

Use of the 2008 Basel Consensus Statements to Assess, Realign, and Monitor Pharmacy Practice at a Tertiary Care Hospital in Northern Uganda: Illustrative Case Study, Part 2

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INTRODUCTION

St Mary's Lacor Hospital (Lacor Hospital), located in the Gulu District of Northern Uganda, was founded in 1959 by a group of Comboni missionaries and was later developed and expanded by a Canadian surgeon, Dr Lucille Teasdale, and an Italian pediatrician, Dr Piero Corti.¹ The hospital grew from a 30-bed hospital to a 483-bed health care centre, providing care to about 500 inpatients and 800 outpatients daily. Lacor Hospital also supports and operates 3 peripheral 24-bed health centres, each about 10 km from the hospital, to serve the villages surrounding Pabbo, Opit, and Amuru. The hospital has become a training ground for various health care professionals, including students from the faculties of medicine and pharmacy and the midwifery programs of Gulu University, Makerere University, and Mbarara University. In addition, the Lacor School of Nursing and Lacor School of Laboratory Technology were developed within the hospital. In 2009, the hospital's executive team identified the need for the Department of Pharmacy to establish optimal strategies for logistical support and technical assistance with regard to medication management and pharmacy practice.

The challenges highlighted at Lacor Hospital parallel the vision of the World Health Organization (WHO) and the International Pharmaceutical Federation (FIP) of optimizing patient safety, utilizing health care resources responsibly, and ensuring the integrity of the medication supply chain.² In 2009, *Pharmaciens sans frontières* (also known as *Pharmacists Without Borders—Canada* or *PSF-Canada*) was contracted by the Teasdale-Corti Foundation and the Lacor Hospital executive team to provide pharmacy support, knowledge exchange, and technical assistance to the Lacor Hospital

Department of Pharmacy.¹ Two PSF-Canada pharmacists (including R.V.) conducted the initial on-site evaluation, which resulted in 24 recommendations aligned with the FIP's 2008 Basel Statements on the future of hospital pharmacy (Table 1). The recommendations presented by PSF-Canada served as an action plan for interventions and a guiding document for the PSF-Canada pharmacists and the Lacor Hospital pharmacy management team to achieve the vision of the 2008 Basel Statements for hospital pharmacy practice.

The 2008 Basel Statements consisted of 75 consensus statements reflecting a shared vision of the future practice of hospital pharmacy.³ The statements were developed in 2008 by an international consortium of 348 pharmacists, from 98 countries, at the 68th Congress of the FIP. The consensus statements were grouped under 7 themes addressing all areas of hospital pharmacy practice: overarching statements on the future of hospital pharmacy, medication procurement, influences on prescribing, preparation and delivery of medications, administration of medications, monitoring of medications, and human resources and training. The Basel Statements strive for a measure of agreement about the vision of hospital pharmacy practice across borders and across cultures. They have been used to assess or advance hospital pharmacy practice in many areas of the world, including China, Europe, the United States, Canada, Uruguay, the Western Pacific Region, and now Uganda.⁴⁻¹²

In May 2010, PSF-Canada deployed its first Canadian pharmacist (G.S.) to put the action plan into motion. Poh and others¹ published the first part of this illustrative case study, which described the process of utilizing the 2008 Basel Statements in assessing, realigning, and monitoring pharmacy practice at Lacor Hospital from 2010 to 2012.¹ Collaboration between

Table 1 (part 1 of 4). Status of PSF-Canada Recommendations (2011–2015)

