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# INSULIN NEEDLE USE AND DISPOSAL PILOT EVALUATION REPORT

## GUYANA SAFER INJECTION PROJECT

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This report contains the findings of interviews, observations and record reviews conducted by Initiatives Inc. to assess insulin needle use and disposal in Guyana. The report was prepared under the auspices of the Technical Assistance and Support Contract (TASC2 Global Health), implemented by Initiatives Inc. under Task Order No. GHS-I-02-03-00040-00 with the U.S. Agency for International Development.

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## Abbreviations

<b>ADA</b>	American Diabetes Association
<b>GPHC</b>	Georgetown Public Hospital Corporation
<b>GSIP</b>	Guyana Safe Injection Project
<b>GUYSUCO</b>	Guyana Sugar Company
<b>HMD</b>	Hindustan Syringes and Medical Devices Limited
<b>IDF</b>	International Diabetes Federation
<b>MOH</b>	Ministry of Health
<b>NA</b>	New Amsterdam Hospital
<b>PEPFAR</b>	The President's Emergency Fund for HIV/AIDS Relief
<b>PVC</b>	Polyvinyl Chloride
<b>USAID</b>	United States Agency for International Development
<b>USD</b>	United States Dollars
<b>WDH</b>	West Demerara Hospital
<b>WHO</b>	World Health Organization

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Pilot implementation was carried out by GSIP staff and two GSIP regional consultants, Marva Hawker in regions 3 and 4 and Maureen TenPow in region 6. GSIP is grateful for the time and effort Marva and Maureen put into the supervision of pilot activities and to the many hours they spent identifying clients willing to be visited at home, arranging home visits and traveling to clients home. They demonstrated great sensitivity and kindness toward facility staff and clients and were an important resource for all.

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## I. Executive Summary

In quarter two of 2007, GSIP conducted an assessment of insulin home use to determine the safety of insulin needle use and disposal among insulin-using diabetics (GSIP, 2007). The assessment found that diabetics routinely dispose of insulin needles with ordinary garbage, in household pits or latrines, or in neighborhood trenches.<sup>1</sup> Clients received little or no counseling or other information on safe insulin needle use and disposal. No systems were available for returning used insulin needles to facilities for disposal. Government facilities do not record distribution of insulin needles and shortages were common in all sites. 82% of clients interviewed said they reused needles, with the average number of uses at 3.3 times.

To address these issues, GSIP conducted the Safer Insulin Needle Use and Disposal Pilot. The principal purpose of the pilot was to conduct operations research to help identify viable approaches to improving the safety of insulin needle use and disposal. The pilot focused on three government hospitals and two GUYSUCO clinics. It ran from January 15 through June 30, 2008 and aimed to improve counseling, test out insulin syringe disposal containers, test out systems for needle return to clinics and test out options for full needle supply to clients.

Four methods of disposal were tested out in the Pilot: 2.5 liter safety boxes, a needle clipper, empty tablet containers sourced from hospital and clinic pharmacies, and client-sourced containers. GSIP also provided government pilot sites and GPHC with enough syringes to supply each insulin user with a single syringe for each injection. Clients were issued containers and syringes or instructed to source containers during routine diabetes clinic visits. They were advised to return their containers to the clinic at the next monthly visit or sooner if the container reached  $\frac{3}{4}$  capacity before the next clinic date.

The evaluation results suggest that nurses and pharmacists provided counseling and that it was effective. Nurses and pharmacists were willing to take on counseling tasks, were capable of providing quality counseling with the assistance of job aids, and did not find that counseling presented a significant work burden. 95% of the seventy-five clients interviewed said they received counseling on safe needle use and disposal. 97% said the nurse or pharmacist explained to them how to use the disposal container. 100% of clients said the pharmacists explained why he or she was giving the specified number of needles. All (100%) reported receiving messages on needle disposal.

All disposal containers tested were assessed to be safe. GSIP staff and regional consultants observed seventy-seven disposal containers in client homes. Of these, 94% were kept in places safe from child tampering and 96% were sufficiently isolated from other household objects. Only six containers (8%) were observed to be more than  $\frac{3}{4}$  full and none (0%) were observed to have punctures, to be leaking fluid, or to be emitting offensive odors.

Across the board, clients were highly satisfied with the insulin needle disposal systems, including containers and return procedures. Clients rated the usability of methods between 4.2 and 4.5 out of 5, suggesting little difference in the assessment of disposal methods. Return of containers

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<sup>1</sup> In Guyana, trenches are canals that run through residential, commercial, agricultural and industrial areas to channel water and prevent flooding. Children often swim or play in canals.

to health facilities was, in general, better than expected. However, return to GPHC was significantly poorer than other sites.

Clients appreciated receiving a syringe for each injection. All (100%) of the seventy-five clients interviewed said they liked receiving a full supply of syringes. 51% of clients said they liked having a needle for each injection because it was less painful or caused less bruising. Others said they felt better protected from infection. The provision of a full supply of insulin needles reduces re-use. Only six (8%) clients interviewed during the course of the pilot and immediately following the conclusion of the pilot program said they had re-used an insulin needle in the last month. This is a significant decline from the pre-pilot Insulin Home-use Assessment which found that 82% of clients re-used insulin needles.

All (100%) of the twenty-five nurses, pharmacists and waste handlers interviewed felt the program for safer insulin disposal and needle use should continue.

Empty tablet containers emerged as the preferred and most cost effective option, but the issue of shortages needs to be addressed. Providing a full supply of insulin needles to each diabetic client will require an additional \$193,991 USD to implement, but is desired by clients.

In short, the Safer Insulin Needle Use and Disposal Pilot was well received and appreciated by staff and clients who would like the program continued. Facility return of used insulin needles is feasible in a cost effective manner and should be made available to all clients.

## 2. Recommendations

**Facility-based insulin needle disposal systems:** Facility-based insulin needle disposal systems should be continued in pilot sites and rolled out to other key sites.

**Empty tablet container disposal system:** The distribution of empty tablet containers to clients for safe insulin needle disposal should be adopted. Clear systems need to be put in place for the collection and allocation of empty tablet containers from the pharmacy to clinics at sites that have tested out other options (such as NA).

**Client sourced container back-up systems:** At all sites, guidelines for client-sourced containers and procedures for counseling clients need to be implemented so staff can provide appropriate guidance should tablet containers run short.

**Full insulin needle supply:** MOH and private hospitals and clinics should consider providing a full supply of insulin needles to clients to reduce re-use and the associated pain, scarring and infection risks that accompany re-use. A system for providing full supply should be accompanied by safe needle return to facilities to ensure that the volume of sharps in communities does not increase.

