# CHEMOTHERAPY SPILL MANAGEMENT POLICY: POLICY ANALYSIS

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## Abstract

**There are many different chemotherapeutic agents used in the treatment course of cancer patients. Chemotherapeutic agents have been classified as hazardous by the National Institute for Occupational Safety and Health. Chemotherapeutics agents are therapeutic agents which are known to be toxic to cells through their action on cell reproduction and are primarily intended for the treatment of neoplastic disorders. Chemotherapy agents have two unique features; the first is the low therapeutic indexes, which places patients at an increased risk for medication errors; the second, is they are considered hazardous drugs, which place patients and health care providers at risk for environmental exposure. Accidental spill of chemotherapy agents may occur during manufacture, transport, distribution, receipt, storage, preparation, and administration, as well as during waste handling and equipment maintenance and repair. As nurses and health care providers are involved in preparation and administration of chemotherapeutic agents, they may expose themselves to hazardous effects that have been reported in several studies.**

**Key words:** **policy, chemotherapy, spill, cancer, hazardous drugs.**

## Introduction

There are many different chemotherapeutic agents used in the treatment course of cancer patients (WHO, 2012). Chemotherapeutic agents have been classified as hazardous by the National Institute for Occupational Safety and Health (NIOSH, 2004). Chemotherapeutic agents are therapeutic agents which are known to be toxic to cells through their action on cell reproduction and are primarily intended for the treatment of neoplastic disorders (Amiruddin, 2002). Chemotherapy agents have two unique features; the first is the low therapeutic indexes, which places patients at an increased risk for medication errors, the second is they are considered hazardous drugs, which place patients and health care providers at risk for environmental exposure (Griffin, 2003).

Accidental spill of chemotherapy agents may occur during manufacture, transport, distribution, receipt, storage, preparation, and administration, as well as during waste handling and equipment maintenance and repair (Amiruddin, 2002). As nurses and health care providers are involved in preparation and administration of chemotherapeutic agents they may expose themselves to hazardous effects that have been reported in several studies.

Kyprianou, Kapsou, Raftopoulos, and Soteriades, (2010) reported that nurses and health care providers complain of acute symptoms related to exposure of chemotherapeutic agents such as skin irritation, sore throat, cough, dizziness, headache, hair loss, allergic reaction, diarrhea, nausea, and vomiting. Also, frequent abortion has been reported by health care providers who were exposed to chemotherapeutic agents (Martin, 2003; Kyprianou, et al. 2010); and disabilities in the offspring of nurses who handled chemotherapy during pregnancy.

Furthermore, Martin, (2003) and Smith, (2012) (?showed) in their studies an increased rate of certain cancers in health care providers (HCP), as a result of handling chemotherapeutic agents specifically, when mixing and administering these agents, accidental spills, sprays, chemo bag punctures and frequent contact with hazardous drugs.

Centers for Disease Control CDC (2010), confirm that chemotherapeutic agents continue to contaminate the work spaces where they are used, and in some cases it is still being found in the urine of those who handle them, despite knowledge of safety precautions. Also, the National Institute for Occupational Safety and Health (NIOSH, 2004) reports that exposure to chemotherapeutic agents have not been determined by a reliable method (NIOSH, 2004). Furthermore, in the United Kingdom, the Greater Manchester and Cheshire Cancer Network GMCCN, (2009 ) reported that the health care workers who are involved in the handling of chemotherapy drugs, and if not adequately protected, will absorb harmful quantities of these drugs through their skin. Health care institutions who use these agents developed chemotherapy spill policy to guide nurses and other health care providers in order to protect them from the dangerous health consequences that may result from spillage. Thus, it is significant to nurses, stakeholders, and administrators to review and analyze the chemotherapy spill policy.

### Purpose

The purpose of this paper is to review and analyze the chemotherapy spill policy in one tertiary care hospital (Islamic hospital) in order to identify issues and propose alternative solutions. Suggested alternatives will be discussed with regard to strength, weaknesses, administrative ease, cost, benefit, effectiveness, equity, legality and the acceptability of the policy.

### Islamic Hospital Background

Islamic hospital (IH) was established in 1982 in Amman as a private hospital. The total capacity of the hospital is 250 beds. Islamic hospital is considered the first teaching hospital in the Jordanian private health sector. Although, there are many oncology patients treated in IH, and chemotherapy management approach is considered one of the main procedures done to cancer patients, there is no special department for oncology patients, but there is a policy for chemotherapy spill management.