PSF-Canada Recommendation	April 2011	June 2012	May 2013	September 2015
2009 recommendations				
Establish middle management positions within the Department of Pharmacy	In progress Pharmacy organizational chart being drafted.	Completed Designated manager established for pharmacy satellites.	Completed Ongoing accountability meetings and reporting will need to be formalized.	Completed
Develop a communication plan to inform clinicians about medication back orders and supply shortages	Completed Weekly or biweekly reports sent to prescribers.	Completed Inventory system reports generated with real-time data; information on new items or back-ordered medications disseminated, along with possible alternatives.	Completed Monthly pharmacy bulletins are sent to ward (hard copy and electronic) and physicians (electronic).	Completed Monthly pharmacy bulletins are sent to ward (hard copy and electronic) and physicians (electronic).
Create a buyer position within the Department of Pharmacy to support the procurement of medications and medical supplies	In progress Purchasing procedure being drafted.	In progress Recruitment of procurement officer under discussion with hospital administration.	In progress In discussion with senior administrator management. Formal proposal to be written.	In progress Person identified and will commence this function with pharmacist in near future.
Separate the accounting of medical supplies from medications	Completed Drug utilization report to be reviewed by Medicine and Therapeutics Committee.	Completed Medications and medical supplies recorded, computer-generated utilization reports now available based on category and location of use.	Completed	Completed
Update the drug accounting process to ensure accuracy of medication expenditures at St Mary's Lacor Hospital	In progress	Completed Drug and medical supplies expenditures now available for each ward or clinic.	Completed Ongoing system upgrade needed to integrate bar-coding system with current software.	Completed
Reinstate the Medicine and Therapeutics Committee	Completed Formulary under review.	Completed Ongoing formulary review and development of clinical guidelines for critical care, maternity and women's health, internal medicine, pediatrics, and surgery.	Completed Medication and Therapeutics Committee meets monthly. Clinical prescription guidelines published, and second edition to be updated.	Completed Medication and Therapeutics Committee meets monthly. Head pharmacist is secretary of committee. Clinical prescription guidelines published, and second edition to be updated.
Create a patient medication profile for inpatients and outpatients at St Mary's Lacor Hospital	In progress Ongoing discussions with information technology department.	In progress Ongoing discussions with information technology department.	In progress Hospital is reviewing and updating software that will include required patient data and outcome of therapy.	In progress ARV/OPD clinical pharmacy implemented, but not others. The hospital is reviewing and updating software that will include the patient's diagnosis, drug therapy, and outcome(s) of therapy.
Limit access to pharmacy stores to designated pharmacy staff	In progress	Completed Keys to pharmacy stores kept in secure location to which only authorized personnel have access.	Completed Locked cabinet with keys. Only restricted personnel in main stores.	Completed Locked cabinet with keys. Only restricted personnel in main stores.
Review the control of ward stock medications and supplies to avoid diversion	In progress Historical utilization statistics created.	In progress Wards have preprinted order sheets; monthly audits being conducted; ongoing audits to adjust stock levels.	In progress Initial historical utilization statistics have been created and maximum levels established for each ward and item. Ward tracking sheets have been developed.	Completed Pharmacy delivery of ward stock, and ward stock lists have been developed outlining maximum levels of stock (based on consumption data). Levels require continual evaluation.

continued on page 37

Table 1 (part 2 of 4). Status of PSF-Canada Recommendations (2011–2015)

PSF-Canada Recommendation	April 2011	June 2012	May 2013	September 2015
Utilize the e-learning program to train nurses and pharmacy staff on intravenous solution preparation	Not started Program being reviewed with nursing leadership.	Not started Program being reviewed with nursing leadership.	Not started Re-evaluation required by head pharmacist.	Not started Re-evaluation required by head pharmacist.
Upgrade the pharmacy sterile room to meet current practice standards	Not started Not cost-effective to prepare IV solutions locally.	Not started Recommendation discontinuation suggested.	Not started Not cost-effective to prepare IV solutions locally.	In progress Installation of laminar flow hood, complete with personal protective equipment.
Provide appropriate training to staff involved in preparation and administration of cytotoxic medications	Completed	Completed Dilution charts developed, ongoing quality assurance and training provided to meet international guidelines and standards.	Completed	Completed Only trained pharmacy personnel prepare cytotoxic drugs in room equipped with laminar flow hood, complete with personal protective equipment.
Reassess minimum and maximum levels for ward stock medications and medical supplies on the wards and in the pharmacy	In progress Performance indicators being developed.	Completed Testing of pharmacy and ward performance indicators.	Completed Ongoing maintenance needed to validate policy and keep levels updated.	Completed Ongoing maintenance needed to validate policy and keep levels updated.
Create a policy detailing minimum and maximum levels for ward stock medications	Not started	Completed Standard operating procedure completed and under review.	Completed	Completed
Increase control and access to ward stock medications on wards	In progress Ward stock checklist being developed.	In progress Ward ordering list rolled out to all wards.	In progress Pharmacy delivery of ward stock implemented on 3 high-volume wards. Ward stock lists developed.	In progress Ward inspection standard operating procedure updated, with biweekly ward checks performed by pharmacy staff member.
Assume responsibility for replenishment of ward stock medications	Not started	In progress Pilot pharmacy delivery of ward stock.	In progress Pharmacy delivery of ward stock implemented on 3 high-volume wards.	Completed Pharmacy delivery of ward stock to wards.
Review infection control procedures as they relate to the administration and dispensing of medications	In progress	In progress Infection manual completed, pending approval by hospital executive team.	In progress Infection control procedures/audit tools and checklist required for dispensing practices within the pharmacy.	Completed Ward-level infection control requires audits and reinforcement from nursing managers and quality assurance team.
Create a strategy to reduce prescription transcriptions at St Mary's Lacor Hospital	Completed	Completed	In progress	In progress Transcription is rarely required, as physicians already write orders directly on the medication administration form. Development of preprinted order forms for common diagnoses to be explored.
Procure smaller-volume parenteral products for pediatric patients	Completed	Completed	Completed	Completed Smaller-volume IV solutions are procured.
Implement a direct refill policy for outpatients at St Mary's Lacor Hospital	Not started	Discontinued	Discontinued	Discontinued Suggest to re-evaluate at a later date.
Conduct a cost-effectiveness evaluation of in-house, large-volume parenteral production	Completed Not cost effective to prepare IV solutions locally			
Create a medication cost-awareness program to inform clinicians about the cost of different medical therapies	Not started	In progress In discussion with administration to roll out clinical guidelines.	Completed	Completed

continued on page 38

Table 1 (part 3 of 4). Status of PSF-Canada Recommendations (2011–2015)