**Counseling:** Counseling provided by nurses and pharmacists on safe insulin needle use and disposal should be continued. Client counseling is an essential component of safe needle use and disposal programs for insulin-using diabetics. Counseling does not add significantly to

provider workload and, when appropriate training and job aids are provided, can be carried out to a high standard.

**Counseling Guidelines:** The counseling guidelines for safer insulin needle use and disposal should be edited to reflect the disposal method adopted by MOH, if adopted, and should be integrated into the Ministry's National Guidelines for Control and Management of Type 2 Diabetes.

**Staffing:** If facility-based insulin needle disposal is implemented using empty tablet containers, staff responsibilities for collecting, organizing and distributing containers should be documented and adequate staff should be made available at peak clinic hours to implement the program effectively.

**Job aids and IEC materials:** The use of simple flyers with safe insulin needle use and disposal messages and with information on self-sourcing containers was effective and should be continued by MOH if possible.

**Research Insulin Prescription Practices:** The reasons for broad variations in prescription practices among sites remain unclear. The Ministry of Health should consider conducting an assessment of insulin prescription practices. Such an assessment would require the review of patient records by clinically trained staff who could assess if insulin prescription is warranted and if prescription practices are following standards.

**Diabetes Control:** The Ministry of Health should expand efforts to promote diabetes control to reduce, to the greatest extent possible, the number of people who require insulin. Investments in nutrition education, exercise promotion, and diabetes awareness and management counseling, if they result in the reduction of the number of diabetics on insulin, can reduce the long-term costs of insulin and insulin syringe provision and decrease the number of needles in households.

### 3. Introduction

The PEPFAR-funded Guyana Safer Injection Project (GSIP) aims to improve public health by reducing the number of unnecessary and unsafe injections. Unsafe injections contribute to the transmission of HIV and other blood borne disease through accidental sharps injuries. GSIP's strategy is focused on three approaches to reducing unsafe injections 1) reducing unnecessary injections and 2) increasing the demand for oral medications and 3) reducing community exposure to used needles and syringes.

Insulin-using diabetics are a key population of injectable medication users in Guyana. There are an estimated 51,800 diabetics in Guyana in 2008 – amounting to approximately 4% of the population.<sup>2</sup> The number of diabetics using insulin in Guyana has not been fully assessed; the GSIP insulin home-use assessment found between 25% and 44% of diabetics receiving services at three public hospitals were on insulin.<sup>3</sup> Diabetes is the 4<sup>th</sup> leading cause of death in Guyana, responsible for 7.7% of deaths per year.

In quarter two of 2007, GSIP conducted an assessment of insulin home use to determine the safety of insulin needle use and disposal among insulin-using diabetics (GSIP, 2007). The assessment found that, for lack of safe disposal options, diabetics routinely dispose of insulin needles with ordinary garbage, in household pits or latrines, or in neighborhood trenches.<sup>4</sup> Government facilities do not record distribution of insulin needles and shortages were common in all sites. Insulin users who collected needles from government hospitals were given an average of fifteen needles per month, with some provided as few as five per month. As a result, 82% of clients interviewed said they reused needles, with the average number of uses at 3.3 times.

Following the guidelines of the American Diabetes Association (ADA), the International Diabetes Federation (IDF) and The World Health Organization (WHO)<sup>5</sup>, GSIP promotes single use of insulin syringes. Considerations of insulin injection safety almost universally focus on potential risks to the insulin user; however, in its assessment of insulin home-use GSIP found that 46% of clients interviewed receive assistance injecting their insulin from a friend or family member and 33% receive help from others to dispose of their used insulin needles. While the risks of insulin needle reuse to clients and their families are not fully known, the substantial

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<sup>2</sup> The estimated number of 51,800 diabetics in Guyana in 2008 is calculated based on data provided by the Minister of Health, Leslie Ramsammy in 2006. In his World Diabetes Day speech of November 14, 2006, Dr. Ramsammy noted an estimated 34,000 diabetics in Guyana with the number growing at 8,900 per year.

<sup>3</sup> GSIP. July 2007. *Insulin Home-use Assessment*. Produced by Initiatives Inc. for the United States Agency for International Development.

<sup>4</sup> In Guyana, trenches are canals that run through residential, commercial, agricultural and industrial areas to channel water and prevent flooding. Children often swim or play in canals.

<sup>5</sup> The ADA, IDF and WHO recommend single use, but acknowledge the prevalence of and provide guidance for the re-use of insulin needles (see citations for a list of the documents in which the positions of the ADA, IDF and WHO appear). Since many insulin-using diabetics in Guyana depend on the government health system for insulin needles, GSIP's focus in this pilot was to test out full supply and assess its implications in terms of cost and logistics. If the Guyanese MOH is not capable of or chooses not to provide a full supply of insulin needles in the future, then clear guidelines for insulin needle reuse will need to be drafted and integrated into national treatment and counseling guidelines.

involvement of friends and family members in insulin injection and insulin needle disposal underscores the need for safety measures to prevent the possible spread of infection.

Finally, little information was available to clients about safe insulin needle use or disposal and few options were available for safe insulin needle disposal. Only 67% of patients reported ever receiving insulin-specific counseling and only 15% said they had ever been counseled on insulin needle disposal. There were no programs for safe insulin needle return to health facilities, forcing clients to come up with their own disposal solutions.

### **3.1 Pilot Purpose**

To address these issues, GSIP and the MOH conducted the Safer Insulin Needle Use and Disposal Pilot. The principal purpose of the pilot was to conduct operations research to help identify viable approaches to improving the safety of insulin needle use and disposal.

### **3.2 Pilot Objectives**

The objectives of the Safer Insulin Needle Use and Disposal Pilot were to:

1. Strengthen insulin needle use, storage and disposal counseling by:
  - Developing counseling protocols for insulin needle use, storage and disposal
  - Training providers and pharmacists at selected sites to counsel clients on insulin needle use, storage and disposal
2. Test out safe needle storage and disposal systems by:
  - Testing three options for home storage and transport of used needles to health facilities
  - Developing protocols for needle return to health facilities including: how needles should be returned, how often they should be returned, who should “handle” them at the facility and how they should be disposed of at the facility
  - Testing out disposal systems of “returned” needles at health facilities
3. Improve availability of insulin needles by:
  - Making adequate numbers (one needle per injection) of insulin needles available to clients each month
  - Understanding the supply and distribution implications of providing a full supply of insulin needles to patients
  - Testing out processes for documenting insulin needle requirements and distribution

## **4. Pilot Description**

### **4.1 Sample and Timeframe**

In Guyana, most diabetics who require insulin are referred to hospitals for care and follow-up. Hence, the pilot program focused on three government hospitals: New Amsterdam Hospital (NA), West Demerara Hospital (WDH) and Georgetown Public Hospital Corporation (GPHC). These hospitals were selected because they were easily reachable from Georgetown, enabling GSIP staff to conduct frequent monitoring visits, and they have large populations, so

solutions that work in these sites will be viable for a majority of diabetics using the government system. To address populations accessing services at private health facilities, GSIP included two GUYSUCO clinics in West Demerara region in the pilot.