### Islamic Hospital Chemotherapy Spill Management Policy Description

The purpose of chemotherapy spill management in IH is to manage chemotherapy spill. This policy is applicable for all hospital staff. The purpose, scope, definitions, policy statement, responsibility, and procedure are clearly stated in the policy manual. Also, the policy steps are stated as following: (1) Chemotherapy spill kits to be kept in all departments where chemotherapy is administered; (2) Clean up is a nursing responsibility and second clean up will be performed by housekeeping; (3) If linen is involved in the spill place it in a double blue bag; and (4) If chemotherapy agent comes in contact with the skin, the area must be washed with a good amount of water and soap for at least 5 minutes. The implementation of the policy is the responsibility of the head of the department and the continuous education department.

## Verify, define and detail the problem

### Issue Statement

Does the chemotherapy spill policy in Islamic hospital provide a safe environment and prevent hazardous effects to health care workers?

### Scope of Problem

Exposure to chemotherapeutic agents may occur during preparation, administration, and disposal which may impose an occupational hazard for health care provider and workers (CNSA, 2003). The chemotherapy spillage not only affects the healthcare providers, but also, patients receiving chemotherapy and their family members, can also be exposed to the hazards of chemotherapy drugs when they handle contaminated equipment or body fluids (CNSA, 2003).

Research studies have identified chemotherapeutic agents in the urine of the workers and has negative genetic responses in the health care providers (Valanis, et al. 1993; Thomas, 2006). Hazards of exposure to chemotherapeutic agents can occur by various activities such as direct contact, when preparing, administering, cleaning, inhalation, storage and disposal of chemotherapy waste. Thomas, Melissa, & McDiarmid, (2006 ) and Polovich, (2004). In a study done by Mason (2003) to detect the level of the chemotherapy drug after collecting a sample from the outside of chemotherapy bags prepared in the pharmacy and delivered to nursing station for administration, Mason reported that when touching the bag of chemotherapy without proper chemotherapy protection equipment, exposed the nurses to chemotherapy. Mason also reported that no contamination was detected on the bag of chemotherapy when received from the pharmacy; the contamination happened in the pharmacy during preparation and the contamination was not seen by the nurses (Mas on, 2003). This shows the spillage may happen in any stage of preparation or administration.

Moreover, chemotherapeutic agents may be used for diseases other than cancer, such as Lupus, and multiple sclerosis (Polovich, 2004). In some hospitals these drugs are being administered by nurses without proper training or being chemotherapy certified which may increase exposure to chemotherapeutic agents for healthcare providers (Polovich, 2004).

### Health Impact

There are many adverse health problems caused by exposure to chemotherapeutic agents especially to health care providers who handle them or work in the surrounding setting of chemotherapy administration (NIOSH, 2007). Acute side effects of exposure to chemotherapeutic agents included skin irritation, sore throat, cough, headache, hair loss, allergic reaction, diarrhea, nausea, and vomiting (Kyprianou, Kapsou, Raftopoulos, and Soteriades, 2010; NIOSH, 2007).

Also, infertility, miscarriage, preterm labor, and frequent abortion have been reported by female health care providers who exposed to chemotherapeutic agents (Martin, 2005; Kyprianou, Kapsou, Raftopoulos, & Soteriades. 2010). In addition, disabilities were found in the offspring of nurses who handled chemotherapy during their employment (Martin, 2005). Furthermore, Fransman (2007) reported that health care providers who handled chemotherapeutic agents and are exposed to these agents took a longer time to have children than other health care providers who were not exposed to chemotherapeutic agents.

Many research studies confirmed that chemotherapeutic agents have been found in the urine of health care providers who handled chemotherapeutic agents, thus, there is an increased risk of cancer among health care workers (Wick, 2003; Connor, 2006; NIOSH, 2007). These findings raised the question of adherence to spillage policy or effectiveness of policy for safe handling of chemotherapeutic agents.

### Economic Impact

Chemotherapy has been administered in hospitals or clinics used to treat cancer patients via intravenous infusion and recently there has been an increase in the use of self-administration of oral chemotherapy at home. Although, using oral chemotherapy at home helps in decreasing the cost and use of health resources, it may increase the risk of exposure to chemotherapy spillage during administration if patients do not strictly adhere to safety precautions (Aisner, 2007; Weingart, Brown, Bach, & et al. 2008). Thus, compliance with strict policy and procedure is very important to prevent the potential health risk due to exposure, which may have a negative economic impact on patients and their families to manage the adverse effects of chemotherapy exposure.