PSF-Canada Recommendation	April 2011	June 2012	May 2013	September 2015
Conduct a drug-use audit on high-cost medications to promote best prescribing practices at St Mary's Lacor Hospital	In progress Ceftriaxone DUE in pediatric patients under review.	In progress Presentation of results to staff; other DUE activities being developed.	In progress DUE completed for ceftriaxone on pediatric ward. Next DUE planned.	Completed Ongoing with periodic studies of medications. Projects to be given to pharmacy students or interns.
Create medical directives for allied health care professionals	Not started and discontinued			
2011 recommendations (new)				
Conduct an audit of drug administration to patients, to evaluate frequency and rationale for missing medication doses	NA	Completed Follow-up audit completed, medication administration form being revised.	Completed Ongoing audits required by quality assurance team with pharmacy support.	Completed Audits performed annually with results improving each time. There will be ongoing audits required by quality assurance team with pharmacy support.
Participate on the St Mary's Lacor Hospital Infection Control Committee	NA	Completed	Completed	Completed Lacor pharmacist is a member of infection control committee.
Establish a quality assurance program for nonsterile compounding	In progress	In progress Quality assurance guidelines being developed for nonsterile compounding.	In progress Nonsterile compounding manual has been updated. Plan for training in place.	Completed Nonsterile compounding manual has been updated; pharmacy personnel trained.
Collaborate with the Lacor School of Nursing to develop and deliver pharmacology sessions for nursing students	In progress Weekly pharmacology courses presented to nursing students since 2010.	Completed Pharmacists involved in teaching pharmacology courses at diploma and certificate level.	Completed Local pharmacists and interns are part of teaching team at nursing school. Most teaching now done by pharmacy interns.	Completed Pharmacists and pharmacy interns involved in teaching pharmacology courses. Most teaching completed by pharmacy interns.
Collaborate with Gulu University to implement and develop pharmacy training programs	In progress Proposal to establish the Pharmacy Program, and Curriculum Development workshops completed in 2010.	In progress Pharmacy technician certificate program developed and implemented.	Completed PSF-Canada pharmacists support Lacor head and deputy pharmacist with administrative duties associated with teaching activities at Gulu University.	Completed Lacor and PSF-Canada pharmacists assist with administrative duties associated with teaching activities at Gulu University. PharmD program to start in future, depending on human resources and funding.
2013 recommendations (new)				
Increase pharmacist and pharmacy intern presence and input at ward level and in outpatient areas	NA	NA	NA	Completed Significantly improved communication and collaboration with other health care professionals and administrative staff through the distribution of monthly pharmacy bulletins, presentations during continuing education, involvement in hospital committees, and increased presence on wards.
Develop a pharmacy consult trigger tool to target high-risk pharmacotherapy issues	NA	NA	NA	Completed Recommend this as a project for future interns or pharmacy students.
Evaluate the impact of clinical pharmacy activities (no. of interventions, time spent providing drug information, medication safety, patient safety, patient education)	NA	NA	NA	Not started

continued on page 39

Table 1 (part 4 of 4). Status of PSF-Canada Recommendations (2011–2015)

PSF-Canada Recommendation	April 2011	June 2012	May 2013	September 2015
Identify high-risk medications and develop strategies to increase safety of their use	NA	NA	NA	In progress High-risk medications identified in Parenteral Drug Manual 2015. Strategies to be developed.
Implement a system to monitor and report on product quality (medicines and medical supply)	NA	NA	NA	Completed Standard operating procedure for unserviceable condition reports developed September 2015; distribution of form to all wards and departments

ARV/OPD = antiretroviral/outpatient department, DUE = drug-use evaluation, NA = not applicable, PSF-Canada = Pharmaciens sans frontières Canada (Pharmacists Without Borders—Canada).

PSF-Canada and Lacor Hospital has been ongoing from 2009 to October 2015. The aim of the current article is to illustrate and highlight the actions taken and accomplishments achieved over a 5-year period, utilizing the 2008 Basel Statements to assess, realign, and monitor pharmacy practice.

PHARMACY ACTION PLAN

In 2009, 2 PSF-Canada pharmacist advisors (including R.V.) conducted an initial needs-based assessment. An original action plan was developed by PSF-Canada, in conjunction with the Lacor Hospital executive and pharmacy managers, consisting of 24 recommendations (Table 1). The aim of the action plan was to address and close the gaps between current and desired hospital pharmacy practice as envisioned by the 2008 Basel Statements (Table 2).