GSIP, in conjunction with the Ministry of Health, conducted the Safer Insulin Needle Use and Disposal Pilot from January 15 through June 30, 2008. Training was provided to the GUYSUCO clinics and WDH staff in early January. GUYSUCO sites, which required no material inputs from GSIP initiated the pilot immediately following the training. WDH started in mid-March due to shipping delays of the BD Safe-Clip. GSIP trained GPHC and NA staff in February. GPHC started implementing the pilot on March 1. NA was the last to begin implementation due to unanticipated delays in the availability and shipping of the 2.5L safety boxes.

**Table 1: Diabetic Population Served at Sample Sites**

Site	Months Pilot in Operation	Average number of insulin-using diabetics seen per month
GPHC	4	209
NA	2	114
WDH	3	33
Guysuco: Uitvlugt	6	3
Guysuco: Wales	6	6

#### **4.2 Disposal Methods**

GSIP tested out four main methods of disposal:

1. 2.5 liter safety boxes designed for sharps disposal;
2. A safe clip that severs the needle after use;
3. Empty tablet containers sourced from hospital and clinic pharmacies; and
4. Client-sourced containers selected according to criteria presented by health facility staff to clients.

**Table 2: Disposal Methods Tested out at Sample Sites**

Site	Disposal method tested
GPHC	Empty tablet containers and client sourced containers <sup>6</sup>
NA	2.5 liter safety box
WDH	Needle clipper and empty tablet containers <sup>7</sup>
GUYSUCO: Uitvlugt	Empty tablet containers
GUSUCO: Wales	Empty tablet containers

As noted in Table 2 above, disposal methods were tested out by different sites so that results and experiences could be compared. Pictures of methods used are available in Appendix I.

*Safety box:* The 2.5 liter Disposafe™ safety box used in the pilot is produced by Medibest Group in Jakarta, Indonesia. It is approved by WHO and has guidance for assembly and safe disposal printed on the side. It also comes with a shoulder strap, which is handy for clients when transporting the box home or back to the hospital when full.

*Needle clipper:* The needle clipper GSIP tested out at West Demerara Hospital was the BD Safe-Clip™. The Safe-Clip™ is a small device, about 2.5 inches long and 1 inch wide, that holds up to 1,500 needles. Clipped needles are contained within the device, which is disposed of when full.

*Empty tablet containers:* At GPHC, Uitvlugt, Wales<sup>8</sup> and WDH, clinic nurses dispensed empty tablet containers to clients. The tablet containers were sourced from the facility pharmacy. GSIP staff visited the GPHC pharmacy and collected a week’s worth of empty tablet containers to assess which containers were regularly available and suitable for insulin syringe disposal. 400mg Acetaminophen, Ibuprofen and amoxicillin containers, which have a volume of one to one-and-a-half liters, were most commonly available and of suitable size. Before providing the containers to clients, nurses marked them with large red Xs so that they would be easily recognized as bio-waste when returned to the facility.

*Client-sourced containers:* Finally, to test out the safety and feasibility of client-sourced containers, clients at GPHC – when tablet containers ran short – were counseled on how to select their own disposal containers. Clients were advised to use a clean, empty plastic container with a

<sup>6</sup> In the original design, GPHC was to provide only used tablet containers to clients. However, changes in drug ordering altered the supply of empty tablet containers such that shortages were experienced for several weeks. To ensure that clients could still return their needles to the hospital for disposal guidance was provided on how to counsel clients to select appropriate disposal containers.

<sup>7</sup> The method tested out at WDH was influenced by staff interest and concerns. In the original pilot design, the Safe Clip was to be used alone and clipped syringes disposed of in regular garbage disposal sites. However, when the clip was tested out it was found to leave a very small fragment of the needle, enough to scratch but not to puncture skin. The diabetes clinic staff at West Demerara Hospital felt it would be better for the community if the clipped needles were returned to the hospital. A plan was put in place to instruct clients to place the clipped syringes in drink bottles and return them to the hospital diabetes clinic for disposal. Upon hearing that other sites were distributing empty tablet containers, however, the staff at WDH felt this to be a safer option and took it upon themselves to begin implementing the pilot with safe clips and distribution of empty tablet containers.

<sup>8</sup> In the original pilot design, Wales clinic was to advise clients to source their own containers. However, the staff did not feel fully confident that clients would choose safe containers and felt more comfortable providing empty tablet containers to clients and took it upon themselves to initiate this option.

secure cover such as a drink (Coke, Sprite), Ovaltine or Milo bottle. Clients were instructed to remove any labels from the bottles to reduce their attraction to children. They were also expressly told not to use metal containers as these cannot be disposed of in the facility sharps disposal system. A sample of drink bottles was collected and reviewed prior to initiating this option to ensure that none were PVC plastic and that they could not be easily punctured. In addition, GSIP regional consultants examined returns of client-sourced containers on a weekly basis to check for punctures, leaks or other safety hazards and to check if any returned containers were PVC plastic.

### **4.3 Container Distribution, Return and Disposal Systems**

Diabetic clients in Guyana have routine monthly visits with a physician. During these visits they collect a one-month supply of insulin and insulin needles. Clients were issued containers or instructed to source containers during routine diabetes clinic visits. They were advised to return their containers to the clinic at the next monthly visit or sooner if the container reached  $\frac{3}{4}$  capacity before the next clinic date. At all sites, clients were instructed to return the containers to the diabetes clinic nurse. The nurse placed the full, sealed, containers in a cardboard box in the diabetes clinic. At WDH, NA and GPHC, waste handlers collected the full containers at the end of every diabetes clinic day and disposed of them with other hospital sharps waste. The two GUYSUICO sites outsource their sharps waste disposal, so containers at these sites were kept secure in a cardboard box in one of the clinic rooms until pick-up day, usually once a week.

### **4.4 Insulin Needle Distribution**

The Safer Insulin Needle Use and Disposal Pilot also sought to reduce insulin needle re-use among diabetics. GSIP provided government pilot sites with enough syringes to supply each insulin user with a single syringe for each injection. GUYSUICO sites had enough syringes on site to provide a full supply on their own. To help track the distribution of syringes, GSIP developed a syringe and disposal container register which staff completed when supplying syringes and disposal containers.