There is a lot of expenditure on illness and injuries to health employees, families, and the surrounding environment. The impact may be financially and emotionally, which involves follow-up testing, treatment and anxiety and stress. The ultimate goal in any health care institution is to protect the staff from the risks of chemotherapy spillage that can leave them out of action for months, or even permanently. The International Labour Organization (ILO, 2003) estimated that the cost of global work - related injuries and illness accounts for 4% of the world's gross domestic product. Employers face costly early retirement, loss of skilled staff, and absenteeism, due to work-related accidents and diseases (Giuffrida, Lunes, & Savedoff, 2002). Also, Christopher Landrigan et al. (2004) reported that occupational hazard that results from unsafe workplaces affects the healthcare institution by increasing the cost and reducing ability to provide services. Moreover, Erinn and colleagues (2012) reported that reducing chemotherapy spillage by health care providers and workers can save more than 600,000 dollars every year in Canada. Thus effective implementation of chemotherapy drug spill policy will help decrease the cost, time and effort lost. Ultimately, decision makers must consider such costs as investment, not losing money. Health care institutions would have to value the significant expense to comply with this policy and the real cost must be weighed against the potential high cost of the treatment of the health care worker.

### Legal and Ethical Impact

From the ethical point view, health care workers do not wish to see unnecessary injuries or illness occurring (ILO, 2003). Ethical challenges in occupational health include issues related to privacy of employees's health information, balancing of cost and benefits, health screening, surveillance of employees, and employees adaptation to health protection programs and policy related issues (Rogers, 2012).

National Institute of Occupational Safety and Health (NIOSH, 2007) demonstrated that healthcare institutions have poor laws and regulations that examine and analyze the cause of chemotherapy spill issues and its sources, to prevent recurrence. Also, NIOSH assured that every health care institution must have a comprehensive safety program for controlling workplace exposure to chemotherapeutic agents that must include training, work practices, and personal protective equipment (NIOSH, 2004). Failure to maintain and provide the necessary equipment is a legal issue. Moreover, NIOSH, (2004) reported that reproductive risks have been associated with exposure to hazardous drugs and an alternative duty should be offered to individuals who are pregnant, or breast-feeding. All workers who handle hazardous drugs should be routinely monitored in a medical surveillance program (NIOSH, 2004).

Limited resources may stand as a barrier in the road of implementation of chemotherapy spill policy; this is a legal and ethical issue that may face health care professionals, thus it is a duty to all health care institutions to present all necessary resources to protect staff and patients from the side effects of chemotherapeutic agents. It is also the duty of the health care institution to develop strict measures to assess and

evaluate staff adherence to the policy and procedures who handled these chemotherapeutic agents, in particular, chemotherapy spill policy, otherwise it implies a legal and ethical behavior.

**Who is concerned? Stakeholders**

To discuss the issue of chemotherapeutic agents spillage, all stakeholders who have a direct or indirect relationship and are affected by the chemotherapy spillage issue, should be involved. The governments, healthcare institutions, healthcare professional/workers and medical industry should have a common interest, goal, and work together to achieve the intended goals.

Engaging with stakeholders, to develop well considered policy that reflects diverse perspectives in order to enhance the health and well-being of the people and prevent all unwanted negative effects of chemotherapy spillage, it has been necessary to develop a policy for preventive measures to be taken during the preparation and administration of chemotherapeutic agents and managing of chemotherapy spill during occurrence. In Jordan, each health care institution develops a policy to promote safety and ensure the quality of care. The decision makers (stakeholders) who should be involved in formulating the chemotherapy spill policy is a shared team that encompasses the government (Ministry of Health), health care providers and workers, medical industries, and the health care institution.

At the health institutional level, there is a need to adopt policies that respond to the needs of patients, health practitioners and other staff. It is the responsibility of the health care institution to maintain the physical environment; service coordination and continuity of care; multi-disciplinary collaboration and partnerships, patient and staff education and training; monitoring and measuring safe, quality and ethical services. During monitoring the application of policy by health care workers, is to encourage staff to report the incidents, not for disciplinary action but for identifying problems and finding solutions.

