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Worker Safety, Cost Savings and Plastic Waste Management

Clinical Trial Results

PENANG GENERAL HOSPITAL

DEPARTMENT: WARD C5

1/9/2018



Hospital Kuala Lumpur

Worker Safety, Cost Savings and Plastic Waste Management

Clinical Trial Report

Needle Removal

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SHARPS TERMINATOR®



SharpsAid, Inc. 148 S. Bloomingdale Road #105 Bloomingdale, Illinois 60108

Email: sharpsaid@gmail.com www.sharpsterminatorasia.com Phone: 800-284-3096

SHARPS TERMINATOR 10-DAY PENANG GH STUDY

Evaluation Period: 10 DAYS JANUARY 2018

Start date: 28 / 02 /2018 Completion date: 09 / 03 /2018

Hospital/Clinic: Hospital Pulau Pinang

Ward: C5

Study Coordinator: Patrick Reagan, Dato Ir. Kazal Sinha

MOH HOSPITAL STAFF

1. **Dato' Dr. Norsidah bt Ismail-Director of Penang Hospital**
2. **Or. Shameni a/p Sunasundram -Deputy Director of Penang Hospital**
3. **Dr. Nur Asyura bt Muhammad -Deputy Director of Penang Hospital**
4. **Malathi a/p Govindasamy -Matron**
5. **Thanaletchimi a/p Packirisamy -Matron**
6. **Suhila bt Jailani -Sister**
7. **Che Azaini Suyana bt Hassan -Sister**
8. **Dr. Chow Ting Soo – Infectious Disease**
9. **Dr, Ong Kouk Yong – Infectious Control Medical Officer**
10. **Dr. Goh Hin Kwang – Director Clinical Operations**
11. **Mr. Surentharan Mathavan – Chief Assistant Director**

Five Terminator units to be utilized on each of the five existing treatment carts in C5.

DATA TO BE COLLECTED/PRELIMINARY DATA:

- # of Sharps Bins used Current: 2.5L= **30** ; 5L= **50** ; 10L= **50** ; 20L= **10**
- # of Sharps Bins Used Study: 2.5L= **5** ; 5L= **1** ; 10L= **2** ; 20L= **1**
- Bin Collection Current: **40** times 10 Day Period.
- Bin Collection: **1** times 10 Day Period.
- # of Poly Bags Used Current: 5L= **50** ; 30L= **50** ; 100L= **5** ****per day**
- # of Poly Bags Used Study: 5L= No Change in Poly Bag Usage.
- Needle Stick Incidents: Ward C5: 3 incidents ytd UEM: 3 incidents 2016
- # of Shifts before Re-Charge/Clean Unit: 1
- Bin Reductions = _____



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- Device performed as expected:
 - Syringes used: 18g-29g - 3 cc, 5 cc, 10 cc, 20 ccc & 50 cc
-

One-hour training and orientation will be needed for HCW staff users and thirty minutes training for the maintenance personnel for proper cleaning and charging procedures.

Abstract

Background: Disposable puncture proof sharps containers for the safe disposal of sharps is one of the engineering controls and is an integral component of the clinical waste management system and a healthcare facility's sharps injury prevention program. Notwithstanding, the necessity for the use of such containers, it is nevertheless a significant cost to the concessionaire's.

Information obtained in 2016 shows that an estimated 222,400 sharps containers were purchased by UEM. The four sizes and costs of bins in use are: 2.5L \$4.47; 5L \$5.54; 10L \$9.06 and 20L \$15.97.

In 2015 a clinical trial was conducted at Hospital Kuala Lumpur. This study was coordinated with the Occupational Health Unit- Malaysian Ministry of Health. Wards 18A and 24 participated.

The purpose of the 2015 HKL- 18A, 24 study was to determine if an innovative safety device, the Sharps Terminator would reduce or eliminate needle-stick incidents at the point of procedure. Additionally, by removing the needle metal portion of the syringe, how much increased volume would be added to the sharps containers.

Upon reviewing the data collected from the 2015 HKL clinical trial, it was concluded that by removing the needle from the syringe a 50% increase in Sharp Bin volume was achieved. Therefore, reducing the number of bins utilized.