At each site syringe and disposal container distribution was integrated into existing systems. At NA the central pharmacy took responsibility for the distribution of syringes, insulin, and disposal containers. Clinic nurses at NA collected full disposal containers because the pharmacy cannot take in biological waste. At GPHC, diabetes clinic nurses distributed syringes and disposal containers while the pharmacy distributed insulin. Clinic nurses also collected disposal containers. At WDH, the diabetes clinic pharmacy distributed syringes and insulin while the clinic nurses distributed disposal containers and collected full containers from clients. The GUYSUICO clinics were both very small, with one Medex playing multiple roles. At these sites, the medex distributed syringes, insulin and disposal containers and collected returned containers.

**Table 3: Syringe and Container Distribution**

Site	Distributes Syringes	Distributes Insulin	Distributes Disposal container	Collects returned containers
GPHC	Diabetes Clinic Nurses	Main Pharmacy	Diabetes Clinic Nurses	Diabetes Clinic Nurses
NA	Main Pharmacy	Main Pharmacy	Main Pharmacy	Diabetes Clinic Nurses
WDH	Diabetes Clinic Pharmacy	Diabetes Clinic Pharmacy	Diabetes Clinic Nurses	Diabetes Clinic Nurses
Guysuco: Uitvlugt	Medex	Medex	Medex	Medex
Guysuco: Wales	Medex	Medex	Medex	Medex

**4.5 Guidelines and Tools**

To guide the safe insulin needle use and disposal system, GSIP developed three key documents:

1. Safer Insulin Needle Use and Disposal Counseling Guidelines;
2. A training curriculum for nurses, pharmacists, waste handlers and physicians;
3. A register book format for recording distribution of insulin syringes and disposal containers as well as container return.

Descriptions of these tools are provided in the sections that follow. To help staff remember key messages when counseling clients and to help clients remember key messages at home, GSIP also developed a client information sheet. Staff used the sheet when counseling clients and then provided clients with the slip to take home, advising them to paste the sheet on the wall. Early on, a calendar was included on the information sheet to remind clients of their next clinic date. This was modified to a simple line for month and day in future versions. Finally, GSIP developed a similar job aid/client information slip to instruct clients on how to select their own disposal containers. This slip was used when the empty tablet container ran out at GPHC and WDH.

**4.6 Staff Training**

To ensure that staff had the knowledge and skill required to effectively implement the Safer Insulin Needle Use and Disposal Pilot, GSIP developed a training curriculum. The curriculum was framed around five key objectives:

1. To orient nurses, pharmacists, medex, and physicians on the safer insulin needle use and disposal pilot program and the specific methods to be implemented at their facility
2. To educate nurses, pharmacists, medex, and physicians about safer injection practices and their particular roles in implementing the safer insulin needle use and disposal pilot
3. To prepare nurses, pharmacists, medex and physicians to provide counseling to clients on safer insulin needle use and disposal methods
4. To prepare waste handlers to identify returned containers in clinics, pick up returned containers on a daily basis and dispose of the returned containers with other sharps and infectious waste per facility protocols

5. To build the competence of clinic and pharmacy staff to manage needle and disposal container supplies

The training comprised four modules: Module 1: Pilot Orientation and Overview of Safe Insulin Needle Use and Disposal, Module 2: Counseling for Safer Insulin Needle use and Disposal, Module 3: Supply Management and Record Keeping and Module 4: Waste Handler Orientation. These modules were designed to be as direct and time effective as possible, since staff at health facilities have little time for additional training activities. The four modules combined took five hours to implement and some participants were selected to attend only certain sessions. For examples, physicians attended only Module 1.

#### **4.7 Client Counseling**

To provide a resource for training and for clinical staff at health facilities, GSIP developed counseling guidelines for safer insulin needle use and disposal. The guidelines provided information on how to counsel clients to use and dispose of insulin needles more safely. Guidelines for safe syringe use were universal and applied to all sites. Guidelines for disposal were divided so that specific guidance could be provided for each method of disposal being tested out. Finally, the guidelines provided information to nurses and pharmacists on how to counsel clients returning for follow-up visits to ensure that they had understood safe needle use and disposal messages and that they were practicing safe insulin needle use and disposal.

GSIP also developed several counseling job aids. Examples included a client information sheet, which nurses used to guide them to give information to the client before providing the client with the sheet to take home and a counseling sheet for client sourced containers. The client information sheets were tailored to each site so that specifics on proper use of disposal methods could be documented.

#### **4.8 Integration**

As noted previously, the focus of the pilot was to integrate counseling and needle and container distribution into existing systems. This was possible in most sites where diabetes clinics have designated days and nursing staff have clear responsibilities for providing patient care. However, implementing the pilot at GPHC presented several challenges. The nursing staff designated on clinic days at GPHC usually consists of only one nurse who records patients in a register book and gives them a few insulin needles. The insulin pilot required client counseling, better record keeping, and the distribution of the empty tablet containers and a full supply of insulin needles, which the nurse felt she did not have the time to take on. To address this problem, GPHC management appointed a second nurse whose sole responsibility was to counsel clients, keep the insulin needles and container disposal register, distribute needles and disposal containers to clients and collect disposal containers returned by clients. Overall, this system worked well, but problems were encountered when the designated staff member could not come to work on a clinic day and the system, while relatively effective, raises questions about the sustainability of the program at GPHC. Can GPHC make staff available to continue the process?

NA presented other challenges. At NA, clients go first to medical records where they pick up their medical file. Then they either go to the clinic and see the nurse or to the physician. If clients go directly to the physician, they often by-pass the nurses entirely, so opportunities for counseling are missed. In addition, some clients return for re-supply without actually visiting the

clinic. To address these issues, counseling was provided in three locations: the medical records department, where one nurse was on hand, the diabetes clinic and the pharmacy. When clients presented at medical records, medical records staff checked to see if they were insulin users. If so, they were told to speak with the nurse in the medical records department. The nurse provided the client with key counseling messages and with a flyer informing them of the key safe needle use and disposal messages. She then instructed them to see the clinic nurse or physician and then pick up their needles and disposal containers from the pharmacy. Messages were reinforced by the clinic nurses for clients who visited the clinic. Clients who did not visit the clinic were at least provided safe disposal messages by the pharmacist when picking up insulin, syringes and disposal containers. While the system worked, it was complicated and it was clear that several clients fell through the cracks. If the nurse stepped out of the medical records department, clients did not receive counseling.