The first PSF-Canada pharmacist began working at Lacor Hospital in May 2010. In total, the mission consisted of 9 deployments of Canadian pharmacists over the period 2010 to 2015. The mission ended in October 2015. Seven PSF-Canada pharmacists were deployed for periods of 3 to 8 months. Once on site, each PSF-Canada pharmacist was presented with a work plan by the PSF-Canada mission leader, who was located in Canada. The plan included specific goals for the deployment that would advance the mission toward meeting the strategic goals of the PSF-Canada action plan. Every 1 to 2 weeks, the mission leader would connect with the on-site pharmacist, via social media, to review progress and reprioritize goals if required. Details of how each intervention was put into action were not documented, but annual assessments were performed.

To track progress, and to ensure continuity and momentum, the annual mission assessments were conducted annually or biennially from 2010 to 2015. For these assessments, each of the 2008 Basel Statements was ranked as met, partially met, not met, or not applicable. In addition, each of the PSF-Canada recommendations was ranked according to level of completeness

(not started, discontinued, in progress, or completed). After evaluation of each of the 2011 and 2013 assessments, 5 new recommendations were recognized and added to the PSF-Canada action plan, for a total of 10 new recommendations (Table 1). Each assessment was conducted by the PSF-Canada mission leader, the head pharmacist at Lacor Hospital, and the PSF-Canada on-site pharmacist. Each assessment included the following elements:

- formal and informal visits to the wards and departments within the hospital, including medicine, pediatrics, maternity, outpatient clinics for adults and children, HIV clinic, outpatient pharmacies (adult, children, private, and HIV clinic), main and inpatient pharmacy stores, IV preparation room, and pharmacy office
- information-gathering through formal and informal interviews
- review of pharmacy workflow processes, inventory management practices, audits, and student project status

Because of the potential for inter-rater bias and the lack of a specific definition for each ranking, the findings were validated through discussion with key individuals, including past PSF-Canada pharmacists and various staff members in the Lacor Hospital, including the executive director, institutional director, medical director, senior administrators, matron, assistant matron, and internal auditors. The presence of these key individuals allowed for consistency in assessment over the years.

INTERVENTIONS

The majority of the interventions undertaken to achieve the PSF-Canada recommendations, described briefly in Table 1, were implemented within the hospital's Department of Pharmacy. The implementation strategies to achieve each goal were at the discretion of the on-site PSF-Canada pharmacist, in conjunction with the PSF-Canada mission leader and the Lacor Hospital pharmacy team. Because of the advancement

Table 2 (part 1 of 4). Assessment of Pharmacy Practice St Mary's Lacor Hospital in Relation to 2008 Basel Consensus Statements*†

Statement	2012	2013	2015
Overarching statements			
1. The overarching goal of hospital pharmacists is to optimize patient outcomes through the judicious, safe, efficacious, appropriate, and cost-effective use of medicines.	Partially met	Partially met	Met
2. At a global level, "Good Hospital Pharmacy Practice" guidelines based on evidence should be developed. These guidelines should assist national efforts to define standards across the levels, coverage, and scope of hospital pharmacy services and should include corresponding human resource and training requirements.	Not applicable; requires a national-level assessment	Met	Met
3. The "five rights" (the right patient, right medicine, right dose, right route, and right time) should be fulfilled in all medicines-related activities in the hospital.	Met	Met	Met
4. Health authorities and hospital administrators should engage hospital pharmacists in all steps in the hospital medicines-use process.	Met	Met	Met
5. Health authorities should ensure that each hospital pharmacy is supervised by pharmacists who have completed specialized training in hospital pharmacy.	Met	Met	Met
6. The Chief Pharmacist/Director of Pharmacy should be the senior professional responsible for coordinating the judicious, safe, efficacious, appropriate, and cost-effective use of medicines in the hospital.	Met	Met	Met
7. Hospital pharmacists' authority over the medicine-use process should include authority over the selection and use of medicine-related devices such as administration devices, giving sets, infusion pumps, and computer-controlled dispensing cabinets.	Met	Met	Met
8. Hospital pharmacists should take responsibility for all medicines logistics in hospitals.	Met	Met	Met
9. Hospital pharmacists should serve as a resource regarding all aspects of medicines use and be accessible as a point of contact for health care providers.	Met	Met	Met
10. All prescriptions should be reviewed, interpreted, and validated by a hospital pharmacist prior to the medicine being dispensed and administered.	Not met	Not met	Partially met
11. Hospital pharmacists should monitor patients taking medicines (daily or whenever medicines are changed) to assure patient safety, appropriate medicine use, and optimal outcomes. When resource limitations do not permit pharmacist monitoring of all patients taking medicines, patient-selection criteria should be established to guide pharmacist monitoring.	Not met	Partially met	Partially met
12. Hospital pharmacists should be allowed to access the full patient record.	Met	Met	Met
13. Hospital pharmacists should ensure that patients are educated on the appropriate use of their medicines.	Met	Partially met	Met
14. Hospital pharmacists should provide orientation and education to nurses, physicians, and other hospital staff regarding best practices for medicines use.	Met	Met	Met
15. Undergraduate pharmacy curricula should include hospital-relevant content, and post-graduate training programs and specializations in hospital pharmacy should be developed.	Partially met	Partially met	Partially met
16. Hospital pharmacists should actively engage in research into new methods and systems to improve the use of medicines.	Partially met	Met	Met