Designation: The Sharps Terminator is a portable safety device that can incinerate a needle at the point of procedure in three seconds. After incineration, the Sharps Terminator automatically cuts the hub of the syringe separating it from the syringe barrel and plunger. (see figure 1 below)

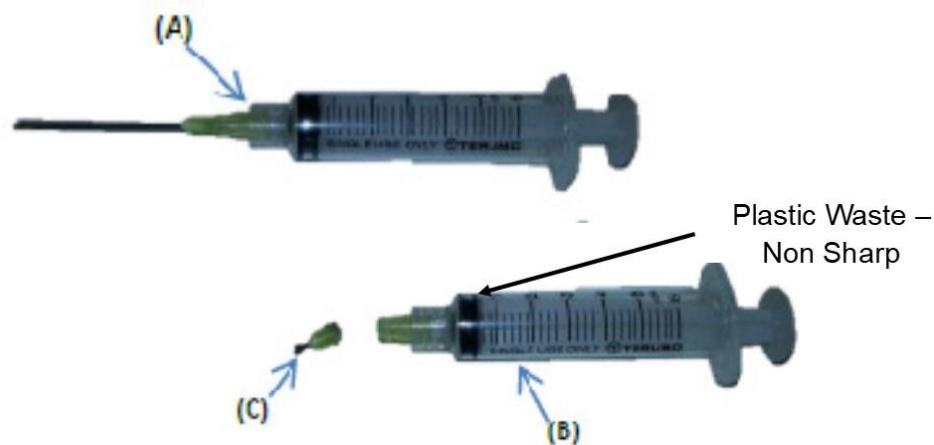


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Before processing: A – hypodermic needle
After processing two main categories of remain are left:
B – Needle hub C -- Example of Swarf

Figure 1

Purpose of Study

The purpose of this 10-Day study is to verify our proposed amount of savings to the concessionaire by reducing the number of Sharps Bin necessary for safe operation.

Our proposal to UEM dated 21/09/2017 is based on an estimated 80% reduction in Sharps Bin procurement.

As previously illustrated in figure 1, the plastic syringe, plunger and cap are no longer a sharps hazard. There is no longer a reason to place this waste in puncture proof sharps bin.

Procedural Change

The HealthCare Worker (HCW) will incinerate the needle using the Sharps Terminator device. This will be done at the point of procedure. The needle-less syringe barrel and cap will be placed into a yellow Bio-Hazard Poly Bag.

After 30 procedures the contents of the Sharps Terminator swarf tube will be emptied into the designated sharps container. (see figure 2 below)