At the level of health care workers, building a stronger evidence base on ways to improve health care and the health system itself to achieve better health outcomes, satisfaction of policy and ensure adherence to standards of care; and public accountability for maintenance of professional standards achieves a culture of quality and system improvement and not destructive litigation and blame. Monitoring and addressing health care workers' concerns about health care quality is imperative. Also every health care worker is responsible in terms of policy application and should be acquainted with an advanced training and educational program that relates to chemotherapy usage to prevent occurrence of spillage and the ability to handle the spillage of chemotherapy in a safe manner according to the policy.

At the level of the government, a supportive health system will ensure that interventions implemented at the health institution, health practitioner and health consumer levels are effective and the performance evaluation systems have relevant policies. In addition there is a need to build a stronger evidence base on ways to improve health care and the health system itself to achieve better health outcomes, and ensure the strengthening of the monitoring of professional standards.

At the level of the medical industry, there are well-defined regulations for manufacturers and distributors to ensure safe transport and handling of chemotherapy drugs., although the initial step for safe handling of chemotherapy agents begins with the manufacturer. Follow up with new materials, resources and information regarding chemotherapeutic agents should be updated and provided to all stakeholders. The stakeholder's needs, services provided and desired outcomes are clarified in Table (1) (opposite page).

**Policy Analysis**

Before analyzing the current chemotherapy spill policy for Islamic hospital, I gathered information and resource materials such as policies from national and international health organizations. To identify the gaps in this existing policy, I consulted with the concerned staff in Islamic hospital to ensure that appropriate personnel protective equipment (PPE) was identified for use in the hospital and to identify issues in chemotherapy policy, in addition to searching for policy issues through books, publications, and research data, to develop solutions to the policy issue; the advantages and disadvantages of potential policy solutions; provide advice based on detailed analysis of the spillage issues; and generate recommendations to address the issue.

**Policy Evaluation**

In order to evaluate the chemotherapy spill policy we should identify the major missing factors that lead to occupational hazards at work place, then find the best alternatives that may strengthen the policy and protect the health care providers from hazards of chemotherapy spill exposure.

There are many problems during the evaluation process such as: lack of statistical data base, absence of national health information system regarding incident reporting, lack of information regarding the effectiveness of implementation of such policy on the health workers, and lack of sharing information among different health sectors. Thus, the governmental and private health sectors must work together in order to establish a national health statistical system, and national incident reporting system. This will help occupational health researchers; disseminate findings and recommendations, and establish unified training material. Also, this collaboration may help in minimizing

| Stakeholders | Needs | Services Provided | Desired Outcomes |
|---|---|---|---|
| Governments | Coordinate occupational health services with overall health services.<br><br>Ensure the establishment and application of chemotherapy spill policy. | Maintain employer responsibility for hazards and responsibility for access to health services and related policy. | More protection for health workers. |
| Healthcare institution | Correct implementation of available labor legislations.<br><br>Providing a safe environment through purchasing the appropriate personnel protective equipment.<br><br>Introduce new technology related to chemotherapy. | Ensure attendance of the education and training courses of all health care workers who deal with chemotherapy<br><br>Strengthen professional expertise in occupational health. | Promote satisfaction of healthcare workers. |
| Healthcare professional/workers | More protection of workplace hazards, and participation in education and training program.<br><br>To receive proper compensation including treatment expenses in case of exposure to hazards.<br><br>Include housekeepers in training courses. | Application of safety measures and precautions during manipulation of chemotherapy. | Safe work environment. |
| Industry (chemotherapeutic agents factories) | Adding new technology to develop safety and security measures in production and transporting materials<br><br>To cooperate and consider the reports from the service data analysis. | Maintain high technical procedures during production, storage.<br><br>Limited public access to chemotherapy materials. | Safer chemotherapy containers.<br><br>Less incidents of spillage. |

**Table 1: Stakeholder of Chemotherapy Spill Management Policy**

| Alternative | Effectiveness | Legality | Ease of application | Equity | Cost effectiveness | Political acceptability |
|---|---|---|---|---|---|---|
| Education and training | Highly effective | Legal | Easy | Yes | Depend on level and type of training | Acceptable |
| The operation of safe working practices | Effective | Legal | Easy | Yes | Effective | Acceptable |
| The use of medical devices which incorporate protection safety features. | Effective | Legal | Not easy | Yes | Depends on resource available | Acceptable |
| Medical surveillance | Effective | Legal and ethical | Easy | yes | Expensive | Acceptable |
| Support key research in public health systems, occupational health policy. | Effective | Legal | Easy | Yes | Depends on resource available | Acceptable |

**Table 2: Alternative solution**

the number of injured health workers which is the main goal of spill management policy. Occupational health and safety legislation must be frequently reviewed and updated accordingly.

