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# **Observations and Recommendations Regarding Clinical Pharmacy and Pharmaceuticals at Rafidia Hospital and the Palestine Medical Complex**

**PALESTINIAN HEALTH SECTOR REFORM AND  
DEVELOPMENT PROJECT (FLAGSHIP PROJECT)**

**SHORT-TERM TECHNICAL ASSISTANCE REPORT (FINAL)**

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# ACRONYMS

D - Depth

EDL – Essential Drug List

H - Height

ICU – Intensive Care Unit

MD – Medical Doctor

MoH – Ministry of Health

NICU – Neonatal Intensive Care Unit

PICU – Pediatric Intensive Care Unit

PMC – Palestine Medical Complex

RH – Rafidia Hospital

RN – Registered Nurse

TPN – Total Parenteral Nutrition

USAID – United States Agency for International Development

W – Width

## **ABSTRACT**

The consultant is Director of Pharmacy Services at Loma Linda University Medical Center. He consulted for the USAID/Flagship Project in Ramallah from August 16 – August 31, 2010.

The consultant spent a significant portion of the consultancy evaluating the current status of pharmacy work flow as well as the medication management process throughout the Palestine Medical Complex (PMC), including the emergency department. The consultant provided technical advice to improve the workflow in the pharmacy. The consultant provided educational lectures for medical staff, residents, and nursing staff regarding medications used in pediatrics and in the intensive care unit (ICU), pediatric dosing methods, pediatric pharmacokinetics, rational antibiotic utilization, as well as a lecture about drug allergies and adverse drug reactions. In addition to the lectures, the consultant provided a significant amount of relevant resources which may be used to improve pharmaceutical care. The consultant also participated in morning report with the faculty and residents.

The consultant spent three days at Rafidia Hospital (RH) and evaluated their clinical pharmacy services, as well as the current status of pharmacy workflow and medication management throughout the hospital, including the emergency department. The consultant provided educational lectures for pharmacists and pharmacy students regarding the future role of a clinical pharmacist. The consultant met with physician leadership and discussed the impact of having a clinical pharmacist as part of the healthcare team.

A brief visit was also made to Alia Hospital in Hebron to assess the pharmacy services there.

During his visit, the consultant had the opportunity to meet with officials of the Ministry of Health to elicit their advice and support for his visit. Throughout his visit, the consultant had multiple discussions with the Flagship Project staff regarding the project, how to continue with assistance, and improve pharmacy services at RH and the PMC.

## SUMMARY OF RECOMMENDATIONS

The following recommendations are directed toward services and capabilities at the PMC and MoH institutions. Therefore, the implementation of the recommendations is ultimately the responsibility of the MoH and the hospital administrations. All the recommended actions, however, are feasible, inexpensive, and able to be accomplished with currently available resources. The Flagship Project is able to facilitate with its assistance and support.

1. Relocate the central pharmacy to a location which is more suitable for medication with regards to space and temperature control at PMC.
2. Increase the amount of shelving utilized to store pharmaceuticals as well as supplies distributed by the pharmacy (i.e. “disposable supplies”) at RH and PMC.
3. Rearrange staffing distribution to allow for a better balance of staff to workload ratio at PMC.
4. For both RH and PMC, increase the amount of pharmaceuticals in the ED to allow for faster initiation of care for urgent cases.
5. Place emergency guidelines with emergency trolleys to allow for an immediate reference for clinicians to use in code blue situations throughout PMC and RH.
6. Standardize the manner in which code blue situations are handled to allow for greater consistency for all staff involved in code blue situations at PMC and RH.
7. Establish guidelines and utilize standardized TPN order forms to allow for consistency between prescribers in the various specialties at PMC and RH.
8. Educate RNs on aseptic techniques for preparing parenteral medications, including TPNs.
9. Add distilled water to Essential Drug List (EDL) such that it is readily available and used for ICU/NICU patients on ventilators at PMC and RH.
10. Help both RH and PMC develop protocols, policies, and procedures for management of pediatric and neonatal patients.
11. Develop an interdisciplinary team among physicians, nurses, and pharmacists to ensure proper medicine management. Once the recommendations regarding pharmacy space and workflow are implemented, along with the impending implementation of the HIS, the HIS can be used to improve clinical services and enhance cooperation among physicians, nurses, and pharmacists in this regard.

## SECTION I: INTRODUCTION

The Flagship Project is a five-year initiative funded by the U.S. Agency for International Development (USAID), designed and implemented in close collaboration with the Palestinian Ministry of Health (MoH). The Project's main objective is to support the MoH, selected non-governmental organizations, and selected educational and professional institutions in strengthening their institutional capacities and performance to support a functional and democratic Palestinian health sector able to meet its priority public health needs. The Project works to achieve this goal through three components: (1) supporting health sector reform and management, (2) strengthening clinical and community-based health, and (3) supporting procurement of health and humanitarian assistance commodities.

This consultancy was to assess the current status of pharmacy services in RH and PMC. It also provided education to the clinical staff (MD, RN) in both of these institutions. The assessment was used to create recommendations to improve the status of pharmacy services in these MoH Hospitals.

This report contributes to Flagship Project Component 2, Objective 2.1: *Improving the Quality of Essential Health Services for Palestinians*. This consultancy also contributed to the MoH IDP module number 12, *Improve the Quality of Clinical Services in the Palestinian MoH Hospital System*.

## **SECTION II: ACTIVITIES CONDUCTED**

The consultancy included several tours of the pharmacies, nursing wards, and emergency department in the Palestine Medical Complex (PMC), Rafidia Hospital (RH), and Alia Hospital, with the goal of finding opportunities to improve pharmacy services throughout the system. Additionally, the consultant provided didactic and interactive education with the physician, nursing, and pharmacy staff at RH and PMC.

The consultant spent time with the head of pharmacy at the PMC, RH and Alia hospital. The specific processes to improve pharmacy services at each location were discussed thoroughly. The consultant provided a significant amount of relevant reference material and resources which can be immediately utilized and/or modified to fit the specific needs of each facility. These resources were provided to nursing and physicians at PMC and to the head pharmacists at RH and Alia hospital. The consultant spent time with each group, reviewed the resources and provided education on how to utilize the resources as effectively as possible.

## **SECTION III: FINDINGS, CHALLENGES, RECOMMENDATIONS, AND NEXT STEPS**

### **A. Findings**

#### **PMC & RH**

1. Medication management is relatively well organized on the wards.
  - a. Each morning, a copy of the patient medication profiles is sent to the pharmacy to fill a 24 hour supply of each medication for each patient.
  - b. Additionally, each unit has established par levels of medications which are intended to last 24 hours as an overstock in the event that a new admission and/or new medication order occurs.
  - c. Each unit is stocked only with the medications commonly used within that unit.
  - d. When medications dispensed to a unit are not utilized due to discontinuation of order and/or discharge of patient, the medications are not sent back to the pharmacy, leading to an overstock of pharmaceuticals on the ward.
    - i. The RNs and pharmacists try to offset this by not filling as much of those medications the next day.
2. Bulk supplies are donated in mass quantities and are stored in the pharmacy.
3. Pharmaceutical shipments arrive in 2 month increments.
4. The emergency department (ED) struggles with medication management.
  - a. Physicians do not always transcribe medications which they have ordered to be administered to patients, thus leading to gaps in documentation of why medications were utilized.
5. The ED has a significantly limited number of pharmaceuticals.
  - a. Patients with fevers are only given antipyretics and sent out with a prescription for an antibiotic.
  - b. After hours, when the pharmacy is closed, patients must then wait until the next day to start the treatment of their infection, leading to increased risk of progression of the infections.
  - c. Injectable diclofenac is the drug of choice of analgesia, when analgesia is utilized.
    - i. Trauma cases and fractures are not always treated with analgesia, and diclofenac is often not sufficient to manage the pain due to such cases.
  - d. Actual treatment of illness is often not initiated until the patient is admitted. This can be ill-advised for certain emergent and rapidly progressive conditions, for example acute appendicitis.
6. Lack of Sterile Water – There was no sterile water in either RH or PMC for use in humidifying ventilator circuits or isolettes.
7. Clinical Laboratory Services – Laboratory services are available inconsistently. It is difficult for the clinical care team to obtain laboratory values (drug levels, electrolytes) during non-daylight hours.

8. Policies and Protocols – There does not appear to be any written policies or protocols for managing code blue situations.
9. Nursing staff are knowledgeable about how to properly measure out and admix the various ingredients of TPNs.
  - a. There is no designated area for TPNs to be compounded on the nursing wards.
10. There is a lack of resources available which may be utilized to provide safer and more efficient pharmaceutical care.
11. Continuing education is not required for health care providers in Palestine.
  - a. Many clinicians go by what they learned in school and/or what they learned on the job.
  - b. Pharmaceutical representatives serve as a major source of drug information.

### **PMC**

12. Medication and supply storage within the central pharmacy is quite disorganized, leading to difficulty in finding supplies and medications, especially after the large bi-monthly shipment arrives.
13. The pharmacy does not have direct access to a ramp or dolly to bring in bulk items when they arrive.
  - a. A large window is used to bring supplies into the pharmacy.
  - b. Due to the inefficiency of utilizing this window as a primary means of bringing supplies into the pharmacy, many pharmaceuticals and supplies remain outside for several hours and even days because of the amount of time required to bring them in through this window.
14. Medications and supplies are often stored outside in the sun and/or rain, especially when the bi-monthly shipment arrives, leading to concerns about stability and security of medications.
15. Temperature control for pharmaceuticals is lacking. The central pharmacy lacks air conditioning, thus leaving the medications to be exposed to temperatures far above the recommended temperatures under which medication stability requires (This is especially true for the summer months).
16. Refrigerated medications are stored in the hospital kitchen, among other places throughout the hospital, due to lack of refrigerator space within the central pharmacy.
17. Many medications and supplies remain in the cardboard boxes which they are shipped in and are stacked floor to ceiling.
  - a. This can be quite dangerous if the supplies tip over (a stack of approximately 10 boxes of toxic and flammable medical gases was observed & was not secured from tipping over).
  - b. This can make it difficult if the required supplies are on the bottom of the stack.
  - c. This may make it more difficult to locate supplies since boxes are stacked based on where they fit, rather than an organized sequence.

18. Pharmacy staff works in a space insufficient to perform their tasks in an effective manner, and under temperatures of greater than 40 degrees Celsius within the pharmacy during the summer months.
19. Supplies previously arrived in 2 month increments, but are now separated into multiple shipments over the two months due to space constraints.
20. The outpatient pharmacy in the Sheikh Zayed building has been closed due to insufficient staff availability.
  - a. Patients are still being sent to this pharmacy by the ED and/or clinics to fill prescription medications.
  - b. Upon arrival, patients realize that the pharmacy is closed and there is no signage to notify them that the outpatient pharmacy by the Ramallah wing is open.
  - c. Many ED and clinic staff (including physicians) do not seem to be aware that the Sheikh Zayed pharmacy has been closed for over 2 months and continue to refer patients to this pharmacy.
21. The inpatient pharmacy in the children's wing has been closed due to insufficient staff availability.
22. The pharmacy in the surgical wing provides pharmaceuticals to the wards in the surgical wing and the pediatric wing.
  - a. The process is such that the pharmacy in the surgical wing only contains the supplies of the medications for the surgical wing.
  - b. When the pharmacist needs to provide medications to the pediatric wing, the pharmacist closes the surgical wing pharmacy, goes to the pediatric wing pharmacy and fills the medications out of that pharmacy's inventory.
23. After the morning fill of medications, there is minimal activity within the surgical wing pharmacy.
24. The central pharmacy provides supplies to the entire PMC.
25. The central pharmacy provides pharmaceuticals to the Ramallah wing as well as the ED.
  - a. If the surgical wing pharmacy is closed, the central pharmacy will provide the pharmaceuticals to the children's wing and to the surgical wing.
26. The surgical wing pharmacy is quite spacious with a significant amount of empty floor and wall space.
  - a. Most of the cabinets and drawers along the back wall of this pharmacy are empty.
27. Team Building – The MD, RN and pharmacist in PMC seem to function and act totally independently rather than together as a team.
28. Clinical Pharmacy Services – at this point, the PMC pharmacy is not ready to provide adequate clinical pharmacy services. It would have been inappropriate and invaluable for the consultant to discuss clinical pharmacy services at PMC due to the significant disorganization and lack of adequate staffing levels to perform clinical functions.