#### **4.9 Pilot Monitoring**

GSIP monitored the Pilot on a monthly basis and provided bi-weekly supervision visits to the sites. Monitoring included a review of numbers of clients, syringes distributed, containers distributed, and injections per day per client recorded in insulin needle and disposal container distribution registers and an assessment of insulin needle and disposal container stocks. GSIP also engaged two of its regional consultants<sup>9</sup> to conduct the supervision visits and to carry out regular client home visits to assess client satisfaction with the disposal system and observe how clients keep their disposal containers and syringes in the home. The aim of conducting client home-visits throughout the course of the pilot was to identify any behaviors or issues that might put clients at risk and to be able to address them during the pilot if possible. Issues identified included clients recapping or bending needles before disposal, a behavior that was a matter of habit for many. This issue was brought to the attention of counselors who placed emphasis on messages not to recap or bend needles in their counseling sessions. No complications with disposal methods were identified and, in general, clients expressed appreciation for the home visits.

## **5. Evaluation Design**

### **5.1 Sample**

The Safer Insulin Needle Use and Disposal Pilot evaluation included all pilot sites. The evaluation team made an effort interview all nurses, pharmacists and waste handlers who participated in the pilot. Client visits were arranged based on the identification of clients who agreed to be visited at home. An effort was made to sample 30% of clients visiting sample sites. Table 4 gives details on numbers of interviews and observations conducted.

### **5.2 Methods**

Five data collection tools were used. These included the client home visit questionnaire, nurse and pharmacist interview form, waste handler interview form, record book database and client-sourced container observation form. The pilot team sought to visit approximately thirty-

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<sup>9</sup> GSIP employs regional consultants to provide supervision and monitoring support to its programs. The consultants are usually individuals with clinical qualifications and familiarity with the health facilities in the region where they provide support. The regional consultants for region four and six, both nurses, were further engaged to assist in supervision and data collection for this pilot program.

percent of clients from each facility. However, clients from GPHC and the GUYSUCO sites proved to be difficult to connect with since, in the case of GPHC, many did not live in Georgetown itself or were available during the week and, in the case of GUYSUCO, clients often lived in remote or hard to reach areas. To accommodate the schedules of GPHC clients, GSIP staff and regional consultants conducted some client home visits on Saturdays. Despite their efforts, they were unable to obtain a thirty-percent sample for GPHC.

**Table 4: Interviews, Observations and Record Reviews**

Instrument	GPHC	NA	WDH	GUYSUCO	Total Number
Client Home Visit Questionnaire	29	32	12	3 <sup>10</sup>	77
Nurse and Pharmacist Interview: Nurses	4	2	2	4 <sup>11</sup>	12 <sup>12</sup>
Nurse and Pharmacist Interview: Pharm.	1	3	2	---	6 <sup>13</sup>
Waste Handler Interview	2	3	3	---- <sup>14</sup>	7
Record Book Database	1	1	1	2	5
Client-sourced Container Observation	10	0	3	0	13

### 5.3 Ethical Considerations

Information on storage and use of insulin needles and disposal containers at home was an essential element of the pilot program. GSIP was careful to ensure that clients understood the purpose of and voluntarily agreed to home visits. Client consent for home-visits was obtained and confirmed in a three stage process. First clients were asked by nurses if they would be willing to have a GSIP representative visit them at home. If the client agreed he or she provided a contact number and signed consent for the provision of the number. The GSIP regional consultants contacted the client to re-explain the purpose of the home-visit, confirm client consent to be visited at home and set up a time for the home visit. Finally, at the beginning of home visits, the GSIP regional consultant or staff member explained once again the purpose of the visit and asked the client if he or she consented to the visit before the home visit interview and observation could take place. Verbal consent was accepted and noted on data collection forms. If a client declined to consent at any stage in this process or seemed visibly uncomfortable, the interview would be stopped and a new client sought out.

### 5.4 Data Collection

A team of three data collectors, including one GSIP staff member and two GSIP regional consultants, collected data throughout the course of the pilot process and immediately following the pilot conclusion. As previously noted, client home visits, which included interview questions and observations, were an integral part of the piloting process. Two additional questionnaires, one for nurses and pharmacists and the other for waste handlers, were administered after the completion of the pilot program to gather information on staff satisfaction with the system, workload requirements and safety issues.

### 5.5 Data Entry and Analysis

<sup>10</sup> Clients proved hard to reach as many lived very far from the clinics.

<sup>11</sup> Nurses and Medex act also carryout pharmacy responsibilities at these sites.

<sup>12</sup> Includes 9 nurses, one nurses aide, and two MEDEX

<sup>13</sup> Includes 5 pharmacists, one pharmacy technician and one statistical clerk

<sup>14</sup> Disposal of waste is outsourced to a private company.

Data from interviews and client home-visits were coded and entered into MS Access databases. Data were then exported to MS Excel for analysis. Data from observations of client sourced containers and from insulin needle and disposal container registers were entered directly into MS Excel spreadsheets, where the data were also analyzed. Data were analyzed for total numbers as in clients seen, supplies distributed or returned, or visits made; frequency of responses to interview questions, and mean responses for interview questions that asked interviewees to rate, for example, usability of disposal methods.

## 6. Findings

### 6.1 Insulin User Characteristics

Insulin needle use and disposal requirements vary depending on the number of injections a client takes per day. Data from the pilot presented in Table 3 suggest a range in prescription practices and attendant syringe requirements.

**Table 5: Insulin Needle Distribution and Insulin Use**

Site	Months Pilot in Operation	Total Client visits attended	Monthly average client visits attended	Syringes Distributed	Monthly Average Syringes Distributed	Average number of syringes distributed per client per month	% of clients on more than one dose of insulin per day
GPHC	4	836	209	38,929	9732	47	43%
NA	2	227	114	12,630	6315	55	82%
WDH	3	99	33	4,687	1562	47	68%
GUYSUCO I	6	41	6	1,148	191	32	0%
GUYSUCO W	6	18	3	686	114	38	67%
<b>TOTAL</b>		<b>1221</b>		<b>58,080</b>		<b>44</b>	

Reasons for variations in insulin use are not clear. The relatively high percentage of insulin using diabetics at NA could be due to differences in physician prescription practices, or it could be due to differences in client demographics, culture and behavior. It simply is not clear from the data available. What is clear is the higher the percentage of clients on more than one dose of insulin per day, the greater the need for insulin needles, and this has cost implications for the government. The data suggest that an assessment of prescription practices at GPHC, NA and WDH would be worthwhile so that the government can ensure that prescription standards are being adhered to. In addition, MOH may want to consider adopting the insulin needle use and disposal register used in the pilot as it will enable them to collect and monitor data in insulin users on a regular basis.

It is also important to note that in the short span of the pilot, as many as 58,080 used insulin syringes were kept out of communities. While the data suggest that not all clients returned containers to the facility (Table 6), it is assumed that most will when the containers are full. Client interviews suggest that clients overwhelmingly feel that the disposal containers and return to the facility are safer than disposal in their regular household garbage.