continued on page 41

of the hospital's Department of Pharmacy, it became a location for both Canadian and Ugandan pharmacy students to complete rotations for their professional programs. The students completed projects that supported the Department of Pharmacy in achieving the PSF-Canada recommendations. Examples of student projects included updating the Parenteral Drug Manual, completing drug-use evaluations, completing clinical intervention investigations, and developing standard operating procedures used to train staff in handling cytotoxic

drugs. In 2011, a pharmacy certification program was instituted under the auspices of the Gulu University Faculty of Medicine. Through this accomplishment, Lacor Hospital became one of the training centres for the pharmacy technician certification and diploma programs. Details of these accomplishments are presented under "human resources and training" in Table 3.

To aid in the sustainability of procedural interventions, standard operating procedures were developed for specific processes, such as ward inspections and completion of unserviceable

Table 2 (part 2 of 4). Assessment of Pharmacy Practice St Mary's Lacor Hospital in Relation to 2008 Basel Consensus Statements*†

Statement	2012	2013	2015
Medicines procurement			
17. The procurement process must be transparent, professional, and ethical to promote equity and access and to ensure accountability to relevant governing and legal entities.	Met	Met	Met
18. Procurement should be guided by the principle of procuring for safety.	Met	Met	Met
19. Procurement of pharmaceuticals is a complex process that requires pharmacist control and technically competent staff.	Met	Met	Met
20. Operational principles for good procurement practice should be regularly reviewed and procurement models adapted to fit different settings and emerging needs in the most appropriate and cost-effective way.	Met	Met	Met
21. Procurement must be supported by strong quality assurance principles to ensure that poor quality medicines are not procured or allowed into the system. Proper storage to ensure maintenance of quality in the whole supply pipeline is mandatory.	Met	Met	Met
22. Procurement should not occur in isolation, but rather be informed by the formulary selection process.	Met	Met	Met
23. Good procurement must be supported by a reliable information system that provides accurate, timely, and accessible information.	Met	Partially met	Met
24. A formal mechanism must be in place for pharmacists to request designated funds to procure medicines for their patients.	Met	Met	Met
25. Each pharmacy should have contingency plans for medicines shortages and purchases in emergencies.	Met	Met	Met
Influences on prescribing			
26. Hospitals should utilize a medicine formulary system (local, regional, and/or national) linked to standard treatment guidelines, protocols, and treatment pathways based on the best available evidence.	Met	Met	Met
27. Hospital pharmacists should be members of pharmacy and therapeutics committees to oversee all medicines management policies and procedures, including those related to off-label use and investigational medicines.	Met	Met	Met
28. Hospital pharmacists should have a key role in educating prescribers at all levels of training on the access to and evidence for optimal and appropriate use of medicines, including the required monitoring parameters and subsequent prescribing adjustments.	Partially met	Partially met	Met
29. Hospital pharmacists should be involved in all patient care areas to prospectively influence collaborative therapeutic decision-making.	Partially met	Partially met	Partially met
30. Hospital pharmacists should be an integral part of all patient rounds to assist with therapeutic decision-making and advise on clinical pharmacy and patient safety issues.	Not met	Not met	Partially met
31. Hospital pharmacists should provide continuity of care by transferring patient medicines information as patients move between sectors of care.	Not met	Not met	Not met
Preparation and delivery of medicines			
33. Hospital pharmacists should ensure that proper storage conditions are provided for all medicines used in the hospital.	Met	Met	Met
34. Hospital pharmacists should assume responsibility for the appropriate labelling and control of medicines stored throughout the hospital.	Met	Met	Met
35. Hospital pharmacists should ensure that compounded medicines are consistently prepared to comply with quality standards.	Met	Met	Met
36. Hospital pharmacists should provide pharmacy-managed injectable admixture services using aseptic technique.	Not met	Not met	Partially met
37. Hazardous medicines, including cytotoxics, should be prepared under environmental conditions that minimize the risk of contaminating the product and exposing hospital personnel to harm.	Partially met	Partially met	Met
41. Hospital pharmacists should implement systems for tracing medicines dispensed by the pharmacy (to facilitate recalls, for example).	Partially met	Partially met	Partially met

continued on page 42

Table 2 (part 3 of 4). Assessment of Pharmacy Practice St Mary's Lacor Hospital in Relation to 2008 Basel Consensus Statements*†