## **RH**

29. Some of the MDs and many of the RNs rely on the pharmacists to provide clinical and/or procedural guidance about dosing, preparing and/or administering pharmaceuticals
  - a. At one point a clinical pharmacist position was created, but the demands of the clinical pharmacists with respect to office space, etc. were unrealistic and impractical, leading the physicians shying away from utilizing a clinical pharmacist as part of their team.
  - b. The clinical pharmacist at that time clearly did not understand what his/her role was and this led to tension with the physicians.
  - c. The physicians still would like a pharmacist to be clinically involved, but in a practical and appropriate manner.
  - d. The lead pharmacist has developed a good reputation with the RNs and several physicians, who now utilize her frequently for assistance.
30. The lead pharmacist is actively working on guidelines for pharmaceuticals to assist RNs on the wards
31. The pharmacy in RH is well organized and contains adequate space to store the pharmaceuticals in an organized manner
32. The temperature control within this pharmacy allows for pharmaceuticals to be stored under recommended conditions.
33. The controlled medication locker is quite small (approximately 1.5m H x 0.5m W x 0.5m D).
  - a. This locker only contains 3 shelves and only fits approximately 30% of the controlled medications
  - b. The remainder of the controlled medications is in drawers of an adjacent cabinet.
34. Although the room which is utilized to store the supplies (i.e. “disposables”) is of sufficient size, the lack of shelves leave staff with no choice but to keep the supplies in the cardboard boxes & stack them on top of each other.

## **HIS**

35. The HIS system is expected to be a central database which will be able to aid in running reports with respect to which medications are being utilized in which specific units, thus helping maintain a proper PAR level of pharmaceuticals as well as inventory control throughout the hospital. The HIS system is expected to be programmed in a manner which screens for appropriate dosing and medication utilization with respect to disease states, renal dosing, minimum/maximum dosing limits, duplicate therapy, and drug-drug interactions.

## **Alia Hospital**

36. Like the PMC and RH, Alia hospital had an established medication PAR level for the various wards and the emergency department.
37. Clinical pharmacy services are not yet implemented, but the pharmacists are utilized at times by nurses and physicians for questions about pharmaceuticals.

38. The pharmacy at Alia was very well organized and arranged such that inpatient and outpatient pharmacy services are within the same location.
  - a. This allows for the best uses of staff and allows inpatient and outpatient staff to aid one another when needed.
39. The space allocated to the pharmacy in is sufficient enough to allow for organized and safe storage of pharmaceuticals and supplies.
  - a. A separate room is designated for flammable medications and supplies.

## B. Challenges

1. (With respect to # 1 in **Findings**): The issue with having ample supply of medications on the wards is not due to inability to regularly access from the pharmacy. The PAR system is working for the staff. However, there are times when medications are on backorder or are not part of the EDL, thus unavailable.
  - a. At times, it is difficult to procure pharmaceuticals and/or supplies from the pharmacy because the required item(s) may be difficult to find between the various boxes stacked throughout the central pharmacy.
  - b. As with all manually controlled inventory systems, some medications may run out or end up in excessive supply on the wards. An example of this occurred when one ward had over 100 vials of nitroglycerin, while the other units (and the pharmacy) had none. This is due in part to the fact that currently there is no electronic inventory control once the medications are dispensed to the units and because some units will try to overstock urgent medications in fear of running out.
  - c. The lack of an organized pharmacy and electronic inventory control system makes this problem difficult to manage.
2. (With respect to #s 2, 3, 12, 13, 14, 16, 17 & 19 in **Findings**): These findings are primarily a result of insufficient space to allow for proper and orderly organization of pharmaceuticals and supplies.
  - a. The current space allocated to the central pharmacy is hardly enough to *adequately* house pharmaceuticals and supplies for *one month* for the Ramallah wing, let alone the 3 other wings within PMC.
3. (With respect to # 4 in **Findings**): Due to the patient flow and volumes of patients seen in the ED, the physicians and RNs are constantly being interrupted by random patients and/or the multitudes of visitors that accompany them.
  - a. This makes it difficult for the physicians to concentrate on their tasks and makes them significantly less efficient, forcing them to cut corners or forget to perform essential tasks such as transcription of the orders they verbalized to the RN.
4. (With respect to # 5 in **Findings**): the MoH is attempting to change the culture where patients are utilizing the ED as a general clinic at all hours of the day and has drastically reduced the variety of pharmaceuticals available in the ED.
  - a. The ED is being over utilized by the public for non-emergent situations such as cold and flu, minor abrasions, etc...

- b. Historically, this led to patients utilizing the ED as a place to seek therapy for these non-emergent situations, thus resulting in inappropriate utilization of the pharmaceutical supply of the ED.
  - c. However, the strict limitation of the types of pharmaceuticals available to the ED has led to a decreased ability for providing essential first dose antibiotics when the pharmacies are closed, appropriate analgesic management of trauma cases, and initiation of therapy in the ED for patients who are awaiting admission.
- 5. (With respect to # 6 in **Findings**): Sterile water in quantities sufficient for use in either ventilator humidifiers or isolettes is not currently available.
  - a. Lack of humidification of ventilators may lead to significant long term respiratory health problems to patients which will also increase the long term financial burden on the health care system.
- 6. (With respect to # 7 in **Findings**): Not having routine laboratory services available may impede how patients are treated with pharmaceuticals and/or may make it difficult to assess if drug levels are within the therapeutic range.
  - a. Use of medications with narrow therapeutic indices or injectable electrolytes may lead to patient harm if not managed appropriately, and knowledge of lab values in a timely manner is essential.
  - b. Many medications require different dosing in patients with impaired renal function. If a renally adjusted medication or a medication which may be contraindicated in renal dysfunction is initiated without checking renal function, there is a potential that more harm than good may result.
- 7. (With respect to # 8 in **Findings**): If a physician is not immediately available to manage a code blue, there is no protocol in place to guide the RN as to how to manage the patient until a physician arrives.
  - b. Depending on which physician arrives, the matter by which a code blue is managed is significantly different.
  - c. The doses and medications utilized are not standardized.
    - i. If there is a standard protocol, it is not being followed consistently.
- 8. (With respect to # 9 in **Findings**): On the wards, there is no space designated for the preparation of parenteral medications. RNs are not used to using aseptic techniques for preparing such pharmaceuticals.
- 9. (With respect to #s 10, 11, 27, 28, 29 & 30 in **Findings**): There is a lack of clinical resources which can aid physicians in utilizing the most appropriate pharmaceutical regimen for a specific patient. There are minimal, if any, clinical pathways available for disease states such as septic shock, diabetic ketoacidosis, asthma, sickle cell, pediatric and neonatal TPN dosing, etc.. The Palestinian health care system does not mandate any continuing education, thus leading to education either ending after completion of school or learn as you go.
  - a. The use of pharmaceutical company representatives can be quite risky since they frequently down-play or not mention the negative effects of various pharmaceuticals and in order to sell more of their product.
  - b. The use of clinical pharmacists can be quite beneficial to the health care team. RH has knowledgeable pharmacists which are under utilized as pharmaceutical

references. The pharmacists at PMC, due to the inefficient arrangement of the pharmacy and limited staffing, are not yet able to provide such clinical support on a regular basis to physicians and nurses.

10. (With respect to # 18 in **Findings**): Due to the absence of air conditioning to cool down the work area as well as minimal flow of air, staff must open the windows of the pharmacy to allow for air and what little breeze is available to blow in. The lack of temperature control in the central pharmacy has two major challenges.
  - a. Most pharmaceuticals are recommended to be stored at temperatures of 25 degrees Celsius and may be stable at temperatures of 30 degrees Celsius. However, the temperature inside the central pharmacy is regularly well over 30 degrees Celsius during the summer months. This can lead to degradation of pharmaceuticals, rendering them less potent and/or potential dangerous for use.
  - b. The work environment of the central pharmacy being cramped and quite hot will lead to decreased efficiency of staff due to inability to work well in an uncomfortable environment.
11. (With respect to # 20 in **Findings**): Due to insufficient staffing, the pharmacy of the Sheikh Zayed building had to be closed to consolidate staff to help with the remaining pharmacies. It leads to decreased customer satisfaction and/or care when patients are sent to a pharmacy by clinicians and the pharmacy is closed. Clinicians are not aware of the closure of the Sheikh Zayed pharmacy and continue to refer patients to this pharmacy. When patients arrive to this pharmacy, there is no posting to notify them that this pharmacy is closed and that the outpatient pharmacy by Ramallah building is open.
12. (With respect to #s 21 & 22 in **Findings**): The children's wing pharmacy, like Sheikh Zayed pharmacy, is closed due to insufficient staffing. There are minimal challenges from this pharmacy being closed at this moment, since the surgical wing pharmacy provides coverage and the demand is quite low.
  - a. Having the inventories of each wing within the respective buildings and the pharmacist going back and forth from building to building to fill medications leads to a significant waste of time which can be better utilized in other areas in the pharmacy department.
  - b. Having two separate inventories for areas which are managed by the same pharmacy leads to extra paperwork and man hours being used ineffectively.
13. (With respect to # 23 in **Findings**): There is minimal, if any, work to be done in the surgical wing pharmacy after the morning fill of medications is completed. At times, there are two employees in this pharmacy. This is an extremely ineffective means of utilizing staff and services.
14. (With respect to # 24 in **Findings**): The current space allocated to the central pharmacy makes it extremely difficult to store the supplies in an organized manner, resulting in problems with finding supplies at a later date.
15. (With respect to # 25 in **Findings**): The process set up with which the central pharmacy serves as a back up when the surgical pharmacy is closed is a good one. However, due to the poor organization of the central pharmacy (mostly due to inadequate space), delays can occur when trying to gather items.