## 6.2 Container Return

Return of containers to health facilities was, in general, better than expected. However, return to GPHC was significantly poorer than other sites. Out of a total of 904 disposal containers, 742 should have been returned at the time of the GSIP data collection, but 348 remained unaccounted for. Staff at GPHC noted that some clients forgot to bring their containers. GSIP observed some clients on clinic days without their containers. These clients either said they forgot their containers or that the containers were not full and they were waiting until they were full to return them. GSIP identified this problem early on and provided additional orientation to staff on how to counsel clients. Return of containers improved at GPHC over the course of the pilot, but further investigation is needed to fully understand the issues.

**Table 6: Safety Boxes Distributed and Returned**

Site	Months Pilot in Operation	Total Disposal Containers Distributed	Monthly average client visits attended	Number of Clients Instructed to Source Own Container	Containers Returned	Containers Expected (minus month of June)	Containers unaccounted for
GPHC	4	904	226	38	394	742	348
NA	2	231	116	0	129	153	24
WDH	3	82	27	8	91	58	-33 <sup>15</sup>
GUYSUCO I	6	25	4	0	25	25	0
GUYSUCO W	6	22	4	0	21	22	1
<b>TOTAL</b>		<b>1264</b>		<b>46</b>	<b>660</b>	<b>1000</b>	<b>340</b>

## 6.3 Counseling

The evaluation results suggest that counseling was provided by nurses and pharmacists and that it was effective. 95% of the seventy-five clients interviewed said they received counseling on safe needle use and disposal. 97% said the nurse or pharmacist explained to them how to use the disposal container. 100% of the seventy-two who received counseling said the pharmacists explained why they were being given the specified number of needles. All (100%) also reported receiving messages on needle disposal. Key messages repeated by clients in response to an open ended question included: Put used needle in disposal container immediately after use, 81%; return the container to the clinic, 25%; and fill only to the ¾ mark, 18%.

71% of clients reported receiving a safe insulin needle use and disposal information slip from the clinic nurse. Perhaps more importantly, all clients (100%) were able to list two key messages. When asked, in an open ended question, what safe needle use messages they remembered, 42% of clients noted the “one needle one injection” message, 14% cited “no recapping before disposal,” and 14% cited immediate disposal into the disposal container. When asked what safe disposal messages they remembered, 81% of clients noted immediate disposal into the disposal container after use, 25% noted return of the disposal container to the clinic, and 18% noted that the container should not be filled beyond the ¾ mark.

<sup>15</sup> WDH experienced some problems with record keeping. Early on, nurses did not record distribution of empty tablet containers. By the second month, when clients began returning containers, the problem had been identified and addressed. This may account for the discrepancy in the number received versus distributed.

#### **6.4 Disposal Container Safety**

All disposal containers tested were assessed to be safe. GSIP staff and regional consultants observed seventy-seven disposal containers in client homes. Of these, 94% were kept in places safe from child tampering and 96% were sufficiently isolated from other household objects. Only six containers (8%) were observed to be more than  $\frac{3}{4}$  full and none (0%) were observed to have punctures, to be leaking fluid, or to be emitting offensive odors.

Of the fifty-eight clients interviewed who had returned containers to the clinic, none (0%) reported injury while returning the container. Only one client (2%) reported having any problem, but did not specify what the problem was.

Facilities also experienced little trouble with the return program. All (100%) of the seven waste handlers interviewed said they feel safe disposing of the client returned containers. This applied to all methods, including client sourced bottles. None of the waste handlers interviewed reported any injury or problem while handling the client returned containers. All the waste handlers interviewed said they were satisfied with the insulin needle disposal system.

Waste handlers report collecting disposal containers on each clinic day (29%) or once a week (71%)<sup>16</sup>. Six (86%) of the seven waste handlers interviewed said that disposing of client returned containers did not increase or only increased a little their workload. Waste handlers felt they could safely identify the containers with sharps because nurses had marked them with a red “X” or sometimes the word “SHARPS.” This added indication was appreciated by waste handlers.

Thirteen client sourced containers were observed by GSIP after client return. Most of these containers were empty drink bottles with the label removed. The bottles were examined for punctures, leaks or other safety hazards. GSIP found that all the containers were securely sealed; none had punctures, leaks or liquid inside; and none were PVC plastic.

#### **6.5 Provider Satisfaction**

The organization of insulin syringes and disposal containers and counseling and disposal of client returned containers, all added to the responsibilities and time required by nurses, pharmacists and waste handlers to care for clients and ensure a safe environment at the facility. Despite the added work burden, all (100%) of the twenty-five nurses, pharmacists and waste handlers interviewed felt the program should continue.

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<sup>16</sup> GPHC’s diabetes clinic is only one day a week, Wednesdays, so waste handlers might have answered either clinic day or weekly and been indicating the same response.

**Table 7: Provider Workload Assessment**

How much has ... increased your workload?					The increase is acceptable
Site	Not at all	A little	Some	A lot	
Counseling (N = 16)	33%	44%	17%	28%	89%
Record Keeping (N = 18)	11%	44%	11%	33%	73%
Distribution of Containers (N = 16)	44%	22%	22%	11%	50%
Distribution of Syringes (N= 18)	55%	22%	11%	11%	50%
Disposal of Containers (N = 5)	43%	43%	0%	14%	100%

Staff noted, however, that some tasks were a greater burden than others. Distribution of insulin syringes and disposal containers posed the greatest strain on staff time and 50% of staff interviewed said the added workload imposed by these activities was not acceptable. Interestingly, most of the personnel who responded felt that the increased workload created by distribution was not great, less than counseling and record keeping. This suggests that the staff may not view the distribution as important or as part of their responsibility. Distribution was particularly difficult at GPHC, which did not have enough nurses in the diabetes clinic to distribute supplies or counsel clients. Although the Hospital administration appointed a staff member to take on this role for the pilot, hospitals may need to consider appointing an additional staff member (perhaps a trained assistant or auxiliary staff member) to assist with syringe and disposal container distribution on clinic days, especially during peak hours between 9 in the morning and 12 in the afternoon.

### 6.6 Client Satisfaction

Across the board, clients were highly satisfied with the insulin-needle disposal systems, including containers and return procedures. 10% of clients attending New Amsterdam Hospital, where the 2.5L safety-box was distributed, rated the system as merely good. However, none had complaints and most said they felt safer using the safety box. The Disposafe™ safety-box also rated slightly higher at 4.3 out of five than the empty tablet container, which was rated at 4.2. No clients rated the disposal system as less than good at any site. As Table 8 shows, there was very little difference in the assessment of disposal methods. Client sourced containers got an average rating of 4.5, but only two clients who used this method were interviewed.