Statement	2012	2013	2015
Administration of medicines			
42. Hospital pharmacists should ensure that the information resources needed for safe medicines preparation and administration are accessible at the point of care.	Partially met	Partially met	Met
43. Hospital pharmacists should ensure that allergies are accurately recorded in a standard location in patient records and evaluated prior to medicines administration.	Met	Not met	Not met
44. Hospital pharmacists should ensure that medicines are packaged and labelled to ensure identification and to maintain integrity until immediately prior to administration to the individual patient.	Met in outpatient department	Met in outpatient department	Met in outpatient department
45. Where medicines are labelled for individual patients, full details to ensure safe administration should be included, for example, name of medicine, route, and, where appropriate, dose in mass and volume.	Met	Met	Met
46. Storage of concentrated electrolyte products (such as potassium chloride and sodium chloride) and other high-risk medicines on patient wards should be eliminated by dispensing ready-to-administer dilutions, or, if necessary, storing such products distinctly labelled in separate or secure areas.	Partially met	Not met	Partially met
47. Health care professionals responsible for administering injectable medicines and chemotherapy should be trained in their use, hazards, and necessary precautions.	Partially met	Met	Met
48. Doses of chemotherapy and other designated medicines (based upon risk assessment) should be independently checked against the original prescription by two health care professionals at the point of care prior to administration.	Not met	Partially met	Met
49. Pharmacists should ensure that strategies and policies are implemented to prevent wrong route errors, including, for example, labelling of intravenous tubing near insertion site to prevent misconnections, and use of enteral feeding catheters that cannot be connected with intravenous or other parenteral lines.	Not met	Not met	Not met
50. Vinca alkaloids should be diluted, ideally in a minibag and/or large syringe (for pediatric patients), and dispensed with special labelling precautions in order to prevent inadvertent intrathecal administration.	Not met	Not met	Met
52. Medicines not commercially available for neonatal and pediatric patients should be prepared by the hospital pharmacy.	Met	Met	Met
53. Standard concentrations of medicines should be determined, procured, and prepared for all patients, and especially for pediatric, neonatal, and critical care patients.	Partially met	Partially met	Partially met
54. Hospital pharmacists should be responsible for determining which medicines are included in ward stock and for standardizing the storage and handling of ward medicines.	Met	Met	Met
55. Hospital pharmacists should develop simple, rules-based approaches to advancing patient safety; for example, when a large number of dosage units are needed to give a dose (more than two tablets, vials, etc.), the prescription should be verified prior to administration.	Not met	Not met	Not met
56. Hospital pharmacists should ensure the development of quality assurance strategies for medicines administration, including the use of observation methodology to detect errors and identify priorities for improvement.	Partially met	Partially met	Partially met
57. The medicines administration process should be designed such that transcription steps between the original prescription and the medicines administration record are eliminated.	Met	Met	Met

continued on page 43

Table 2 (part 4 of 4). Assessment of Pharmacy Practice St Mary's Lacor Hospital in Relation to 2008 Basel Consensus Statements*†

Statement	2012	2013	2015
Monitoring of medicines			
58. A reporting system for defective medicines should be established and maintained to monitor and take the necessary action to minimize identified risks. Reports of defective or substandard medicines should be sent to regional or national pharmacovigilance reporting programs where these are available.	Not applicable	Not met	Met
59. A reporting system for adverse drug reactions should be established and maintained, and the necessary action should be taken to minimize identified risks. Reaction reports should be sent to regional or national pharmacovigilance reporting programs where these are available.	Met	Met	Met
60. A reporting system for medication errors should be established and maintained, and the necessary action should be taken to minimize identified risks. Reports of medication errors should be sent to regional or national medication error reporting programs where these are available.	Not met	Not met	Partially met
61. Hospital medication practice should be self assessed and data trended internally and compared with best practice in other institutions to improve safety, clinical effectiveness, and cost-effectiveness.	Partially met	Met	Met
62. Hospital medication practices should be reviewed by an external quality assessment accreditation program. Hospitals should act on reports following regular external quality assessment inspections to improve the quality and safety of their practices.	Partially met	Met	Met
63. Pharmacists' clinical interventions should be documented in the patient record. These data should be regularly analyzed to improve the quality and safety of medication practice.	Not met	Not met	Partially met
64. Trigger tools should be used to provide quantitative data on adverse drug events in the hospital. These data should be regularly reviewed to improve the quality and safety of medication practices.	Not met	Partially met	Partially met
65. Advanced clinical pharmacy services should manage medication therapy to optimize therapeutic outcomes. Outcomes data from such programs should be regularly reviewed and used to improve the quality and safety of medication practices. Examples include management of anticoagulation therapy, antimicrobial therapy, and therapeutic drug monitoring.	Partially met	Not met	Partially met
Human resources and training			
68. Hospital pharmacy human resource plans should cover all cadres and be linked to health targets. Such plans should describe strategies for human resource education and training, recruitment and retention, competency development, salary and career progression pathways, gender-sensitive policies, equitable deployment and distribution, management, and roles and responsibilities of stakeholders for implementation.	Met	Met	Met
75. The hospital pharmacy human resource evidence gap should be explored and addressed through a strategic research agenda.	Met	Met	Met

*The assessments for 2009 and 2011 can be found in part 1 of this illustrative case study (Poh et al.¹).