16. (With respect to # 26 in **Findings**): The space in the surgical wing pharmacy, as well as the configuration and/or lack of shelving within this pharmacy result in a significant amount of wasted space. The bareness of this pharmacy decreases its ability to take on a larger inventory and offset some of the inventory of the central pharmacy.
17. (With respect to #s 31 & 32 in **Findings**): Due to the adequate space and shelves for the pharmaceuticals in RH, there are no challenges with the manner by which non-controlled pharmaceuticals are stored and organized.
18. (With respect to # 33 in **Findings**): The supply of controlled medications is significantly more than the space allocated for these medications. Having the controlled medications stored in an unsecured area may lead to inventory control issues for opioid medications.
19. (With respect to # 34 in **Findings**): The lack of shelving in the supply storage room leads to problems with safe and organized storage. Due to the lack of shelves, supplies are stacked on top of each other:
  - a. This can be quite dangerous if the supplies tip over.
  - b. This can make it difficult if the required supplies are on the bottom of the stack.
  - c. This may make it more difficult to locate supplies since boxes are stacked based on where they fit, rather than an organized sequence.
20. (With respect to # 35 in **Findings**): Although the HIS system appears to have many useful capabilities, its actual utilization will depend on the data which is entered into it (i.e. physician order entry, pharmacy inventory, unit inventory, etc).
  - a. Physicians, nurses, and pharmacy staff are currently stretched thin with the responsibilities which they are currently required to manage. It may not be possible with the current staffing workload to add the workload of entering data into a computerized system since it will require more time than the current method
  - b. There are minimal, if any, computers on the nursing stations. This will make it extremely difficult for physicians to process their documentation into the computer system as well as for the RNs to look up the information which they will need to manage the care of their patients.
21. (With respect to #s 36-39 in **Findings**):
  - a. No specific challenges were noted with respect to pharmacy services operations at Alia hospital.
    - i. The workflow and work environment allows pharmacy staff to work in an efficient manner.
  - b. Pharmacists are not yet regularly utilized as resources with regards to questions about pharmaceuticals.

## **C. Recommendations**

### **PMC PHARMACY**

- I. The central pharmacy should be relocated to a space large enough to allow for proper and organized storage of the pharmaceuticals. This space should also contain

air conditioning to prevent medications from sitting at temperatures well above the recommended storage temperatures for prolonged periods of time.

2. The central pharmacy should be located in a space with access to a ramp to allow for pharmaceuticals and supplies to be taken from the delivery trucks and into the pharmacy in an efficient manner, thus negating the need to leave these items in the sun/rain for extended periods of time
3. The central pharmacy should be relocated to the Sheikh Zayed building, on the basement floor.
  - a. The current pharmacy in the Sheikh Zayed building should be utilized as the new central pharmacy
    - i. The shelves which were removed from the wall to the left should be restored to allow for extra storage space. There was mention of adding more desk space, but this room contains ample countertop space and would be better served to have more shelves rather than another desk.
    - ii. There should be minimal pharmaceuticals kept in the large cardboard boxes.
    - iii. Pharmaceuticals need to be arranged in an organized manner, and ample space should be provided to minimize the need to have the same pharmaceutical stored in different areas of the pharmacy.
  - b. The storage room across the hallway from the Sheikh Zayed pharmacy should be used to store the overstock of pharmaceuticals.
    - i. Due to the supply of pharmaceuticals arriving bi-monthly, a large space is required to adequately store the supplies which are to be used for the various areas for 2 months.
    - ii. Allowing for better organization of pharmaceuticals will allow for much better inventory control, a reduction in expired medications, as well as a reduction in inability to find medications within the pharmacy. Inside this space, there are currently quite a number of empty shelves present. There is also a space near the back of this room which is empty and can house at least one extra set of shelves.
    - iii. A large refrigerator should be added in this storage room to allow medications requiring refrigeration to be stored in it, rather than places such as the hospital kitchen refrigerator.
      - I. This will allow for easier access to pharmaceuticals, as well as a better system for pharmaceutical inventory control.
    - iv. Utilizing this space for overstock will minimize the need to keep pharmaceuticals outside, where they are exposed to temperatures that may affect their stability.
    - v. The pharmaceuticals should be organized systematically, not randomly or “wherever they fit.”
  - c. Once this pharmacy is functional under this new setting, an assessment can be made to see if it can dub as an outpatient pharmacy as well as the central inpatient pharmacy.

- i. The purpose of this outpatient pharmacy will be to primarily support the emergency department.
4. The basement floor of the Sheikh Zayed building is quite spacious and contains several large offices and/or rooms which are not being utilized. A portion of this space should be converted to a space which supplies (i.e. disposables) are stored.
  - a. The rooms designated for these supplies should be of adequate size to handle the load of supplies which is required to keep the hospital functional, as well as the bulk supplies which are donated from time to time.
  - b. These rooms will require shelving throughout.
    - i. To be able to store the supplies in an organized and safe manner, the shelves should be 2/3 to 1 meter in depth.
  - c. Supplies should be stored on the shelves in the manner which they are dispensed to the various wards or clinics.
    - i. There should be minimal supplies kept in cardboard boxes. Having the supplies out of the boxes will make it easier to locate and dispense, thus improving workflow.
    - ii. The supplies should be organized systematically, not randomly or “wherever they fit.”
5. It is imperative that ramp access is present from where the delivery trucks drop off the pharmaceuticals and supplies to where they need to be stored in the pharmacy or storage room.
  - a. This will allow for a significantly more efficient and safer manner by which these items are put away. The pallets of supplies and pharmaceuticals can be delivered to the front door of the pharmacy.
  - b. The current system of bringing these items in from a window is extremely inefficient, leads to medications exposed to unacceptable weather conditions for prolonged periods of time, as well as have the potential of causing back injuries to employees due to the nature by which these items need to be carried through this window.
  - c. When the radiology department is built out in the Sheikh Zayed building, it is imperative that a route with ramp access is available for pharmaceuticals and supplies remain.
6. The timing of the move should be done logistically.
  - a. Every 2 months, a large shipment of pharmaceuticals arrives.
    - i. Rather than moving all the items at once, it would be more efficient to time the move according to the bi-monthly shipment date.
    - ii. On the day of delivery of the new shipment, rather than supplies dropped off at the Ramallah pharmacy and carried over, they can be dropped off at emergency wing (Sheikh Zayed building) and immediately put away in the pharmacy and designated storage area.
7. Although there may be the argument that it would be better to keep the central pharmacy in the Ramallah wing building due to the greater demand being in that building, it would actually be more efficient and effective to have the pharmacy in the emergency wing building due to the space availability allowing for a much more

organized pharmacy. The space allocated to pharmacy in the Ramallah building is far insufficient to maintain an inventory in an organized manner to serve the PMC.

- a. The efficiency generated from having a more spacious and organized pharmacy will be much greater than the delays caused by having the central pharmacy located in the building across the way.
  - b. There should also be less concern about staff having to carry supplies from the central pharmacy in emergency wing to the Ramallah building.
    - i. The risk of injury is actually greater in the current system since the carrying of large bulky supplies through a window and trying to move them in an over-crowded space is much more likely to result in injury.
    - ii. When items are taken from the pharmacy to the wards and clinics, they are done so in smaller quantities, thus should not be an injury risk.
  - c. If there is a continued concern about delays in the delivery of items from the pharmacy if it is moved to emergency wing, an extra pharmacy helper should be considered.
    - i. This role would serve the primary purpose of a courier from the pharmacy to the wards and clinics. This courier can also be responsible for delivering the daily medication supplies to the nursing wards, thus negating the RN's need to make a daily trip to the pharmacy each day.
    - ii. When the HIS system is implemented, the pharmacy should be able to view the patient medication profiles electronically and will not need to base their fill on the nursing drug sheets, thus further supporting the ability of a courier to work out well for the pharmacy.
8. The pharmacy in the surgical wing should be restructured to allow for a greater ability to store supplies and pharmaceuticals.
- a. There is a significant amount of empty space in this pharmacy that can be utilized to place more shelves and counters to store pharmaceuticals and supplies.
  - b. A large medication refrigerator should be added to this pharmacy for storage of medications requiring refrigeration.
    - i. This will decrease the need of utilizing places such as the kitchen refrigerator to store pharmaceuticals.
  - c. Surgical wing pharmacy has ample space to store pharmaceuticals for both surgical and children's wings. Although the space is sufficient enough to maintain two distinct physical inventories for each building, they should be merged into one larger inventory and each place treated as a separate ward. In the new model, these facilities should be considered as part of the same complexes, thus there should be no need to treat them as completely separate entities.
  - d. Due to the significantly low workload, the surgical wing pharmacy should only be staffed by one pharmacist with no assistant at all times.

- e. Due to the significantly low workload, this pharmacy may also dub as an outpatient pharmacy, strictly providing services to patients being discharged from the surgical wing and the children's wing.
9. Until the HIS system is implemented, the current system of PAR levels of medications on the units should be maintained. However, each area should also develop a MAXIMUM drug level, and if the quantities exceed these supplies, they should be returned to the pharmacy.
    - a. This will decrease the likelihood that a medication remains on the ward beyond its expiration date, as well as place those medications back in circulation to allow them to be available to other units.
  10. Currently there is a lead pharmacist (responsible pharmacist as they call him), 4 pharmacists, and 4 helpers (pharmacy technicians) in the department of pharmacy. To best utilize the staff, the following recommendations of staff distribution should be considered:
    - a. Outpatient pharmacy in Ramallah building: 1 pharmacist + 1 helper
    - b. Surgical wing pharmacy: 1 pharmacist
    - c. Central Pharmacy: 2 pharmacists + 2 helpers + lead pharmacist
      - i. One of the helpers and the lead pharmacist should be responsible for inventory management, etc
      - ii. The 2 pharmacists and the other helper should be responsible for pharmaceutical and supply distribution.
        - 1. If the new arrangement allows for it, they can also provide outpatient services.
  11. In this model, the need for a pharmacy in the children's wing is omitted. The workload required for this building is minimal and does not require its own pharmacy. The surgical pharmacy should be sufficient to provide ample services.
  12. If a decision is made for a pharmacy and a pharmacist to continue to exist in the pediatric wing, this pharmacist should be expected to serve a dual role of a dispensing pharmacist as well as a clinical pharmacist to aid the health care team.

#### RH PHARMACY

13. The storage room utilized for supplies will significantly benefit from having multiple shelves added throughout.
  - a. The shelves in this room should be approximately 1m in depth to allow them to be functional and usable to store the bulk of supplies which arrive every two months.
  - b. The shelves should be arranged along the perimeter of the room as well as double-sided shelves along the center.
14. The room which contains the controlled medications should have a large cabinet added to allow for a better and more secure means of storing these medications.
  - a. There is ample space in the center of this room to build a floor mounted cabinet approximate 1.5m H x 2m W x 1m D.

- i. This can be built such that there are cabinet doors on both sides, with each side having a cabinet depth of 0.5m (i.e. allow it serve like 2 cabinets back to back).
  - ii. The top of this can be used as a counter top for preparation of pharmaceuticals or other tasks requiring a countertop.
- 15. Continued education about the availability and benefit of clinical pharmacy services is highly recommended.
  - a. The pharmacists at RH have a good workflow which allows them to be available to provide physicians and RNs with information about pharmaceuticals.
  - b. The clinical pharmacists need to be educated on what their roles are *and* are not:
    - i. They are assistants to the physicians in providing advice about the most appropriate medications for a specific patient.
    - ii. They are not the prescribers nor do they have the final say on the regimen which is utilized.
      - 1. Palestine regulations hold the physician accountable, and thus the physician should continue to be empowered to make the final decision
      - 2. If the physician decides to bypass a pharmacist recommendation, the physician should document the clinical reason as to why this was done, as well as help the pharmacist understand why their recommendation was not taken.
        - a. This will force the physician to think his decision through, as well as add to the education of the clinical pharmacist.