**Table 8: Client Assessments of Disposal Method Usability**

Site	Clients Interviewed	Excellent	V. Good	Good	Fair	Poor	Average Rating out of 5
2.5L Safety Box	31	39%	52%	10%	0%	0%	4.3
Tablet Container	39	18%	79%	3%	0%	0%	4.2
Safe-Clip™	4	25%	75%	0%	0%	0%	4.3
Client Sourced Container	2	50%	50%	0%	0%	0%	4.5

Of the fifty-seven clients interviewed who had returned a container to the clinic, none (0%) reported experiencing problems either in transport or with the staff or process at the facility.

Clients also appreciated receiving a syringe for each injection. All (100%) of the 75 clients interviewed who responded to the question about whether they liked receiving a syringe for every injection said they did. 51% of clients said they liked having a needle for each injection because it was less painful or caused less bruising. Others said they felt better protected from infection.

### **6.7 Needle Use and Community Risk Reduction**

It is clear that the availability of insulin needles is the single greatest factor in insulin needle re-use. Only six (8%) clients interviewed during the course of the pilot and immediately following the conclusion of the pilot program said they had re-used an insulin needle in the last month. This is a significant decline from the pre-pilot Insulin Home-use Assessment which found that 82% of clients re-used insulin needles. Furthermore, four of six clients who said they re-used were interviewed at the start of the pilot and explained that they had not been given enough needles by the clinic the previous month (prior to the start of the pilot). Only two of the 75 clients interviewed stated re-using an insulin needle during the course of the pilot program. Both clients stated insufficient supply, although the reason for the short supply was not made clear.

Although few data on the risks of insulin needle re-use are available, single use is recommended by the ADA, IDF and WHO (see citations) in order to reduce any chances of infection or scarring that may inhibit insulin absorption. In the case of Guyana, where diabetics often receive assistance injecting insulin and disposing of used syringes, single-use may also provide added protection to friends and family members who perform these tasks.<sup>17</sup>

However, single-use of insulin needles also increases the number of needles required by insulin-using diabetics and, therefore, increases the volume of sharps waste. Any single-use program must be accompanied by an effective safe disposal program in order to keep community exposure to used needles at a minimum.

### **6.8 Cost**

#### *Cost: Disposal Containers*

Cost is a major factor in assessing the sustainability of methods for improving the safety of insulin needle use and disposal. GSIP consciously identified a variety of methods to compare safety, use-ability and cost. Data on client satisfaction show no substantial difference in client's views of the various disposal methods. Likewise, providers are equally comfortable and satisfied with the Safe-Clip™, empty tablet containers and safety boxes. Providers who worked with client returned bottles also felt comfortable with the containers received. However, at the start of the pilot providers at WHD and Wales clinic, which were supposed to test out client-

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<sup>17</sup> Many diabetics have poor eyesight or feel nervous about injecting themselves. Others prefer taking their injections in their arm and have difficulty doing this comfortably one-handed. For these reasons, many diabetics prefer to have a friend or family member help them inject.

sourced containers, stated that they did not feel wholly comfortable with allowing clients to source their own disposal devices and preferred to provide them with empty tablet containers instead. The major advantages of the client-sourced containers are that they cost the Ministry of Health nothing, and they save the time of collecting, organizing and distributing empty tablet containers at the facility. Unfortunately, not enough data were collected during the course of the pilot to assert that client-sourced containers are safe, although they appear to be.

**Table 9: Disposal Method Cost (USD)**

Method	Per Unit <sup>18</sup>	Units required per client per year	Estimated annual cost per client per year <sup>19</sup>	Total estimated Annual cost to MOH <sup>20</sup>
Empty Tablet Container	\$0	12	\$0	\$0
2.5L Disposafe™ Safety Box	\$.79	12	\$9.48	\$171,872 <sup>21</sup>
BD Safe-Clip™	\$4.5	.33	\$1.45	\$26,289
Client-sourced container	\$0	12	\$0	\$0

It is clear from Table 9 above that while the Disposafe™ safety box is well designed, meets international standards and is appreciated by clients, its cost is far greater than the other options. Depending on the Ministry's budget, the cost may compromise its feasibility and sustainability. The BD Safe-Clip™ is a less costly and more sustainable option, but is preferably used with another disposal option, such as an empty tablet container or drink bottle,<sup>22</sup> which brings its necessity into question. The use of empty tablet containers, which essentially recycles pharmacy waste, is a well received, safe and cost effective option for containing and disposing used insulin needles. However, the pilot showed that supplies of empty containers can run short.

Empty tablet containers emerge as the preferred and most cost effective option, but the issue of shortages needs to be addressed. There are two main options for addressing this problem. First, clients can be instructed to return containers when full, rather than at the end of the month regardless of how full the container is. Clients who inject only one time per day, may be able to return containers every other month, depending on its size, thereby decreasing container demand. Second, facilities can distribute empty tablet containers but use client sourced containers as back-up option, as was done at GPHC and WDH during the insulin pilot. For this to be safe and effective, the MOH would have to adopt the client-sourced container

<sup>18</sup> Does not include shipping costs

<sup>19</sup> Assuming an average of 44 syringes/client per month (see Table 3)

<sup>20</sup> Guyana does not have surveillance data on diabetes. Therefore, this estimate is based on the assumption that there were 34,000 diabetics in Guyana in 2006 (Ramsammy 2006) and that the number of diabetics grew at a rate of 1,158 new cases per year per 100,000 population (totaling roughly 8,900/year) (ibid) or 51,800 diabetics in 2008. It also assumes that 35% (18,130) of diabetics are insulin users. This number is taken from GPHC, which fell between the low rate of 22% at WDH and the high rate of 48% at NAH assessed in the Insulin Home-use Assessment conducted by GSIP in 2007.

<sup>21</sup> The safety-boxes hold up to 65 syringes. Therefore, clients requiring only one injection per day could keep the box two months and then return it to the clinic. This could reduce costs by 18% (to \$140,820) if fifty percent of insulin using diabetics inject only one time a day. At NAH, where the safety box was tested out, 82% of clients inject more than once per day, so bi-monthly return was not recommended.

<sup>22</sup> Any risk of needle puncture or re-use, and therefore major risks of disease transmission, is eliminated by the Safe-Clip™, but community members could still be exposed to scrapes and other injuries.

guidelines and continue programs to counsel clients on how to select and handle their own containers.

*Cost: Insulin Needles*

To try and improve the safety of insulin injection, GSIP provided clients at pilot sites with a full monthly supply of insulin needles (one needle per injection). Clients overwhelmingly preferred using one syringe per injection as it decreased the pain and scarring that often accompanies re-use. They also stated that they felt safer – better protected from infection – using syringes only once. While the provision of a full supply of syringes to clients is the safest option, it comes with associated costs.