†The following 2008 Basel consensus statements did not apply or were not attainable during this PSF-Canada mission and are therefore omitted from this table: 32, 38–40, 51, 66, 67, 69–74.

condition reports. In addition to these documented standard operating procedures, the overall increased knowledge and experience of the current Lacor Hospital pharmacy and executive teams will aid in the continuity of interventions as well as the future improvement of procedures and education of staff. Significantly improved communication and collaboration with other health care professionals and administrative staff, through the distribution of monthly pharmacy bulletins, publication of the Parenteral Drug Manual, presentations during continuing education events, involvement in hospital

committees, and increased presence on wards, will aid in sustaining clinical knowledge and continuity of a higher level of pharmacy care and support for patients.

PROGRESSION OF PHARMACY PRACTICE AT ST MARY'S LACOR HOSPITAL

A quantitative analysis of progress in relation to the 2008 Basel Statements at Lacor Hospital is summarized in Table 4. From 2009 to 2015, the number of fully achieved (status of “met”) statements climbed from 18 (24%) to 44 (59%). In

Table 3. Major Accomplishments by the PSF-Canada Uganda Mission, 2010–2015

Area	Accomplishments and Highlights
Professional standards and communication	Significant improvements in interprofessional and interstaff communication and collaboration: <ul style="list-style-type: none"> • distribution of monthly pharmacy bulletins • pharmacy presentations during continuing medical education sessions • pharmacy department staff involvement in hospital committees • increased presence of pharmacy staff on wards
Inventory procurement and management	Local staff trained to independently complete the following activities with more precision: <ul style="list-style-type: none"> • perform daily inventory management • quarterly stock taking New computer work stations established in the pharmacies and pharmacy department Decline in inventory discrepancies for medical drugs and sundries over the past 5 years: in the past 2 years (FY 2013/2014 and FY 2014/2015), an international external auditor gave St Mary's Lacor Hospital a clean financial report and audit
Preparation and delivery of medications	Organization and streamlining of ward stock using preprinted ward order books Development of ward stock lists and audit tools Pharmacy delivery of medications and medical supplies to wards Development and implementation of standard operating procedures and training for cytotoxic drugs and nonsterile compounds Installation of laminar flow hood, complete with personal protective equipment
Prescribing and medication use	Revival of the Medicines and Therapeutics Committee: <ul style="list-style-type: none"> • published institutional clinical guidelines • implemented cost-awareness program • conducted a formulary review • quality improvement research such as drug prescription audits completed and continued • drug use evaluations performed and will continue The hiring of pharmacy technicians and the presence of the pharmacy interns have increased the presence of trained personnel in the pharmacies and wards
Administration of medications	Drug administration audits completed, with areas of improvement identified Parenteral Drug Manual, third edition (2015) complete for all injectable drugs used at St Mary's Lacor Hospital; manual distributed to wards, departments, pharmacies, and peripheral health care centres Quality assurance committee established
Monitoring and pharmacovigilance	Adverse drug reaction reports completed and reported regularly Standard operating procedure for unserviceable condition reports established; form distributed to wards and departments for use by all medical staff
Human resources and training	Middle management positions created for each of the pharmacy satellites Main pharmacy staffing increased: 1 receiver, 1 data entry clerk Two nursing aides completed the Ecumenical Pharmacy Network pharmacy certificate program Two to four pharmacy interns per year provide clinical and technical pharmacy support Collaboration with Gulu University Pharmacy Program: pharmacists are integrated into teaching of diploma and certificate students; students are sent to St Mary's Lacor Hospital and the 3 peripheral health care centres as part of their training Ministry of Health consults with pharmacy managers and Pharmaceutical Society of Uganda

FY = fiscal year, PSF-Canada = Pharmaciens sans frontières Canada (Pharmacists Without Borders—Canada).

Table 4. Quantitative Analysis of Status of Pharmacy Practice in Relation to the 2008 Basel Consensus Statements at St Mary's Lacor Hospital, Gulu, Uganda

Status	Year of Assessment; No. of Statements				
	2009 (Baseline)	2011	2012	2013	2015
Not applicable	18	16	14	13	13
Not met	25	15	12	13	4
Partially met	14	19	14	14	14
Met	18	25	35	35	44
Total	75	75	75	75	75

addition, 14 statements achieved the status of “partially met”, increasing the success of the mission. The number of “not applicable” statements was reduced from 18 (24%) in 2009 to 13 (17%) in 2015. Seven of the 13 statements ranked “not applicable” revolved around human resources and training and thus required national-level collaboration. That level of collab-

oration was beyond reach for the hospital and for this particular PSF-Canada mission.

The status of each PSF-Canada recommendation is detailed in Table 1. The original 24 PSF-Canada recommendations, which were the backbone of the PSF-Canada action plan, grew to a total of 34 recommendations, with the addition

of 5 new recommendations following each of the 2011 and 2013 assessments (as described above). Twenty-three of these 34 PSF-Canada recommendations were completed over 5 years, with another 6 currently in progress.