### EMERGENCY DEPARTMENT

- 16. There needs to be a continued focus on the Triage System in the ED. The less crowded the ED, the more efficient and effective the MDs and RNs will be. Non-urgent cases should be referred to clinics for management.
  - a. The triage system may help prevent the misuse of the ED and encourage the MoH to allow more medications to be in the ED to allow for more comprehensive treatment of true urgent/emergent cases.
- 17. Patients and their families should be disallowed from hovering around the nursing station and interrupting the MDs and RNs
  - a. These constant interruptions, in addition to impeding workflow, may result in significant patient harm
  - b. If clinicians are constantly interrupted, there will be an increased risk which they may order and/or administer the wrong medication and/or the wrong strength of the medication due to the distractions.
- 18. The types of medications available in the ED are insufficient and inadequate to initiate care of the patients. Patients who come in with highly elevated temperatures and may have a bacterial infection should receive their first dose of antibiotic

administered in the ED if they arrive after the pharmacy is closed. Waiting until the next day to initiate antibiotic treatment may result in progression of the infection and may increase the risk of complications from infections.

- a. The ED does not regularly use analgesia in cases where analgesia is required. Also, when analgesia is utilized, the only analgesic available is parenteral diclofenac.
    - i. Diclofenac does not provide adequate analgesia for severe pain and may be unsafe to use in patients at risk for renal dysfunction.
    - ii. Opioid analgesics should be considered as part of pain management in the ED. Fentanyl and/or ketamine should be made available to the ED, with guidelines on how and when to use them.
19. Currently, the ED serves more as a place to triage patients to be admitted or to the operating room or clinic. For cases which the patient requires surgery and/or admission, the ED should be utilized as a place in which patient care is initiated.
- a. There will be times when the wards are full and/or the operating room is not immediately available, thus requiring the need for the patient to be managed in the ED.

#### ICU/NICU

20. Water is not being utilized in ventilators. The lack of humidification in with ventilators may result in significant long term pulmonary complications.
- a. 250 mL to 1 Liter bottles of sterile water should be added to the EDL and be available in suitable quantities.
    - i. It would significantly improve the care delivered to high risk, critically ill patients to have sterile water for both the ventilator humidifiers and the isolettes.
  - b. The small initial financial investment will result in large financial savings in the long run since it will minimize the risk of long term respiratory complications.
21. CODE BLUE management needs to be standardized for the various areas: Adult, Pediatrics and NICU.
- a. The extreme variation from provider to provider in terms of how a code blue is managed makes it difficult for the RNs to be better able to aid the physician.
  - b. The various areas were provided with code blue dosing sheets, ACLS or PALS guidelines, as well as recommendations with how to manage codes.
    - i. Physicians and RNs should be trained to follow these guidelines and a follow up should be done to assure continued understand and compliance with these guidelines.
    - ii. At minimum, semi-annual examination, utilizing mock codes should be performed to help maintain the level of comfort with managing code situations.
  - c. In the event which there is a delay for the MD to respond to a code blue, a hospital approved code blue standing order set should be established.

- i. This will allow the RN to initiate the code, following the approved protocol, until the MD arrives to the ward.
  - I. There should be separate order sets for adults, pediatrics & NICU.
- ii. A copy of this order set should be readily available on all units throughout the hospital.

#### TPNs

- 22. Nurses should be trained about the use of aseptic techniques for the preparation of TPNs as well as all parenteral pharmaceuticals.
- 23. TPNs should be prepared on a clean area. A disinfectant such as alcohol should be used to wipe down the surface and the caps of the various vials prior to compounding.
  - a. Gloves should be worn during the preparation of parenteral products.
  - b. If gloves are not readily available, hands should be thoroughly cleaned with an antibacterial soap and water.

#### HIS

- 24. The HIS system demo showed promising capabilities of the product. However, due to the inability to actually see the system in effect, as well as see how staff will be utilizing it, the consultant is unable to make significant recommendations at this point. The main recommendations are:
  - a. Make sure that the staffing levels are increased to allow for the required data to be entered into the system without compromising patient care.
    - i. Attempting to add this responsibility to the current staff may not be realistic or safe.
  - b. Educate the lead pharmacists on how to utilize the system to manage inventory levels within the pharmacy as well as the wards and clinics.
  - c. Educate clinical pharmacists how to run reports which may aid in performing drug utilization evaluations and/or disease management evaluations.
  - d. Whenever possible, create pre-defined templates to allow for more efficient data entry into the system (including order sets for physicians).

#### EDL

- 25. From discussions with the pediatrics, they have adapted their practice to utilize pharmaceuticals available for the EDL. Continued education is required to educate physicians on how to adjust dosing of these medications for the pediatric population.
- 26. The primary recommendation, as mentioned above, is to add bulk bottles of sterile water for ventilator use.

#### Continuing Education

- 27. To help keep clinicians up to date on important health care subjects, a continuing education requirement should be considered.

- a. The focus should be aimed at disease states and/or issue of concern within the Palestinian health system, making it more relevant and useful to the clinicians.
- b. This should include physicians, nurses, and pharmacists.

Alia Hospital

28. The pharmacists should be trained and utilized for clinical pharmacy care.
  - a. If insufficient staff is available to make rounds and attend morning reports with physicians, pharmacists can still be utilized as the primary and central source of information with respect to pharmaceuticals.

#### **D. Next Steps**

1. The first item which needs to be done with respect to pharmacy is finding an adequate place for the PMC central pharmacy, as well as adding sufficient shelving for the various pharmacies.
2. Develop a structured system by which pharmaceuticals and supplies are stored in the pharmacy.
3. Acquire an adequate supply of refrigerators for the pharmacies to be able to store pharmaceuticals (i.e., avoid having to use non-pharmacy places to store pharmacy supplies).
4. Add sterile water 250ml to 1 Liter bottles to EDL and make readily available for intensive care areas to use with ventilators.
5. Create a uniform process by which Code Blues are managed.
6. Train RNs on aseptic techniques for preparation of parenteral medications.
7. Develop a system for interdisciplinary team building. Once accomplished, along with other recommendations regarding pharmacy space and workflow, the HIS can eventually be used to help improve clinical services.
8. Continue to build upon the good relationship between the pharmacy departments at the various MoH facilities.
  - a. The various pharmacies should continue to work together and collaborate to create consistent resources which can be utilized to help provide clinical assistance at the various facilities.
9. Use the various resources provided by the pharmacy consultant (both hard copies and electronic material) in order to best advance healthcare throughout the MoH with respect to pharmaceutical care.
10. The following are a series of pictures and diagrams with recommendations of the suggested modifications to improve pharmacy services at PMC and RH:

**PMC Central Pharmacy in Ramallah wing:**

These pictures were taken the week prior to the large bi-monthly shipment is set to arrive. When the shipment arrives, there will be even less room for staff to move around the pharmacy as well as more boxes stacked high on top of each other. The window in the back of the picture is when supplies are brought into the pharmacy when the shipments arrive.



Observations and Recommendations Regarding Pharmacy Services and Pharmaceuticals at Rafidia Hospital and the Palestine Medical Complex  
Palestinian Health Sector Reform And Development Project (The Flagship Project)



Note

the ethylene oxide stacked high. If this tips over and breaks, it can be quite toxic to the staff.



The bottom picture is the closest they are able to get to organized, however, this is due to the fact that they are near the last couple of weeks before the large bi-monthly shipment arrives.

The follow pictures are of the Emergency Wing (Sheikh Zayed) Pharmacy and the storage room directly across. This is what is being recommended to be utilized as the new central pharmacy, as well as the addition of a large refrigerator for housing pharmaceuticals in the storage room. Note that this pharmacy has a good amount of desk space for staff to operate, better lighting, and is able to accommodate appropriate shelving.



The back wall in this picture used to contain shelves which spanned a width of 300cm and were as high as the ones seen to the right of this picture. Restoring these shelves will further increase this pharmacy's storage capability.

Below are pictures of the storage room across from this pharmacy. These shelves can be utilized to store all the pharmaceuticals needed, as well as some supplies. Not show in these pictures is the wall as you enter the room. There is sufficient space to place a large medication refrigerator along this wall.



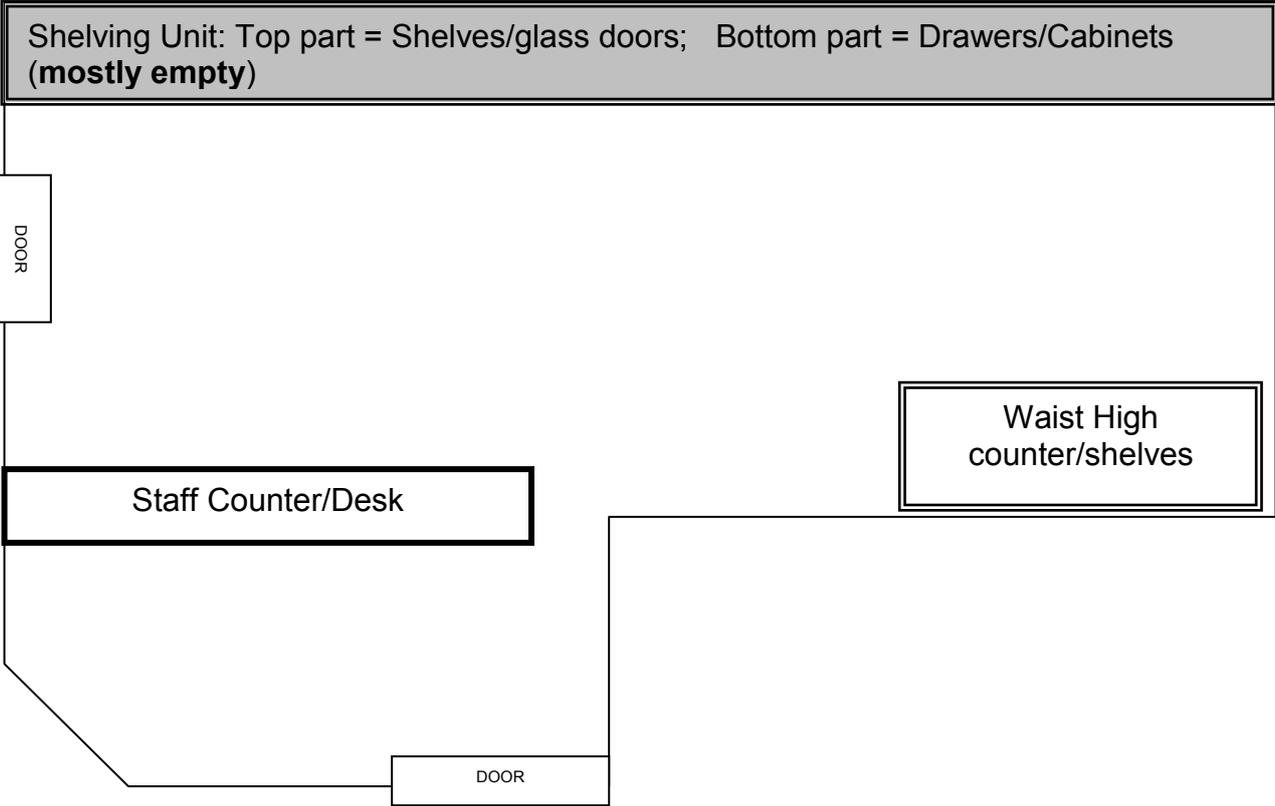
The empty space in this area is sufficient to handle another set of shelves to further increase storage capability.

This is one of the examples of how pharmaceuticals are left outside. On this day, the temperature is 41 degrees Celsius. Often times, the gate in the background is left open. This area also houses a significant amount of trash and a couple of unused ambulances. There are times when there is no space in this area, thus leaving these pallets to be stored out in the sun or rain.