Table 10 shows the estimated cost differences between what the MOH would spend to provide all diabetic insulin users in Guyana a full supply of syringes given the type of syringe the MOH has been purchasing and assuming an average distribution of fifteen syringes per client per month and the provision of a full supply of syringes using the HMD syringes ordered by GSIP. It illustrates that the added cost of providing a full supply of insulin syringes to all diabetic clients come to \$193,991. However, not all insulin using diabetics currently seek services at government facilities and the actual current costs and added costs are likely to be lower.

**Table 10: Estimate of Insulin Syringe Costs for All Insulin Users in Guyana (USD)<sup>23</sup>**

Syringes	Used by	Syringe	Cost per Unit <sup>24</sup>	Average Cost per Client per year <sup>25</sup>	Total estimated Annual cost to MOH <sup>26</sup>
15/client/month	MOH Current	MedicTenedic	.055	\$9.90	\$179,487
44/client/month	GSIP Pilot	HMD <sup>27</sup>	.039	\$20.60	\$373,478
44/client/month	MOH	MedicTenedic	.055	\$29.04	\$526,495
44/client/month	None (Comp. Only)	BD	.068	\$35.90	\$650,867
<b>Estimated Additional Annual Cost to MOH of Full Insulin Syringe Supply</b>					<b>\$193,991</b>

Table 11 outlines the estimated current costs of insulin syringe provision for each of the pilot sites using the current syringes provided by MOH and GPHC and compares this cost to the projected cost of providing a full supply of less costly<sup>28</sup> insulin syringes to each client. It shows

<sup>23</sup> This estimate was calculated in the absence of data on the number of clients who seek services at government health facilities. Not all insulin users seek services or supplies at government facilities. MOH does not provide supplies to GPHC, which services a large number of diabetic clients. As a result, the actual current costs and actual added costs are likely to be lower than what is represented here.

<sup>24</sup> Assumes purchase of 100,000 syringes

<sup>25</sup> Assumes an average of 44 syringes per client per month (see Table 3).

<sup>26</sup> Guyana does not have surveillance data on diabetes. Therefore, this estimate is based on the assumption that there were 34,000 diabetics in Guyana in 2006 (Ramsammy 2006) and that the number of diabetics grew at a rate of 1,158 new cases per year per 100,000 population (totaling roughly 8,900/year) (ibid) or 51,800 diabetics in 2008. It also assumes that 35% (18,130) of diabetics are insulin users. This number is taken from GPHC, which fell between the low rate of 22% at WDH and the high rate of 48% at NAH assessed in the Insulin Home-use Assessment conducted by GSIP in 2007.

<sup>27</sup> Hindustan Syringes and Medical Devices Limited

<sup>28</sup> Please note, GSIP does not endorse any particular brand of syringe. HMD syringes are listed here because they are less costly than MedicTenedic syringes currently purchased by MOH and GPHC and clients say the syringes currently available are very painful. Clients had no complaints about the HMD syringes used by GSIP and said they

that at most sites, the added cost of providing a full supply of insulin syringes would not be substantial. At the GUYSUCO sites, the added cost is only \$23 and \$31 respectively. At GPHC the cost difference is only \$835 per annum. The only site that would have a substantial increase in costs is New Amsterdam Hospital. Its higher costs are largely tied to the greater number of clients it has on two or more injections per day, stressing the need for further investigation into prescription practices at NA.

**Table 11: Estimate of Insulin Syringe Costs per Site (USD)<sup>29</sup>**

Site	Current Distribution and Syringe Costs			Full Distribution with HMD Syringe		Added Annual Cost Per Site of Full Supply with HMD Syringe
	Current Average Monthly Syringe Distribution/client	Average Number of Clients Per Month	Total Estimated Annual Cost per Site	Average Monthly Syringe Requirement/Client	Total Estimated Annual Cost per Site	
GPHC	15	209	\$3,762	47	\$4,597	\$835
NA	15	114	\$1,129	55	\$2,934	\$1,805
WDH	15	33	\$327	47	\$726	\$399
GUYSUCO I	15	6	\$59	32	\$90	\$31
GUYSUCO W	15	3	\$30	38	\$53	\$23

As an unintended consequence of this initiative, GSIP found that clients did not like the MedicTenedic syringes being offered at the hospitals previously. They complained that they were painful and noted that they preferred the HMD syringes being offered by the hospital for the Pilot. In doing a cost comparison, GSIP found that the standard unit cost for MedicTenedic syringes in the MOH stock was higher than the HMD syringes. MOH should look into replacing the MedicTenedic syringes with another brand.

### **6.9 Record Keeping**

The insulin needle and disposal container distribution and return registers implemented during the pilot recorded important information that helped GSIP monitor the pilot program. Most hospitals in Guyana keep an insulin distribution register, but no information on insulin syringe stocks and distribution or disposal containers is typically kept. For the purpose of the pilot, a separate register book was developed. MOH should integrate insulin needle distribution information into the insulin register or into the diabetes clinic book (depending on from where the syringes are distributed). If the MOH chooses to adopt a facility-based insulin syringe system, then the data collected on disposal container distribution and return should also be integrated into existing registers.

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did not cause pain; however, any brand of syringe for which MOH is willing to pay and with which clients are satisfied would be acceptable.

<sup>29</sup> This estimate was calculated in the absence of data on the number of clients who seek services at government health facilities. Not all insulin users seek services or supplies at government facilities. MOH does not provide supplies to GPHC, which services a large number of diabetic clients. As a result, the actual current costs and actual added costs are likely to be lower than what is represented here.

## 7. Conclusions

The Safer Insulin Needle Use and Disposal Pilot was well received and appreciated by staff and clients. Facility return of used insulin needles is feasible in a cost effective manner and should be made available to all clients. Register formats for collecting data on insulin syringe distribution, disposal container distribution and disposal container return should be adopted or integrated with the existing clinic and insulin registers. Clearly documenting distribution and return as well as other information such as number of injections per day, will enable MOH to better monitor diabetes services. While all methods tested were appreciated by clients and staff members and were found to be equally safe (more data on client-sourced containers required), empty tablet containers were the most cost effective and were also liked by staff. Providing clients with a single syringe for each injection reduced insulin needle re-use and may reduce risks of disease transmission to friends and family members who assist diabetics with insulin injections. Finally, staff and clients would like to see this program continue. If the program is adopted by MOH, some hospitals will need to consider appointing a staff member to assist with insulin needle and disposal container distribution. Systems for training staff to counsel clients will also need to be rolled out and, eventually, integrated into pre-service training curricula.

## 8. Citations

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## APPENDIX 1: Disposal Method Images

### 1. 2.5 Liter Safety Box



### 3. Empty Tablet Container from Facility Pharmacy



### 2. BD Safe-Clip™



### 4. Client Sourced Container