DISCUSSION

This illustrative case study supports the use of the 2008 Basel Statements for baseline assessment, as well as implementation and follow-up of interventions to meet the preferred vision of practice for hospital pharmacy. The vision of the Basel Statements parallels the FIP mission to “improve global health by advancing pharmacy practice and science to enable better discovery, development, access to and safe use of appropriate, cost-effective, quality medicines worldwide.”^{3,13}

Since their original dissemination in 2009, the Basel Statements have been utilized in both developed and developing countries to assess, advance, or implement hospital pharmacy practice.⁴⁻¹² For example, shortly after circulation of the 2008 Basel Statements, the Paraguay–Uruguay project was developed to implement the Good Hospital Pharmacy Practice plan of these 2 countries using the Basel Statements and the FIP vision as core influences to develop their strategic goals.⁵ In the Western Pacific Region, Penm and others^{6,7} have completed projects focusing on pharmacists’ influence on prescribing and validating a hospital medicines formulary, using surveys to validate the achievement of specific sections of the Basel Statements. Pharmacists in China have changed their vision of pharmacy practice, moving from a focus on drug products to an emphasis on caring for patients, consistent with the vision that emerged from the 2008 Basel Statements.⁸ The European Association of Hospital Pharmacists used the Basel Statements when developing its statements on hospital pharmacy practice.¹⁰ Most recently, Lyons and others¹¹ attempted to develop and pilot an assessment tool that institutions in a single country or across multiple countries can use to evaluate their pharmacies’ performance against the standards of the 2008 Basel Statements. In addition, the Basel Statements have been shown in both the United States and Canada to have a high degree of alignment with the standards of pharmacy practice of the American Society of Health-System Pharmacists and the Canadian Society of Hospital Pharmacists.¹²

The diversity in assessment and implementation techniques in different countries and regions demonstrates that medication safety requires commitment at the national, regional, hospital, pharmacy, pharmacist, and pharmacy technician levels. It also supports the FIP’s acknowledgement that it could not develop a simple “cook book” approach that could be applied in all settings.⁴ In September 2015, an updated version of the Basel Statements was launched, consisting of 65 statements.¹⁴ The revisions more closely align the statements with the WHO guidelines on good pharmacy practice and have a greater ability

to account for the diversity of settings in which these statements may be implemented.^{2,14,15}

This illustrative case study had 3 limitations. First, we were unable to assess the Lacor Hospital’s progress in relation to 13 of the Basel Statements (see Table 2). Eight of these 13 statements ranked as “not applicable” fall within the same theme, human resources and training. To achieve these criteria, a national-level assessment involving multiple stakeholders would be required, but such an assessment was not realistic for Lacor Hospital, nor was it within the scope of the PSF-Canada mission. The other 5 “not applicable” statements were related to areas that did not exist in or were not feasible for Lacor Hospital at the time, including enhanced pharmacy technology (e.g., unit-dose distribution systems) and investigational medications for research purposes. Second, use of the terms “partially met” and “in progress” to rank the status of the 2008 Basel Statements and the PSF-Canada recommendations, respectively, allowed inter-rater variability and subjectivity. In this case study, the assessors were the PSF-Canada mission leader and the on-site PSF-Canada pharmacist. The individuals holding these positions changed over time, which left room for different interpretations of the terminology at the time of assessment. Finally, the on-site PSF-Canada pharmacists were responsible for both the interventions to meet the prescribed goals and assessments of the outcome of these interventions, a situation that may introduce bias. Given the limited resources available for this PSF-Canada mission, seeking assessments from external or independent reviewers was not feasible. To overcome the potential bias, validation of the assessments was completed by many other key individuals, including past PSF-Canada pharmacists and St Mary’s Lacor Hospital staff members, such as the executive director, institutional director, medical director, senior administrators, matron, assistant matron, and internal auditors.

In addition to the first illustrative case study published by Poh and others¹ in 2013, other publications have described the use of specific sections of the Basel Statements to influence areas of hospital pharmacy practice.⁴⁻¹² However, to the authors’ knowledge, the current report is only the second descriptive study illustrating use of the majority of the 2008 Basel Statements as a framework to assess, realign, and monitor pharmacy practice in a tertiary care hospital. Given the recent updates to the Basel Statements, more documented use of the statements to assess and improve hospital pharmacy practice is required.

CONCLUSION

This case study illustrates use of the FIP’s 2008 Basel Statements to align a hospital’s goals for assessment, implementation, and improvement of hospital pharmacy practice. With the revisions to the Basel Statements that were released in 2015, more documented validation is required to verify the observations reported here. As recognized by the FIP, “It is important

that we take these statements beyond our own profession and make other healthcare colleagues aware of our aspirations. Furthermore, our administrators and politicians know that we have these standards and that we need their support to promote and implement them in the interest of patients.”⁴

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