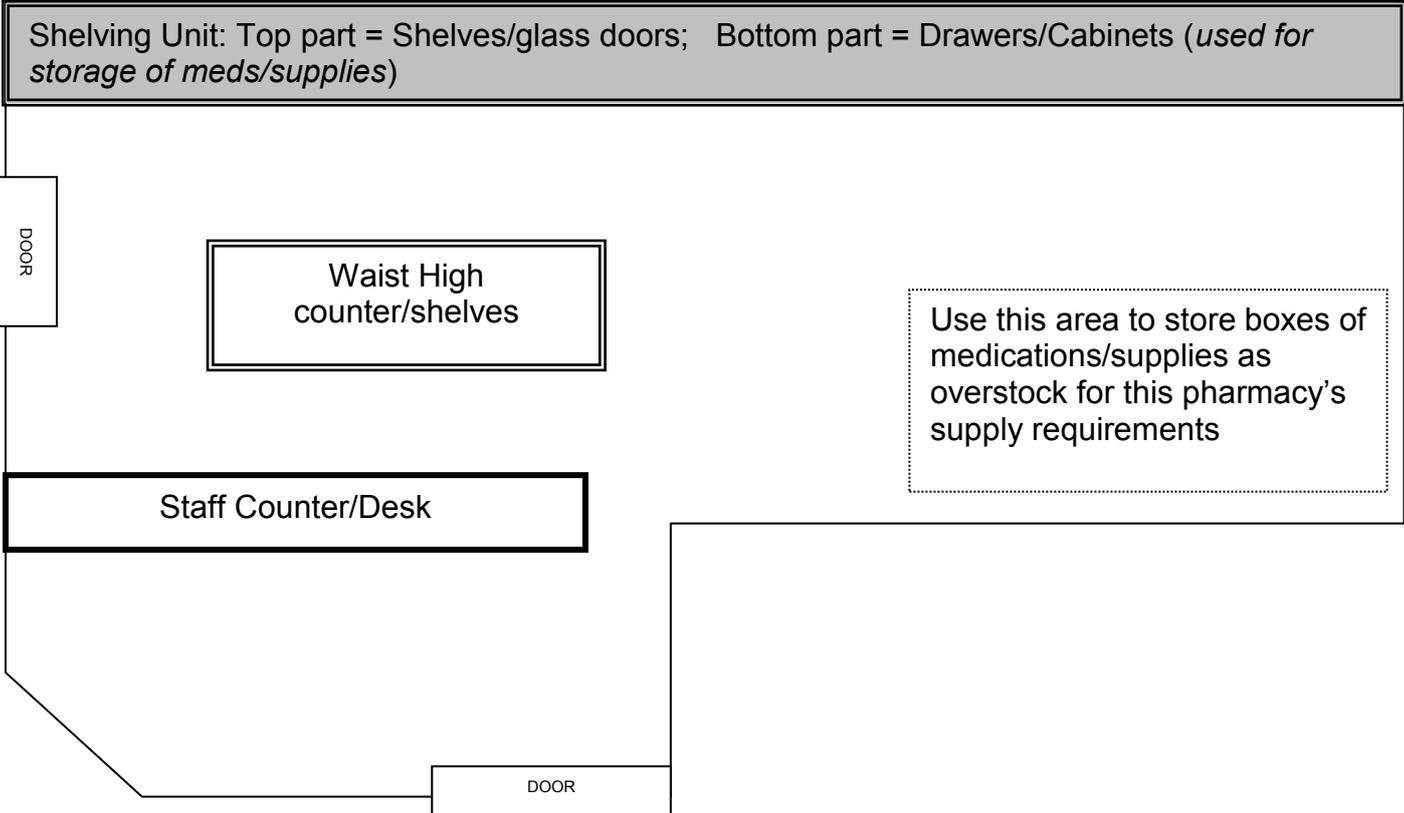


The next series of schematics are recommendations about how the Surgical Wing pharmacy can be modified to allow for significantly more storage capabilities.

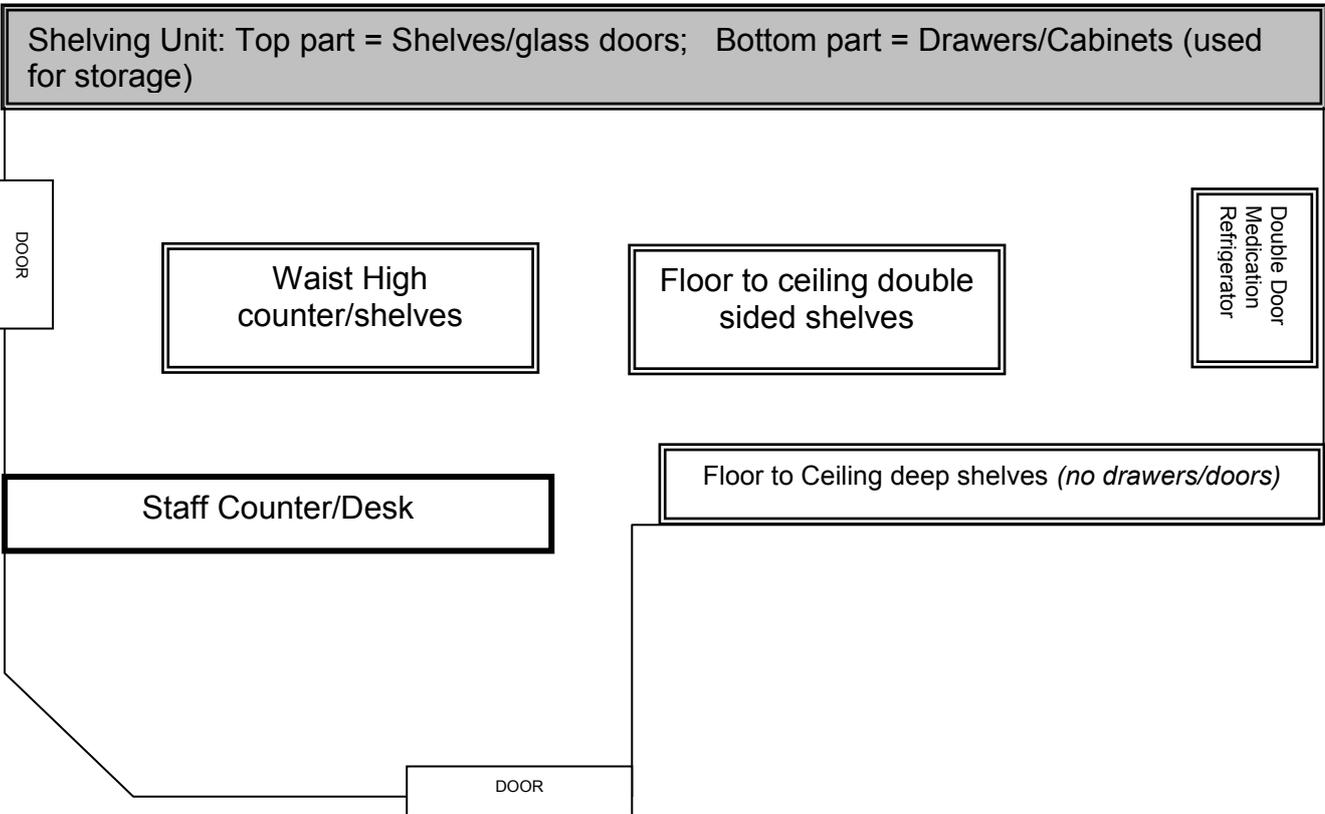
**Current Set Up:**



**Short Term Modifications:**



**Long Term Modifications:**



Pictures of storage room in **Rafidia Hospital**. The space is sufficient, but the lack of shelves make it difficult to store supplies in an organized manner.



No picture is available, but as noted above in recommendations, the pharmaceutical storage room in the Rafidia Pharmacy should have a counter with lockable cabinets built in the center of the room. This should be mounted to the ground and utilized for the storage of controlled pharmaceuticals. The recommend dimensions of this cabinet/counter top are 1.5m H x 2m W x 1m D. It should be constructed with cabinet doors on either side, where it functions as if it were to different sets of cabinets back to back. The need for this cabinet is due to the fact that most controlled medications are not stored in the locked vault due to the large supply of controlled medications and small size of the vault.

The following are pictures of how a supply storage room should look like. Notice that most items are out of the cardboard boxes and labeled. The organization of the supplies is systematic, rather than random. Each product has a designated space sufficient to fit the bulk shipment which it arrives in.



## **ANNEX A: SCOPE OF WORK**

### **Short-Term Consultancy Agreement Scope of Work**

SOW Title: Clinical Pharmacist

Work Plan No:

SOW Date: May 19, 2010

SOW Status: Draft

Consultant Name: Mohammed Ghonim, Pharm.D.

Job Classification: Short-Term US Expatriate Clinical Pharmacist Consultant

Reporting to: Dr. Jihad Mashal, Director of Clinical and Community-based Health, Comp 2

#### **I. Flagship Project Objective**

The Flagship Project is a five-year initiative funded by the U.S. Agency of International Development (USAID), and designed in close collaboration with the Palestinian Ministry of Health (MoH). The Project's main objective is to support the MoH, select non-governmental organizations, and select educational and professional institutions in strengthening their institutional capacities and performance to support a functional, democratic Palestinian health sector able to meet its priority public health needs. The project works to achieve this goal through three components: (1) supporting health sector reform and management, (2) strengthening clinical and community-based health, and (3) supporting procurement of health and humanitarian assistance commodities.

The Flagship Project will support the MoH in implementing health sector reforms needed for quality, sustainability, and equity in the health sector. By addressing key issues in governance, health finance, human resources, health service delivery, pharmaceutical management, and health information systems, the Ministry will strengthen its dual role as a regulator and main health service provider. The Flagship Project will also focus on improving the health status of Palestinians in priority areas to the Ministry and public, including mother and child health, chronic diseases, injury prevention, safe hygiene and water use, and breast cancer screening for women.

#### **II. Specific Challenges to Be Addressed by this Consultancy**

The quality of Palestinian health services has been compromised by fragmentation among health service providers, resulting in multiple and varying clinical standards and norms. There has been little citizen participation and feedback solicited by the MoH, resulting in a gap between citizen expectations and MoH delivery of services. Improvement of pediatric services in MoH hospitals is a priority of the MoH and Flagship staff is committed to help initiate change and necessary reforms to deliver better secondary health care services to the Palestinian people.

### III. Objective of this Consultancy

This consultancy will contribute to improving MoH services at the secondary health care level by improving the expertise of staff in various aspects of clinical pharmacy, and in assisting in planning for the implementation of suitable systems for pharmaceutical management and support, in Rafidia Hospital in Nablus and the Palestine Medical Complex (PMC) in Ramallah, concentrating on patient safety and medication management.