### Alternatives

The most important issues are the lack of training and educational programs for the health workers; poor or absence of safe working practices; personal protective equipment (PPE); technology use; medical surveillance and research support. Training and educational programs are one of the most important alternatives that should be implemented. All mentioned proposed alternatives will be evaluated in terms of administrative ease, cost and benefits, effectiveness, equity, and legality.

Table (2) summarizes the alternative solutions that may help in controlling and minimizing health hazards associated with chemotherapy spillage.

### A. Training and Education

Effective training and education regarding related precautions is an important aspect in dealing withworkplace hazards. Such training should be incorporated in all relevant educational programs for healthcare employees. Personnel who are relatively new to the healthcare environment are amongst those most at risk. Performing continuous follow-up and development of occupational health and safety is a very important step. Conducting of regular refresher training courses may help experienced healthcare workers, who have developed a negative attitude and consider such risks as normal and expected, to change their behavior. Such educational programs should clearly focus on risks of exposure based on strong evidence from research findings.

Staff with minimal experience or no experience may be responsible for handling hazardous drugs in units or areas that do not normally care for cancer patients with chemotherapy management. Specific training is required to prepare those staff before assigning them to such a procedure (Brown et al., 2001). In the case of staff shortage, administrators and supervisors must provide appropriate and qualified staff who are able to accomplish the new assignment safely. When chemotherapy administration is an exclusive service, such as in

| Subject | Strength | Weaknesses | Need |
|---|---|---|---|
| Purpose | Clearly stated, to manage chemotherapy spill | | |
| Scope | Clearly stated, for all hospital staff | | |
| Responsibilities | Clearly stated: clean up spills is the nursing responsibility and the second clean up will be by house keeping | Not all hospital staff are trained to manage spill of chemotherapy | Training for all hospital staff |
| Spill kit | | Access the nearest spill kit | Spill kit should be available in each department |
| PPE | | Using face mask<br>Using disposable gloves | A respirator mask<br>Nitrile gloves |
| Setting | | Administering chemotherapy in any patient's room | Needs special room |
| Biological Safety Cabinets | | Mixing chemotherapy agents in medication room | Chemotherapy drugs compounded in the Pharmacy .<br><br>Mixing chemotherapy in a Class II biological safety cabinet. |
| Compounding Techniques | | Not stated in the policy | Care must be taken to avoid puncturing of gloves and possible self-inoculation. Remove all hand jewellery .<br><br>Syringes and I.V. sets with Luer-lock fittings should be used |

**Table 3: Strength and weaknesses of Islamic hospital chemotherapy spill policy**

oncology infusion areas, providing fully cross-trained staff can be problematic (Polovich, 2004).

When new information becomes available, it should be provided immediately to employees. When a different job assignment involves new risks, the employee should receive fresh training and information about the hazards. Performing prevention programs to prevent hazards is a primary prevention strategy (Polovich, 2004). Also, each healthcare facility should have an effective reporting system in order to be able to assess the level of illness and injuries related and to measure the benefits of preventative measures taken.

### B. Safe Working Practices

Each health care facility should establish policies and associated procedures to reduce the incidence and severity of the health risks that the health care professional may

| Action to be taken/ Expected outcome | Who | When | Resources |
|---|---|---|---|
| Training program | | | |
| Provide safe practice | | | |
| Using research | | | |
| Using technology | | | |
| Medical surveillance | | | |

**Table 4: Develop an action plan to implement the selected alternative. An action plan identifies tasks, timelines, resources, and responsibilities**

| | |
|---|---|
| ***Packaging and segregation*** | ▪ Effective packaging and segregation techniques should be used to avoid contamination prior to distribution.<br>▪ Packaging should clearly state whether segregation techniques have been used so that individuals unpacking the medications can take additional precautions if necessary.<br>▪ Packaging material should be durable, and able to contain any accidental leakage during handling and transport.<br>▪ Package label should indicate that the agent is cytotoxic.<br>▪ Distributors should ensure that the labeling on the packaging is intact and that oral chemotherapeutic agents are stored and transported separately from non-chemotherapeutic agents |
| ***Educational materials*** | ▪ Manufacturers should provide educational material regarding safe handling to each stakeholder, including physicians, RNs, pharmacy personnel, patients, and caregivers.<br>▪ Manufacturers should update patient education materials as new information becomes available. |

**Table 5: Recommendations for Manufacturers and Distributors**

encounter if there is no clear policy to be followed. Training and education of staff needs to be reinforced with working policies and procedures that are implemented in day -to-day routines. Also, a healthy working environment and safety activities should be maintained. Cooperation and collaboration should be maintained among employers and health care providers. Health care professionals have the right to participate in decisions concerning their own work, particularly, concerns about occupational health and safety.