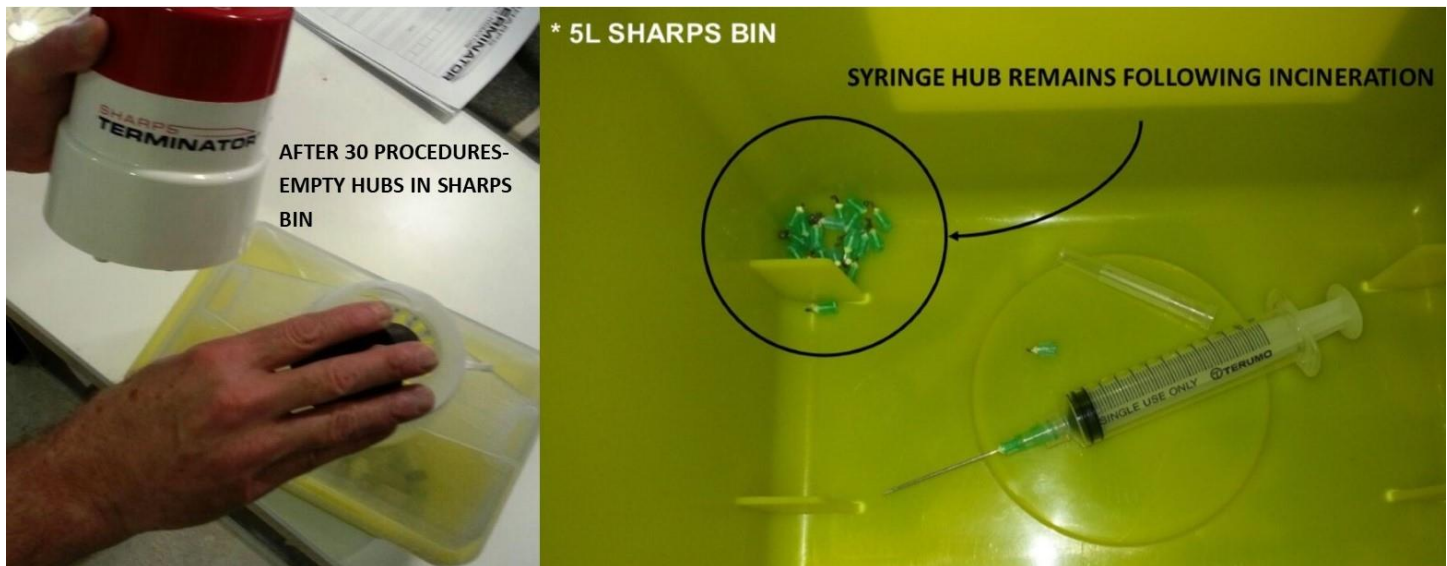


Figure 2

Primary Objective

The primary objective of this study is to determine how many less Sharps Bins will be used and then calculate the amount of savings that is available to the concessionaires'.

Data Collection: (gathering and measuring information)

1. Setting of baseline on the raw data to be collected before start of study.

The baseline data for the number of bins currently used in C5 was collected from current records and provided by UEM staff at the location.

of Sharps Bins used Current: 2.5L= 3 ; 5L= 5 ; 10L= 5 ; 20L= 1 **per day

The size of the Sharps Bins in use in ward C5 are 2.5L, 5L, 10L and 20L.

Currently, UEM waste collection personnel collect waste from ward C5 four times daily.

During the 10-day study period, the UEM waste collection personnel will be instructed to only collect the Sharps Bins that are full. At the end of each day, the number of Sharps Bins will be logged and provided to Study Coordinator: Patrick Reagan. The daily Bin usage will be logged into the Daily Bin Usage Table and verified by UEM Edgenta Director- Mr. Jega.



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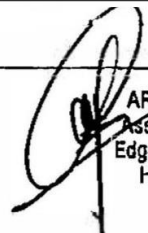


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PENANG GH- 10 DAY CLINICAL STUDY										Daily Bin Usage Log Sheet	
DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	TOT	%
28/02/18	01/03/18	02/03/18	03/03/18	04/03/18	05/03/18	06/03/18	07/03/18	08/03/18	09/03/18		
CURRENT USE OF SHARPS BINS - WARD C5											RED
2.5L										2.5L	
DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	30	
3	3	3	3	3	3	3	3	3	3		
USE OF SHARPS BINS - DURING STUDY PERIOD- WARD C5											
2.5L											
DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	5	
0	0	0	0	0	0	0	0	0	5		
# BIN REDUCTION										25	83%
CURRENT USE OF SHARPS BINS - WARD C5											
5L										5L	
DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	50	
5	5	5	5	5	5	5	5	5	5		
USE OF SHARPS BINS - DURING STUDY PERIOD- WARD C5											
5L											
DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	1	
0	0	0	0	0	0	0	0	0	1		
# BIN REDUCTION										49	98%
CURRENT USE OF SHARPS BINS - WARD C5											
10L										10L	
DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	50	
5	5	5	5	5	5	5	5	5	5		
USE OF SHARPS BINS - DURING STUDY PERIOD- WARD C5											
10L											
DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	2	
0	0	0	0	0	2	0	0	0	0		
# BIN REDUCTION										48	96%
CURRENT USE OF SHARPS BINS - WARD C5											
20L										20L	
DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	10	
1	1	1	1	1	1	1	1	1	1		
USE OF SHARPS BINS - DURING STUDY PERIOD- WARD C5											
20L											
DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	1	
0	0	0	0	0	0	0	0	0	1		
# BIN REDUCTION										9	90%
BIN REDUCTION SAVINGS IN DOLLARS											
	2.5L	5L	10L	20L	TOT						
CURRENT COST	\$135.00	\$277.00	\$453.00	\$159.70	\$1,024.70						
NEW COST	\$22.50	\$5.54	\$18.12	\$15.97	\$62.13						
TOTAL SAVINGS EA.	\$112.50	\$271.46	\$434.88	\$149.73	\$968.57						

Date: 9/03/18 Signature: _____ :-


ARUMOGAM A/L RAJOO
 Assistant Facility Manager
 Edgenta Mediserve Sdn Bhd
 Hospital Pulau Pinang



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In addition to the Sharps Bins, the yellow bio-hazard poly bags will be recorded at the end of each day, the number of Poly Bag count will be provided to Study Coordinator: Patrick Reagan. The daily bag usage will be recorded into the Daily Bag Usage Table (figure 4) and verified by UEM Edgenta Director- Mr. Jega.

