators. Some pertinent full-text articles searched by the CL were not available for access without subscription, thus only abstracts from PubMed/MEDLINE were provided as alternative. Also, accessing the databases available in the medical library is limited for on-site access only (within the network infrastructure of the hospital and the medical school). Thus, when the medical library is closed and/or the WiFi connection of hospital is sluggish and intermittent, the prompt retrieval of information resources from the databases is greatly difficult, if not, impossible to achieve within a short time frame.

Integrating with the NCCU clinical team was a steady, but slow process. At the start of the project, the NCCU clinical team was made aware of the purpose and role of the CL for the unit by the neurointensivist. Regardless of this, not everyone from the unit collaborated with the CL. As illustrated in Figure 3, the vast majority of mediated literature search requests were from the neurointensivist. This was followed by the residents and the neurocritical fellow, who from the previous months prior to the pilot project, has worked with the CL for her research projects and was fully aware of the role of the CL in the NCCU about a month before. The residents, whose turns change every month, made requests for mediated literature search usually for the preparation of lectures and reports to be presented in the unit. Not all of the residents who rotated in the unit requested from the CL. Only one nurse requested the CL for mediated literature search for his research project. There were no requests for the services of the CL from the clinical pharmacists of the unit.

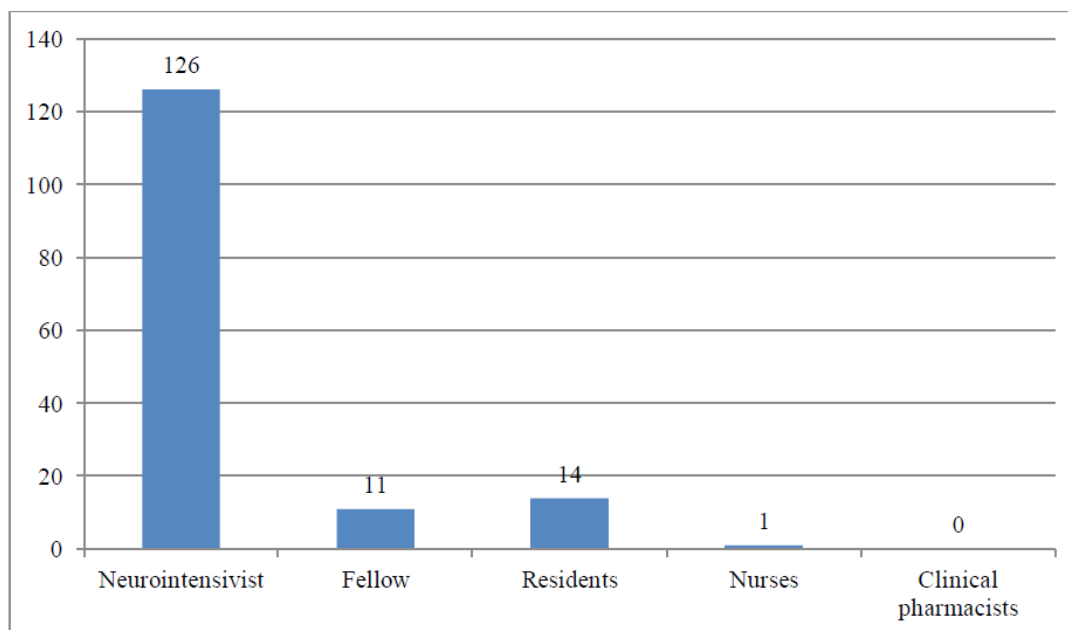


Figure 3. No. of mediated literature search requests according to NCCU personnel

### Conclusion

The services of the CL have provided a means for the NCCU clinical team to obtain quality-filtered and patient-specific evidence-based information which can guide them in the management of critically-ill patients, within the shortest period of time that they need it. Just by the mere presence of a CL within the unit gives an impression to the clinical team that there is a person who can be relied upon in assisting in obtaining the answers to clinical questions arising before, during, and after rounds. This kind of specialized information service ultimately benefits not the individual members of the clinical team, but the patients under the direct care and management of the clinical team, because they are assured that patient care strategies implemented by the clinical team are guided by the latest published evidences available in the medical literature.

### Recommendations

The clinical setting, especially in an intensive/critical care unit, is an uncommon area for a non-medical librarian to immerse. Providing embedded information services in the clinical setting requires more preparation in terms of the knowledge to be acquired by a prospective clinical librarian. Medical terminologies and concepts in the practice of medicine such as evidence-based practice and clinical research are common encounters in the clinical health care environment. Thus, there must be courses available in the undergraduate and/or graduate studies of library schools in the Philippines which can prepare future librarians to engage in clinical librarianship. Such courses may include: anatomy and physiology, medical terminology, epidemiology, basic pharmacology, and evidence-based medicine.

As for current practicing medical librarians who might be interested in implementing clinical



librarian service in their respective institutions, they must undertake an extensive training in medical literature searching and critical appraisal to provide mediated literature searching service directly at the point of care—an essential aspect of clinical librarian service. Acquiring such skills can provide them the credibility, as recognized by health care professionals, especially physicians, to become an integral member of the multidisciplinary health care team, providing quality patient care. In terms of equipment, they must utilize tablet computers and/or smartphones with access to PubMed/MEDLINE and other online medical information resources which their respective institutions subscribe to, in order to provide timely information sources as requested while attending hospital rounds, clinical meetings, case conferences, and other clinically-relevant forums.

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