**C. Technology Use**

Improved education, training and attention to working practices cannot alone eliminate injuries. However, medical device technology exists today to protect medical staff from unintentional injuries. Medical devices are available with additional safety features to prevent injuries.

**D. Medical Surveillance**

All workers who handle hazardous drugs should be routinely monitored in a medical surveillance program (ASHP, 2006). Medical surveillance involves the collection and interpretation of data for the purpose of detecting changes in the health status of working populations (ASHP, 2006). Medical surveillance programs involve assessment and documentation of symptom complaints, physical findings, and laboratory values (such as a blood count) to determine whether there is a deviation from the expected norms. Limited resources may preclude the implementation of a comprehensive medical surveillance program for health care workers who are exposed to hazardous drugs. In

| | |
|---|---|
| **Storage** | ▪ Proper storage and handling of chemotherapeutic agents should be ensured by health care professionals in order to prevent accidental exposure.<br>▪ Chemotherapeutic agents should be stored in a designated area per the manufacturer's instructions, and separate from non-chemotherapeutic agents.<br>▪ Some agents are air-moisture, and/or light-sensitive; therefore, storage specifications should be followed. |
| **Handling** | ▪ Correct use of personal protective clothing and equipment should be instituted to minimize exposure and health risks.<br>▪ Disposable gloves should be used for dispensing. Hands must be washed before and after glove application.<br>▪ Limit additional handling of hazardous medications by other health care professionals.<br>▪ Health care professionals who store chemotherapeutic agents must have a written plan in the event of a spill or accidental exposure. It is recommended that annual spill simulation exercises be conducted. |
| **Disposal** | ▪ All disposable protective clothing and materials used while handling chemotherapeutic agents should be disposed according to the waste disposal guidelines.<br>▪ All non-disposable materials exposed to chemotherapeutic agents including trays, tools, surfaces, etc should be washed or decontaminated thoroughly after use. |
| **Training** | ▪ Health care professionals should attend orientation programs and routine training courses specific to their roles, and should complete competencies associated with these training programs.<br>▪ A primary educator within a health care institution should be established as a source of referral and continued education on chemotherapy for health care professionals, allowing for consistent education, training, and monitoring.<br>▪ Health care workers involved in the handling of chemotherapeutic agents should be trained and competent to treat individuals accidently exposed to chemotherapeutic agents and on the disposal of chemotherapeutic agents.<br>▪ All clinical staff who are likely to come in contact with chemotherapeutic agents or with waste from patients who have received these agents (e.g. clerks, hygiene workers, and sanitation workers) should undergo appropriate training. |

**Table 6: Recommendations for Health Care Provider**

the absence of an institutional medical surveillance program, workers are encouraged to inform their personal health care providers of their occupation and possible hazardous drug exposure when obtaining routine medical care (ASHP, 2006).

**E. Research Support**

Governments are responsible and have the authority to develop policies, guidelines, and to control work hazards by offering resources in order to prevent occupational health hazards. Also, the government is responsible for establishing a national health information center to provide knowledge and information related to occupational health hazards to deal with chemotherapeutic drugs in different stages of handling.

## Discussion

Many chemotherapeutic drugs and other hazardous agents used in the treatment of cancer patients pose a clear health danger to healthcare

| | |
|---|---|
| 1. | Use gloves if possible and wash hands thoroughly before and after glove application. |
| 2. | Use separate devices for chemotherapeutic agents |
| 3. | Keep information ready for necessary action in the event of accidental exposure (including emesis and accidental ingestion). |
| 4. | Wash the patient's clothes and bed linen separately from other items |
| 5. | Double-flush the toilet after use, during use of and 4 to 7 days after discontinuing chemotherapy. |
| 6. | Do not leave medication in open areas, near sources of water, direct sunlight, or where they can be accessed by children |
| 7. | Do not store medications in the areas where food or drinks are stored or consumed |
| 8. | Do not discard medication down the toilet or in the garbage. |

**Table 7: Specific Recommendations for Patients and Caregivers**

workers who deal in preparation and administration of these agents as well as the disposal of resulting waste products (Polovich, 2004; Gambrell, 2006). Adopting safe-handling practices, including the use of personal protective equipment, engineering controls, and other new systems for safely preparing and administering these agents, can help minimize the risk of exposure to workers involved in drug therapy (NIOSH, 2004).