### IV. Specific Tasks of the Consultant

Under this Scope of Work, the Consultant shall perform, but not be limited to, the specific tasks specified under the following categories:

- A. **Background Reading Related to Understanding the Work and Its Context.** The Consultant shall read, but is not limited to, the following materials related to fully understanding the work specified under this consultancy:
- Previous Loma Linda University Flagship Project technical reports relating to the PMC
  - Loma Linda University GHI Consultant Orientation Guide
  - Previous Flagship Project technical reports, Work Plan, etc.
  - MoH National Strategic Health Plan
  - USAID Flagship Project Quarterly Reports
  - USAID Needs Assessment Report, December 2008
  - USAID MOH Institutional Development Plan
  - Rand Corporation, "Building a Successful Palestinian State," 2007
  - Rand Corporation, "Strengthening the Palestinian Health Care System," 2005
  - The Palestinian Essential Medication/Drug List (EDL), 2007
- B. **Background Interviews Related to Understanding the Work and Its Context.** The Consultant shall interview, but is not limited to, the following individuals or groups of individuals in order to fully understand the work specified under this consultancy:
- Chemonics Project Management Unit (PMU), if appropriate
  - Chemonics Field Office Staff, Flagship Project
    - Taroub Harb-Faramand, MD, MPH, Chief of Party
    - Damianos Odeh, PhD, Deputy Chief of Party
    - Jihad Mashal, MD, MSc, MBA, Director of Clinical and Community-based Health
    - Issa Bandak, MBA, MHSA, Hospital Management Support - Team Leader
    - Paul Rader, MHA, PhD, Advisor, Hospital Management
    - Harry Gunkel, MD, Advisor, Medical Affairs
    - Amal Bandak, RN, PhD, Hospital Specialist and Nursing Advisor
    - Amal Daoud, RPh, MPH, Project Officer
    - Maha el-Saheb, MD,FP, Quality Assurance Specialist
    - Procurement Team
    - HIS Team
  - Appropriate MOH Staff and others as appropriate
  - Pediatric and Emergency Hospital Staff and others as appropriate
- C. **Tasks Related to Accomplishing the Consultancy's Objectives.** The Consultant shall use his/her education, considerable experience and additional understanding gleaned from the tasks specified in A. and B. above to:
- Assess and evaluate pharmacy services in 2 MoH hospitals, Rafidia Hospital and PMC, in coordination with the Flagship team and MoH counterparts. This assessment should include and not limited to the area of structure and operations of the pharmacy departments - inventory control, stock turns, par levels, staffing, etc.
  - Make practical clear recommendations to improve pharmacy services based on the assessment. The recommendations should be in writing and assure a concrete, feasible plan of action that can be implemented to improve pharmacy services, and that is appropriate to the local context and health system in Palestine. This should be supported by providing

sample policies, procedures, guidelines, such as but not limited to: compounding, TPN preparations, stock inventory and control, supply maintenance and dispensing on wards, tracking drug-drug interactions.

- Assess and make recommendations regarding the suitability of the Essential Drug List of the MoH for pediatric/neonatal in-patients.
- Provide reference material for pediatric medication use (for example; dosages, metabolism, side effects, indications for use, etc.).
- Conduct lectures on relevant clinical pharmacy topics related to medication management and TPN focusing on the importance of interdisciplinary team (physicians, nurses, pharmacists) in carrying out such clinical activities. Provide teaching aids (e.g., slides, textbooks, handbooks, etc). **Topics to be identified.**
- Provide recommendations related to pediatric and emergency care clinical pharmacy services that may be integrated into the HIS being implemented in the MoH in Year 3 of the project.
  
- In the event that new priority tasks are introduced during the consultancy, the consultant will work with the Flagship project staff to revise the tasks and expected products to accommodate for the new priorities
- In addition to the above-listed tasks, the Flagship Project welcomes additional contributions and creative ideas in support of the Flagship objectives
- The consultant is encouraged to support the identification of additional STTA and scopes of work to help accomplish Flagship goals and objective where possible

## V. Expected Products.

Within four days of the consultant's arrival the consultant should provide the methodology for successfully completing the work (using Annex I: STTA Methodology). The substance of, findings on, and recommendations with respect to the above-mentioned tasks shall be delivered by the Consultant in a written report, policy statement, strategy, action plan, etc. for submission to USAID (using Annex II: the Flagship-provided STTA report template). A **draft detailed outline** of this report is due 3 days prior to the consultant's departure and final no later than 7 business days after the consultant's departure.

Specific deliverables to be attached to final report:

- The Assessment and evaluation report of the 2 hospital facilities.
- A concrete, feasible plan of implementing a clinical pharmacy service focusing on management system and quality assurance applicable to the local context.
- The prepared materials and supporting aids used to deliver the 4 lectures
- Clear recommendations related to the MoH EDL for Pediatric Care
- The prepared polices, procedures, protocols, etc

## VI. Timeframe for the Consultancy.

The timeframe for this consultancy is on or about August 14 to concluding on or about Sept 4 in the West Bank.

## VII. LOE for the Consultancy.

The days of level of effort are estimated to be 2 days for preparation work prior to departure; 3 days for travel; maximum 17 days for work in the West Bank (6 day work week maximum);. [LoE max 22]

## VIII. Consultant Qualifications.

The Consultant shall have the following minimum qualifications to be considered for this consultancy:

### Educational Qualifications

- Shall be a currently licensed clinical pharmacist in good standing

#### Work Experience Qualifications

- Minimum of 5 years of work in Clinical pharmacy services
- Experience in Pediatric / Neonatal Care and Emergency Care
- Worked in a multi-disciplinary environment
- Successful involvement and participation in international health and/or development of health systems
- Arabic language and culture awareness is a clear advantage.

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## ANNEX B:ASSIGNMENTSCHEDULE

The consultant should include a list of meetings held and main agenda items which occurred during the short-term assignment.

DATE	ACTIVITY	LOCATION
Saturday, 8/16/2010	Depart	Loma Linda
Sunday, 8/17/2010	Spent night in New York due to airplane cancellation. Further delays and airplane issues in NY.	New York
Monday, 8/18/2010	Continuation of Flight from NY to Tel Aviv. Several hours in airport with IDF personnel. Meeting with Dr Harry Gunkel regarding consultancy expectations.	Tel Aviv/ Ramallah
Tuesday, 8/19/2010	Met with Flagship Project Personnel. Review SOW	Ramallah
Wednesday, 8/20/2010	Visited various areas in PMC. Gave lecture about insulin therapy to pediatrics MDs	Ramallah
Thursday, 8/21/2010	Visited various locations throughout PMC to assess medication management process. Gave lecture on management of pediatrics in the critical care settings to pediatrics MDs	Ramallah
Friday, 8/22/2010	Reviewed notes of previous week's observations. Completed initial draft of workplan. Gathered data for STTA.	Ramallah
Monday, 8/23/2010	Ministry of Health: Meet with Dr. Rania Shahin, General Director of Pharmacy, and Dr. Ahmad Surgholi, Director of Hospital Pharmacies. Rafidia Hospital – observed pharmacy services, pediatric and NICU areas. Met with physicians to discuss clinical pharmacy services.	Nablus
Tuesday, 8/24/2010	Rafidia Hospital – provided lecture about roles and responsibilities of clinical pharmacist to pharmacy school students and clinical pharmacists. Observed pharmacy workflow and provided resources to lead pharmacist & explained how to use these resources. Provided NICU and Pediatrics physicians with PALS guidelines, Pediatric and NICU Code Blue dosing booklets. Provided ICU	Nablus

	with Pediatric and Adult Code Blue information and PALS and ACLS algorithms.	
Wednesday, 8/25/2010	Met with lead pharmacist of PMC and went through details of pharmacy services. Provided lecture about pediatric kinetics to Pediatric MDs.	Ramallah
Thursday, 8/26/2010	Rafidia Hospital – observed workflow and medication utilization of emergency department	Nablus
Friday, 8/27/2010	Worked on draft STTA report	Ramallah
Sunday, 8/29/2010	Worked on draft STTA report	Ramallah
Monday, 8/30/2010	Hebron – observed emergency department medication utilization	Hebron
Tuesday, 8/31/2010	PMC /Flagship Project Office – Gave lecture to pediatric physicians. Completed Debrief. Departed to Loma Linda.	Ramallah/Tel Aviv
Wednesday, 9/1/2010	Arrive	Loma Linda

## ANNEX C: CONSULTANT CV

### Mohammed S. Ghonim, Pharm D

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#### Professional Education

- Doctor Of Pharmacy, U.S.C. School of Pharmacy, CA, *May 2003*.

#### Undergraduate Education

- Bachelor of Science in Chemistry, University of La Verne (U.L.V.), CA, *May 30, 1999*.
- Minor in Biology, U.L.V., CA, *December 1997*.

#### Pharmacist Work Experience

- Loma Linda University Medical Center, *August 2006 – Present*.

**Director of Pharmacy Services** – (November 2008 – Present): Roles include oversight and development of pharmacy services and operations at various campuses, as well as the two adult and one pediatric oncology infusion clinics. Responsible for setting up systems to better control and account for narcotics used in the various surgical areas in the Medical Center, East Campus, Heart and Surgical Hospital and the Outpatient Surgery Center.

**Interim Medical Oncology Physician Group Administrator** (August 2008 – March 2009): Roles include managing physician billing, directorship agreements, and development of oncology service line. Help establish physician practice guidelines as well as improve patient access to physician group.

**Interim Executive Director – Cancer Center:** (August 2008 – March 2009): Roles include oversight of all cancer center operations and development. Expanded hours of service, which resulted in a 30% increase in number of appointments during the first month. Worked with team to develop a Symptom Management Clinic as part of the cancer center. Established processes to allow other oncology specialties to have their patients receive treatment in the cancer center's infusion clinic. Worked with team to develop a second infusion clinic in Beaumont, CA. Implemented processes which improved flow and patient safety as well as patient satisfaction. Implemented process which have significantly improved and streamlined our billing process (was able to recover over \$5 million in charges during the first month). Responsible for 70+ FTEs including research staff, nursing staff, medical assistants, pharmacy staff and front desk staff.

**Clinical Oncology Specialist/Lead Pharmacist** (April 2008 – March 2009): Roles include developing clinical pathways and order forms. Provide education to nurses, physicians and patients. Evaluate patients' symptom management medications and adjust out-patient regimens. Worked with engineers and architects to design both adult and pediatric infusion clinic pharmacies.

**Drug Education Coordinator** (August 2006 – April 2008): Roles include providing education on various subjects to pharmacists, nurses, and physicians. Worked on establishing prescribing guidelines for various medications (e.g. IV hydralazine, Epoetin alfa, Filgrastim, IVIG). Helped develop pharmacy protocols and procedures. Review formulary and dispensing processes and provide recommendations for cost minimization & process efficiency. Helped coordinate investigational medication protocols.

- *Committee involvement:* Noblis Design Team, Innovating Excellence Implementation Team, Diabetes Task Force, Patient Education Task Force, IV Medication Guidelines, Bronchiolitis Pathway, Pediatric Medication Safety Task Force, Food & Drug Interaction Committee, Patient Controlled Analgesia Task Force, Pain Management Committee, Febrile Neutropenia Committee, P&T Committee, Acute Stroke Team, Cancer Center development team, Anticoagulation protocol design team.
- Queen of The Valley Medical Center, West Covina, CA, *October 2005 – November 2007.*  
**Per Diem clinical pharmacist:** Roles included monitoring patient therapy and assuring that appropriate therapy is utilized based on patient specific parameters, initiating and adjusting doses of patient controlled analgesia, vancomycin, aminoglycosides, warfarin, heparin, and renally cleared medications.
- Kaiser Permanente, *June 2002 – August 2006.*  
**Outpatient Pharmacist:** Roles: Attended to patients' prescriptions. Monitored patient profiles for drug interactions and therapeutic overlaps. Communicated with physicians on therapeutic changes. Counseled patients on the proper usage of both prescription and over the counter medications. Reviewed and approved/rejected drug allergy/interactions. Processed prescriptions and obtained new and refill medications from physicians for patients.  
  
**Clinical Pharmacist:** Roles include monitoring patient therapy and assuring that appropriate therapy is utilized based on patient specific parameters, initiating and adjusting doses of vancomycin, aminoglycosides, warfarin, heparin, and renally cleared medications. Monitoring of TPN, levels of phenytoin, digoxin, phenobarbital, tegretol, theophylline, etc.  
  