Martens, and Suh-Priest (2007) reported that oncology nurses who are responsible for containment of spills during chemotherapy administration have knowledge deficits and the need for practice changes. It was found that the current chemotherapy policy was outdated and needed to be revised. There are too many proposed solutions that significantly reduce the risk of exposure to chemotherapy which include developing training and educational programs; establishing appropriate policies and working procedures; using available protection technologies and building solid base knowledge from related research. Ongoing training in the safety of handling hazardous materials is required for all involved personnel, which may reflect a job satisfaction that may prevent the causes of spillage problems.

The cost to the health services when implementing effective chemotherapy drug spill policy will decrease. Decision makers must consider such costs as value adding not losing money. Healthcare institutions would have to consider the expense to comply with this policy because the cost of the consequences of chemotherapy spillage on employee is more (ILO, 2003; Giuffrida, Lunes, & Savedoff, 2002). There is a clear legal and ethical obligation on employers to anticipate and manage risk, and to provide safe working conditions and equipment for healthcare workers.

This paper only proposes brief of alternative ideas to reduce hazards of chemotherapy spill in the work place. Beyond the ethical considerations, there is a growing body of law that requires employers to combat risks at source. This paper may help and influence the development of further intervention strategies or further research to find alternative strategies for reducing such hazards of chemotherapy spill. Every healthcare institution must establish chemotherapy spill management policy and related procedures to protect the institution and their employers from health, economic and legal issues that may arise. Periodic evaluation of the chemotherapy spill policy may help in identifying the gaps that may lead to potential risks and help in preventing these hazards.

**Implementation, Monitoring and Evaluation**

The purpose of this policy analysis is to review and analyze the chemotherapy spill policy of the Islamic hospital and provide them with information, and findings of the related policy analysis, which help for potential change. In the policy implementation phase, it is important to evaluate alternatives, and choose the best alternatives to attain the desired goals.

The recommendations are intended to be applied to all departments in Islamic hospital who are involved in handling chemotherapeutic agents and may be exposed to hazards through chemotherapy spillage. Islamic hospital stakeholders should have access to the proposed recommendations. I will disseminate the report to relevant stakeholders. Few changes need to be added or modified to guide practice and policy change.

Monitoring the effectiveness and consequences of the policy is required to consider how it is operating and whether it is achieving the desired results. Evaluation of policy seeks to relate and assess the connections between actual policies and changes in the areas they are supposed to be influencing. Islamic hospital and other health care institutions are highly concerned about developing and reviewing chemotherapy policies and procedures that may affect the health of employers.

Based on policy analysis process, the suggested plan will include the following actions: (1)

- Increase awareness and perception of the stakeholders

about the chemotherapy spill policy and procedure based on research through workshops, and disseminating of recommendations, (2)

- Recommend to designate a multidisciplinary committee of health professionals for assuring compliance with the chemotherapy spill policy and procedures (3)
- Raise the issue of legislation regarding chemotherapy to all concerned governmental and nongovernmental organization.

## Recommendations

A number of stakeholders are involved in handling chemotherapeutic agents at various stages. Recommendations for safe handling by these stakeholders are outlined in the following sections.

### 1. Manufacturers and Distributors

There are well-defined regulations for manufacturers and distributors to ensure safe transport and handling of chemotherapy drugs, although the initial step for safe handling of chemotherapy agents begins with the manufacturer.

Appropriate packaging could minimize the handling of chemotherapy drugs by health care providers and patients, thus contributing to safer handling. This includes clear labeling on the outside of the package indicating that the agent is cytotoxic. Additional recommendations for manufacturers and distributors are listed in Table 5. Health care professionals are encouraged to reinforce the importance of these points to stakeholders and regulatory agencies whenever possible.

### 2. Health Care Providers

Health care providers have a major responsibility in ensuring safe handling of chemotherapeutic agents. Because of the significance of this responsibility, health care providers should be appropriately trained, ensure that their knowledge is current with developments in the field, and follow all applicable discipline-specific guidelines when handling chemotherapeutic agents. See other recommendations in Table 6.

### 2. A. Training.

Health care professionals should attend orientation programs and routine training courses specific to their roles. They should also complete competencies associated with these training programs, along with an accompanying assessment for licensing qualification if applicable. The training programs should be approved by an oncology organization or appropriate local organizations.

In addition, within a health care institution, a primary educator should be established as a source of referral and continued education for training health care professionals on chemotherapy. This would ensure that patients receive consistent education, training, and monitoring across the multidisciplinary team.

Health care workers should be trained and competent to treat individuals accidently exposed to chemotherapeutic agents and on the disposal of cytotoxic medications. All clinical staff who are likely to come in contact with oral chemotherapeutic agents or with waste from patients who have received these agents (e.g. clerks, hygiene workers, and sanitation workers) should undergo appropriate training. The latter point of training non-health care professional staff was important because this recommendation is not included in the Islamic hospital policy. A list of training recommendations for health care providers is shown in Table 6.

### 2 B. Storage and Handling.

When handling chemotherapeutic agents, health care providers must adhere to good practice as defined by procedures manual and policy. Key recommendations are outlined in Table 6.

Minimize or eliminate any role of pregnant staff in handling chemotherapy agents. Clean non-disposable materials exposed to chemotherapy drugs. This includes trays, tools, and surfaces. Cleaning of the tools and surfaces exposed to these agents has been limited to washing the items and area thoroughly with soap and water, 70% alcohol, or sodium hypochlorite; in some settings, no cleaning occurs. The risk for contamination of other medications and patient exposure could be significant.

### 2 C. Patient Counseling

Health care professionals should provide patients and caregivers with education and training to ensure their understanding of safe handling procedures as well as thorough knowledge of proper administration of all medications. Patient literature and other educational materials should be monitored and evaluated to ensure that current and accurate information is being delivered. Clear dosing instructions should be provided, including what to do when a dose is skipped or when vomiting of a dose (spillage) occurs.

During refill of prescriptions, any potential medication and food interactions must be reassessed and discussed with the patient or caregiver. The patient should be made aware of the required monitoring arrangements by being provided with access to the written protocol and treatment plan from the institution where the treatment was initiated. Patients who are pregnant or breast-feeding should be counseled on recommended medications and their risk-benefit profiles.

### 3. Patients and Caregivers

Recommendations for patients and caregivers are included in Table 7. Caregivers should understand all information given to patients, including the transport, storage, dispensing, and disposal requirements to ensure safe handling.

They must work with the patient and health care provider to ensure

appropriate dosing for patients in their care and report any treatment-related adverse effects. Caregivers who are pregnant or breast-feeding, or children, should not handle any chemotherapy agents or waste products. Finally, to further ensure the safety of these individuals and others in the patient's home, guidelines from Australia and Canada recommend that patient's clothes and bed linen be handled with gloves and washed separately from other items and that toilets be double-flushed after use, during and four to seven days after discontinuing chemotherapy. Because drugs may be eliminated from the body as active or inactive metabolites in sweat, saliva, urine, or stool for five to seven half-lives, these recommendations were important and should be implemented.

These recommendations are adopted from the American Society of Health Systems Pharmacists: ASHP guidelines on handling hazardous drugs, 2010.

## Conclusion

A lot of health care professionals and workers are exposed to hazardous agents on a daily base, and many of them seriously injured. Several measures and efforts can be done to reduce such risks factors that lead to such hazards. In this paper, I identified gaps in existing policy for the safe handling of spilled chemotherapeutic agents. This paper only proposes some alternative ideas to enhance and eliminate the factors that influence the reduction of chemotherapy spill. First, the proposed recommendations are relevant to multiple stakeholders, beginning with the manufacturer. In addition, this recommendation has been developed based on international policy and best practices, and compiled to fill the gaps in existing policy. Therefore, these recommendations may help health care institutions to change or reshape their chemotherapy spill policy to maintain safe handling of chemotherapy to health workers and practices.

All stakeholders should follow established guidelines when handling chemotherapeutic agents and continually review and assess their standards and compliance with agreed procedures. This paper may influence the development of further intervention strategies or further research to find alternative strategies for reducing spillages of chemotherapeutic agents that are aimed to prevent, or at least reduce, the occupational hazards in the future. In addition, all facilities that handle chemotherapy agents should evaluate the policy and practice annually or as necessary. The major implementation strategies are to enhance training efforts, modify standardization and support related research, and sharing recommendations at national level and improving the quality of the medical industry related to handling chemotherapeutic agents, as well as in the work place, is important.

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