 Worked with Infectious Disease physicians on establishing and streamlining antibiotic regimens. Initiated antibiotic surveillance protocol.  
  
**NICU/Peds Pharmacist:** Roles include monitoring electrolytes of patients, consulting with physicians on TPN, electrolyte, antibiotic and other drug therapies. Helped establish standardized drip concentration protocols and provided education courses for nursing staff, pharmacists and physicians.
- Pomona Valley Hospital Medical Center, Pomona, CA, *August 2003 – October 2005.*  
**Clinical Pharmacist:** Roles include monitoring patient therapy and assuring that appropriate therapy is utilized based on patient specific parameters, initiating and adjusting doses of TPN, vancomycin, aminoglycosides, and PCAs. Attended daily multi-disciplinary ICU/CICU rounds, and work closely with physicians to provide the most effective therapies. Worked with Infectious Disease physicians to establish protocols for antibiotic regimens for adult and pediatric patients. Established dosing guideline protocols for Pediatrics. Worked with NICU staff in establishing and implementing standardized drip concentration protocols.
- Pomona Valley Hospital Medical Center, Pomona, CA, *February 2003 – August 2003.*  
 Mini-Residency in Hospital Practice, emphasis in acute care.

#### **Intern Pharmacist Work Experience**

- Kaiser Permanente, Downey, CA, *June 2002 – August 2003.*  
**Duties:** Attend to patients' prescriptions and aid pharmacists in dispensing and filling medications. Monitor patient profiles for drug interactions and therapeutic

overlaps. Communicate with physicians on therapeutic changes. Counsel patients on the proper usage of both prescription and over the counter medications. Review and approve/reject drug allergy/interactions. Process prescriptions and obtain new and refill medications from physicians for patients.

- Walgreens Pharmacy, Anaheim, CA, April 2001 – March 2003.  
**Duties:** Attend to patients' prescriptions and aid pharmacists in dispensing and filling medications. Monitor patient profiles for drug interactions and therapeutic overlaps. Communicate with physicians on therapeutic changes. Counsel patients on the proper usage of both prescription and over the counter medications. Review and approve/reject drug allergy/interactions. Process prescriptions and obtain new and refill medications from physicians for patients.
- Walgreens Pharmacy Summer Internship Program, Phoenix, AZ, May 2001 – August 2001.  
Duties were same as above. Also, spent time focusing on disease state management of actual patients and review specific disease states that were common to the surrounding community such as diabetes, CHF, asthma/COPD.
- Kaiser Permanente, Outpatient Pharmacy, Bellflower, CA, July 2000 – December 2000.  
**Duties:** Same as Walgreens Pharmacy. Also, was responsible for maintaining inventory on C-II medications and compounding medications.
- Sav-On Pharmacy, Monterey Park, CA, October 1999 – December 2000.  
Duties were same as Walgreens Pharmacy.

#### **Non-Pharmacy Work Experience**

##### **Construction**

- M. I. Steel Fabricators, Los Angeles CA, January 1995 – August 2002.  
This is a *seasonal* occupation in which I was involved in field and shop steel construction work ranging from building automobile lifts to warehouse stores.

##### **Teaching Assistant**

- Chemistry Department, U.L.V., CA, January 1997 – May 1999.  
Responsible for lecturing, organizing laboratories, and preparing all chemicals, reagents and equipment needed for experiments.
- Biology Department, U.L.V., CA, January 1997 – December 1998.  
Responsibilities are same as in Chemistry Department.

##### **CRLA Certified Tutor**

- Learning Enhancement Center, U.L.V., CA, September 1996 – May 1999.  
*Subjects tutored:* General Biology, General Chemistry, Organic Chemistry, Advanced Organic Chemistry, Inorganic Chemistry, Analytical Chemistry, Physical Chemistry, General Physics, Calculus 1 & 2, and College Algebra.

##### **Research**

- Conducted research on potentially carcinogenic mutated guanosine at U.C.L.A., Department of Chemistry and Biochemistry under the guidance of Dr. C.S. Foote, *January 1998 – October 1998.*
- Conducted research on ischemic heart disease for the American Heart Association (AHA) at U.C. Davis, under the guidance of Dr. J.C. Longhurst, President of the AHA, *May 1997 – August 1997.*

##### **Presentations/Lectures**

- Monthly Nursing General Pharmacy Orientation. LLUMC, *October 2006 – Present.*

- “Patient Controlled Analgesia.” Series of lectures to Pharmacists and physicians in effort to help develop a hospital-wide system for PCA management. LLUMC. *March 2009 – Present*.
- Pediatric Physician Board Review – Pharmacology. *March 2008*.
- “Pharmacotherapeutics and pharmacokinetics of ICU medications.” National Critical Care Nursing seminar. LLUMC, *November 2007*.
- “Pharmacological management of Diabetes Mellitus.” (*Part of a continuing education program for nurses, pharmacist, and dieticians*). LLUMC, *November 2007*.
- “Acute Care Peds: The pharmacy.” Lecture to pediatric nurses, providing review of regulations that govern medication delivery and administration. LLUMC, *October 2007*.
- “Code Blue Medications.” Lecture to pediatric nurses, detailing medications used in emergency situations. LLUMC, *September 2007*.
- “Introduction to Pharmacy.” Lecture to Nursing Residents, covering dosing and monitoring of medications, Joint Commission regulations, and pharmacy related procedures. LLUMC *September 2007*.
- “Antifungal and Antiviral medications.” Lecture to Pediatric Medical Residents, covering appropriate selection, dosing and monitoring of antifungals and antivirals. LLUMC, *August 2007*.
- “Bad things caused by good drugs.” Lecture to Pediatric Medical Residents, covering common adverse effects of medications and their management. LLUMC, *August 2007*.
- “Taking Care of our kids.” Lecture to Pediatric Medical Residents, covering pediatric dosing, drug level interpretation, and Joint Commission regulations. LLUMC, *July 2007*.
- “Innovating Excellence: Changes in Pharmacy.” Presented to Steering Committee, LLUMC, *June 2007*.
- “Innovating Excellence: Care Management, Part II.” Presented to Steering Committee, LLUMC, *June 2007*.
- “Pharmacotherapeutics and pharmacokinetics of ICU medications.” National Critical Care Nursing seminar. LLUMC, *May 2007*
- “Innovating Excellence: Care Management, Part I.” Presented to Steering Committee, LLUMC, *March 2007*.
- “Acute Care Peds: The wonderful world of pharmacy.” Lecture to pediatric nurses, providing update on pharmacy process and review of commonly used medications. LLUMC, *March 2007*.
- “The Pharmacology of Diabetes Mellitus.” (*Part of a continuing education program for nurses, pharmacist, and dieticians*). LLUMC, *November 2006*.
- “Pharmacy 101.” Lecture to Pediatric Medical Residents, covering pharmacy workflow and responsibilities. LLUMC, *November 2006*.
- “Taking Care of our kids.” Lecture to Pediatric Medical Residents, covering pediatric dosing, drug level interpretation, and Joint Commission regulations. LLUMC, *October 2006*.
- “Pharmacology of Diabetes” (2 hour Nursing Continuing Education). Pomona Valley Hospital Medical Center, *June 2005*.
- “Self-Management of Type II Diabetes.” Pomona Valley Hospital Medical Center, *April 2004*.
- “Comparison of Therapeutic Options for the Management of Schizophrenia.” Ingleside Hospital, *February 2004*.
- “Treatment Options for Sexually Transmitted Diseases.” Kaiser Permanente, Sunset, *December 2002*.

- Series of Discussions about Diabetes, CHF and COPD at nursing homes, Pheonix, AZ August – September 2002.
- “Therapeutic options for drug resistant *Staphylococcus aureus*,” U.S.C./L.A.C. Hospital, August 2002.
- “Avinza: Drug Review,” Kaiser Permanente, Sunset, June 2002.
- “Synthesis of Guanosine-Guanosine Dyads and 8-oxo-Guanosine for Oxidative DNA Cleavage Studies.” Pfizer Pharmaceuticals, CT, October 1998.
- “The effects of exercise training, Endothelin-1, Nitric Oxide, U46619, and Acetylcholine on Ischemic Heart Disease.” American Heart Association, UC Davis, CA, August 1997.

### **Academic Honors, Awards, and Recognition**

- Phi Delta Chi Brotherhood Award, April 2001
- Nominated for Wendell Chow Award, U.S.C. School of Pharmacy, May 2000.
- Undergraduate Student Speaker, U.L.V. Commencement, May 30, 1999.
- **Top of U.L.V.’s Graduating Class of 1999.**
- Graduated with Departmental Honors in Chemistry, U.L.V., May 30, 1999.
- Inducted into Who’s Who Among Students In American Universities, May 1999.
- **One of twenty-one national** recipients of the Pfizer Summer Undergraduate Synthetic Organic Chemistry Fellowship Award, Summer 1998.
- Alpha Chi National Honor Society Inductee, (*California Theta Chapter*), March 1998.
- Departmental Award in Chemistry, U.L.V., April 1997.
- Leadership, Education and Development Award recipient, September 1996.
- BC Edmund Jaegar Biology Award, U.L.V., September 1996.

### **Professional Affiliations**

- Phi Delta Chi Professional Pharmacy Fraternity Alumni Association executive board member, October 2004 - Present
- Phi Delta Chi Professional Pharmacy Fraternity, U.S.C. October 1999 – Present.
- California Society of Health Systems Pharmacists (CSHP), September 1999 – Present.
- American Pharmaceutical Association (APhA), September 1999 – Present.
- Skull and Mortar Service Fraternity, U.S.C. September 2000 – May 2004.
- Associated Students School of Pharmacy (ASSP) officer, U.S.C. September 1999 – May 2004.
- California Pharmacists Association (CPHA), U.S.C. September 1999 – May 2004.
- American Society of Health Systems Pharmacists (ASHP), U.S.C. September 1999 – May 2004.
- Alpha Chi National Honor Society, May 1997 – May 2004.
- Associated Student Board, officer, U.L.V., April 1996 – April 1998.
- Leadership Education And Development, U.L.V., January 1996 – September 1997.

### **Leadership**

- Grove Home Owners Association – President, February 2005 – Present.
- Phi Delta Chi Executive Board member, October 2003 – October 2008.
- Phi Delta Chi Professional Pharmacy Fraternity – Vice President, U.S.C. School of Pharmacy, May 2000 – May 2001.
- Skull and Mortar Service Fraternity – Kid’s Day Chair Coordinator, U.S.C. School of Pharmacy, September 2000 – April 2001.
- Associated Students of the School of Pharmacy – Treasurer, U.S.C. School of Pharmacy, May 2000 – May 2001.

- Class of 2003 – President, U.S.C. School of Pharmacy, *May 2000 – May 2001.*
- Class of 2003 – President, U.S.C. School of Pharmacy, *September 1999 – May 2000.*
- **One of seven national** Student Representatives to Alpha Chi National Honor Society's National Council, *March 1998 – March 2000.*
- Chemistry Department Student Representative for Natural Science Division, U.L.V., *September 1998 – May 1999.*
- Society of Physical and Life Science Scholars – President, U.L.V., *May 1998 – May 1999.*
- Society of Physical and Life Science Scholars – Vice President, U.L.V., *May 1997 – May 1998.*
- Pre-Health Club – President, U.L.V., *May 1997 – May 1998.*
- Pre-Health Club – Vice President, U.L.V., *May 1996 – May 1997.*
- ASB – Freshman Class President, U.L.V., *September 1995 – May 1996.*

## **ANNEX D: BIBLIOGRAPHY OF DOCUMENTS COLLECTED AND REVIEWED**

The consultant should include a reference list of documents collected and reviewed for the purpose of this short-term assignment.

Flagship September-December Quarterly Report  
MoH Institutional Development Plan  
MoH Needs Assessment Report  
National Strategic Health Plan  
Orientation Packet  
Y1 Q4 (July-Sep09) Quarterly Report Draft  
Year 2 Annual Implementation Plan – Revised Feb 12, 2010  
Year 1 Annual Report Draft  
STTA Reports of NICU Team

## ANNEX E: LIST AND COPY OF MATERIALS DEVELOPED AND/OR UTILIZED DURING ASSIGNMENT

The consultant should include a reference list of materials that were used for this short-term assignment - whether previously available or newly developed. Copies should be provided via email or CD.

The following books and supplies with RH and PMC:

Item	Quantity
Wall Chart - Chemo	1
Wall Chart - Non-Chemo	7
PALS Algorithms - booklet	4
ACLS Algorithms - booklet	4
Pediatric Code Blue Sheets - booklet	3
NICU Code Blue Sheets - booklet	2
NICU Manual	1
PALS Algorithms - loose set	1
ACLS Algorithms - loose set	1
Critical Care Ad Mixtures - guide (2010-2011)	1
NICU TPN Order Form/Guideline	3
Pediatrics TPN Order Form/Guidelines	10
Adult TPN Order Form	10
Handbook on Injectable Drugs 11th Edition	1
Handbook on Injectable Drugs 12th Edition	1
Pediatric Dosage Handbook 13th Edition	1
Pediatric Dosage Handbook 15th Edition	1
Drug Information Handbook 18th Edition	1

The following electronic files and resources were left with the Flagship Project staff, pediatrics physicians at RH, PMC and Alia (Hebron), as well as Lead Pharmacists at RH and Alia (the various personnel to which these files were provided were given a brief one on one in-service on how to utilize these resources:

- A. Adult Clinical Pathways
  1. Acute Chest Pain
    - a. Low-Risk Chest Pain Algorithm
    - b. Low-Risk Chest Pain Clinical Pathway Scope
    - c. Low-Risk Chest Pain Template Observation Chart
  2. Acute Sickle Cell Disease
    - a. Acute Sickle Cell Disease Pathway
    - b. Acute Sickle Cell Disease Physician Order
  3. Anemia
    - a. Anemia Pathway Algorithm
  4. Asthma
    - a. Acute Asthma Algorithm
    - b. Acute Asthma Clinical Pathway

- c. Acute Asthma Severity Level
- 5. Chemotherapy Extravasation
  - a. Chemotherapy Extravasation Clinical Pathway
  - b. Chemotherapy Extravasation Physician Order
  - c. Chemotherapy Extravasation Timetable
- 6. Community Acquired Pneumonia
  - a. Community Acquired Pneumonia Algorithm
  - b. Community Acquired Pneumonia Clinical Pathway
  - c. Community Acquired Pneumonia Clinical Pathway Scope
  - d. Community Acquired Pneumonia Quality Measures
  - e. Community Acquired Pneumonia Table 1
  - f. Community Acquired Pneumonia Table 2
  - g. Community Acquired Pneumonia Table 3
  - h. Community Acquired Pneumonia Table 4
  - i. Community Acquired Pneumonia Table 5
- 7. ESA
  - a. Erythropoietic Stimulating Agents Algorithm
  - b. Erythropoietic Stimulating Agents Guideline
  - c. Erythropoietic Stimulating Agents Timetable
- 8. Febrile Neutropenia
  - a. Febrile Neutropenia Admission Order
  - b. Febrile Neutropenia Algorithm
  - c. Febrile Neutropenia Clinical Pathway
- 9. Orthopedics
  - a. Total Hip Arthroplasty Clinical Pathway
  - b. Total Hip Arthroplasty Post-Op Algorithm
  - c. Total Hip Arthroplasty Post-Op Reconstruction
  - d. Total Hip Arthroplasty Preadmission Algorithm
  - e. Total Knee Arthroplasty Admission Orders
  - f. Total Knee Arthroplasty Algorithm
  - g. Total Knee Arthroplasty Clinical Pathway
  - h. Total Knee Arthroplasty Post-Op Reconstruction
- 10. Severe Sepsis
  - a. Severe Sepsis Clinical Pathway
- 11. Sickle Cell Disease
  - a. Sickle Cell Disease Clinical Pathway
- 12. Therapeutic Post Cardiac Arrest Hypothermia
  - a. Therapeutic Post Cardiac Arrest Hypothermia Clinical Pathway
- B. Anticoagulation
  - 1. Argatroban Protocol
  - 2. Enoxaparin Guidelines
  - 3. Lepirudin and Argatroban Order Form
  - 4. Lepirudin Protocol
  - 5. Warfarin Monitoring Form
  - 6. Warfarin Order Form
  - 7. Warfarin Pediatric Protocol
  - 8. Warfarin Protocol
- C. Dose Calculator for NICU Code Blue

- D. General Guidelines
  - 1. Clinical Strategies
  - 2. GUH P&T Guidelines
  - 3. Tripler Army Medical Center Critical Care Medicine Services
  - 4. UCI Medical Center Guidelines
- E. IV Guidelines
  - 1. IV Medication Administration Guidelines
  - 2. IV Medication Administration Guidelines (List of Generic and Brand Name medication and who is to administer the medication)
- F. Lectures
  - 1. Antivirals and Antifungals
  - 2. Board Review: March 2008
  - 3. Common Drug-Related Medical Errors (Handout)
  - 4. Drug Allergies and ADR' s
  - 5. PCCNC (Pediatric Critical Care Nursing Core)
  - 6. Pediatric Emergency Medication
  - 7. Pediatric Dosing
  - 8. Pediatric PK
- G. Pediatric Clinical Pathways
  - 1. Asthma
    - a. Pediatric Asthma Clinical Pathway Scope
    - b. Pediatric Asthma Forms Packet
    - c. Pediatric Asthma Home Management Plan of Care (English)
    - d. Pediatric Asthma Pathway Implementation
    - e. Pediatric Asthma Patient Guide (English)
    - f. Pediatric Status Asthmaticus Clinical Pathway Scope
    - g. Pediatric Status Asthmaticus Forms Packet
  - 2. Bronchiolitis
    - a. Pediatric Bronchiolitis Clinical Pathway
    - b. Pediatric Bronchiolitis Forms Packet
  - 3. Diabetic Ketoacidosis
    - a. Pediatric Diabetic Ketoacidosis Clinical Pathway Scope
    - b. Pediatric Diabetic Ketoacidosis Education
    - c. Pediatric Diabetic Ketoacidosis Monitoring Tool
  - 4. NICU Sepsis
    - a. NICU Sepsis Antimicrobials
    - b. NICU Sepsis Clinical Pathway
    - c. NICU Sepsis Physician Order
  - 5. Sickle Cell
    - a. Acute Sickle Cell Disease Clinical Pathway
    - b. Pediatric Acute Sickle Cell Disease Physician Order
    - c. Sickle Cell Disease Clinical Pathway
  - 6. Hyperbilirubinemia Admission Order
  - 7. Hyperbilirubinemia Clinical Pathway
- H. Pediatric Medical Charts
  - 1. Antiarrhythmics
  - 2. Compatibility Chart I
  - 3. Cardio Compatibility

4. Diuretics
  5. Inotropes
  6. Medscape Chart
  7. NICU Compatibility Chart
  8. Other
  9. Vasodilators
- I. Rx References
1. Allergy Desensitization
    - a. Desensitization Protocols
  2. Anesthesia
    - a. Different Types of Anesthesia
    - b. Fentanyl Ropivacaine Bags
    - c. NICU Lab Values
    - d. Summary of ASRA Guidelines and Heparins
  3. Apothecary Metric Equivalents
  4. BMC
    - a. BR-205 Maximum Dose Guideline for antipsychotics
  5. CODE Blue Carts
    - a. Code Chart Record
    - b. NICU Medication Tray configuration
  6. Cytotoxic Oral Medications
    - a. Chemotherapy (Oral) Guidelines
  7. Dialysis
    - a. Peritoneal Dialysis Heparin Plus Antibiotics Memorandum
    - b. Dialysis Drugs (2007)
  8. Do Not Crush Do Not Chew
    - a. ISMP Oral Dosage Forms That Should NOT Be Crushed
    - b. Oral Dosage Forms That Should Not Be Crushed
  9. Epoetin Policy
    - a. Epoetin Alfa Policy
  10. HTN Urgency vs. Emergency
  11. IV Potassium
    - a. Policy M-115 IV Potassium
    - b. Potassium
  12. Neupogen Policy
    - a. Neupogen Order Entry Process
    - b. Neupogen Policy Memo
  13. NICU
    - a. 2005 NICU Resident Nutrition Guidelines
    - b. NICU Lab Values
    - c. NICU Medication Tray
  14. Pharmacy Orientation
    - a. Pharmacy Overview Presentation
  15. Standard Concentrations
    - a. Infusion Concentrations
  16. TYSABRI
    - a. Touch Tysabri
    - b. Tysabri Medical Guide

- J. Compounding Book Draft (how to prepare oral solutions from tablets)
- K. Pediatric Resident Standard IV Medication Concentrations
- L. Code Blue Sheet booklets with dose calculations
  - 1. Neonatal
  - 2. Pediatric

## STTA COMMUNICATIONS FORM

The Flagship Project is required by USAID to share success stories and where feasible implement communications and public awareness campaigns. The work of Flagship Project short-term consultants such as yourself constitutes much of our assistance to the West Bank and Gaza, and therefore should be a meaningful part of these campaigns. Please provide the information below for use in campaign materials (press releases, handouts, newsletters) to the Communications Specialist c/o Flagship (at [cnr@flagshipproject.org](mailto:cnr@flagshipproject.org)), within one day of your commencement of work in West Bank or Gaza. These press releases may or may not be published but they will be the seeds on which many of our outreach efforts will be based. We also find this is a good way to gear our consultancies in a results-oriented manner.

**Your Name:** Mohammed S Ghonim, PharmD

**Component Focus Area:** 1) Pharmacy Operations 2) Clinical Pharmacy Services 3) Medication Management 4) Medication utilization in the emergency department 5) Management of Critical Care patients

**Date of Consultancy:** August 16 – 31, 2010

1. Briefly describe the nature of the assistance you will provide in West Bank and Gaza:

Assess the current challenges which exist with pharmacy operations and medication management within the pharmacy department as well as on the wards and emergency department. For any and all obstacles realized, the challenges will be identified and recommendations for improvements will be made.

2. If you will participate in a seminar, conference, work shop or other event while in West Bank or Gaza, please describe your specific contribution (e.g. what you will speak about):

Where needed, educational lectures to health care providers on applicable topics will be presented. Discussions with current and future clinical pharmacists will be arranged, such that they are informed about the roles and responsibilities of the clinical pharmacist within a multidisciplinary health care team.

3. Can you provide a few sentences about any stories that need to be told about the work that you're doing or the changes you're seeing as a result of the Flagship Project efforts? Please include a few sentences herein. A member of the results, reporting, and communications team will follow up with you if there are any questions.

The recommendations being made with respect to pharmacy should be able to widen the "bottle neck" and allow for more efficient pharmacy services, ultimately resulting in better patient care. The idea of utilizing a clinical pharmacist as part of the health care team is becoming more widely accepted, and improving clinical pharmacy services will further assist physicians in providing better patient care.

4. Can you please share any noteworthy quotes or photographs?

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