****NO CHANGE IN POLY BAG USAGE DURING THE STUDY ****

Correlation of the raw data collection to the output/measured parameters. From the raw data collected during the study period, we can determine the actual percentage of sharps container reduction. According to our testing, 80 - 85 % reduction is what our savings proposal is based on.

Variables in this Study

Independent Variable: The needle- less plastic syringe and cap.

The incinerated contents of the Terminator swarf tube.

Dependent Variable: The decrease of 2.5L, 10L and 20L Bins needed.

The change of Poly Bags used if any.

Control/Constant Variables: Number of Bins used currently.

Number of Poly Bags used currently.

Bin Sizes: 2.5L, 5L, 10L, 20L

Poly Bag Sizes: 5L, 30L, 100L

Syringe Types: 18g-29g - 3 cc, 5 cc, 10 cc, 20 cc, 50 cc, 22g IV 36ml

Prior Needle-Stick Incidents (reported)

Ward C5 2017 YTD: 3 (three) incidents

UEM 2016: 3 (three) incidents reported Jan. 2017

Extension of Study Period:

If none of the Bins of any of the three sizes have not been collected due to the decrease in waste, then we might record 100% reduction of Sharps Bin. To have accurate data to compile, we would have to extend the period of the study.

Estimated cost of the study: \$7,900 usd

Actual Cost of the study: \$10,500 usd

*SharpsAid/Sharps Terminator LLC wholly responsible for cost.

Prepared by:

Patrick Reagan- Study Coordinator



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PENANG GENERAL HOSPITAL REVISED SAVINGS SUMMARY

Hospital : PENANG GH Month July 2016: Jul-16																							
No. of T-Units	User Department	No of Trtmnt Trolley (Unit)	W1				W2				W3				W4				TOTAL				Total Bins
			2.5ltr	5ltr	10ltr	20ltr	2.5ltr	5ltr	10ltr	20ltr	2.5ltr	5ltr	10ltr	20ltr	2.5ltr	5ltr	10ltr	20ltr					
0	1 MRI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0			
2	2 A & E	3	-	-	14	16	-	-	14	16	-	-	14	16	-	-	14	16	-	-	56	64	120
0	3 A & E 015K	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
1	4 ORTHOPEDIC	4	-	-	5	-	-	-	5	-	-	-	5	-	-	-	5	-	-	-	20	-	20

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
88	2	83 WAD A 1	5	-	-	14	-	-	-	14	-	-	-	14	-	-	-	14	-	-	-	56	-	56	
89	1	84 BURN UNIT	3	3	3	-	-	3	3	-	-	3	3	-	-	3	3	-	-	12	12	-	-	24	
90	0	85 AGO 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
91	0	86 METHADONE	1	7	-	-	-	7	-	-	-	7	-	-	-	7	-	-	-	0	-	-	-	0	
92	0	87 WAD PSY MALE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
93	0	88 WAD PSY FEMALE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
94	1	89 WAD PALIATIF	1	-	-	-	21	-	-	-	21	-	-	-	21	-	-	-	21	-	-	-	84	84	
95	0	90 ONKOLOGY CLINIC	4	-	-	1	-	-	-	1	-	-	-	1	-	-	-	1	-	-	-	0	-	0	
96	0	91 HDU UNIT	4	-	-	21	-	-	-	21	-	-	-	21	-	-	-	21	-	-	-	0	-	0	
97	0	92 FORENSIC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
98	0	93 PHARMACY SETELIT C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
99	0	94 CDR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
100	0	95 NUKCLEAR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
101	0	96 PHARMACY PUSAT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	
102	117	Total HOSPITAL WARDS	298	89	84	507	531	89	84	507	531	89	84	507	531	89	84	507	531	394	300	1900	1924	4518	92.4% RED
103	2	SPARE UNITS																		67	6	76	192	341	
104	119																			Projected Bin Reduction:	4.47	5.54	9.06	15.97	

REPORT SUMMARY		CURRENT:					
\$324,156.00	MYR Terminator Costs @699usd	Totals Per/Mo (MYR)	\$1,761.18	\$1,662.00	\$17,214.00	\$30,726.28	\$51,363.46
Average Life Span of Sharps Terminator is 3-5 years		Current Annual Bin Costs:	\$616,361.52				
		Projected Monthly Bin Costs:	\$299.40	\$33.24	\$688.56	\$3,072.63	\$4,093.83
		Projected Annual Bin Costs:	\$49,125.94				
		Projected Annual Bin Savings:	\$567,235.36				
		Total 3 Year Savings:	\$1,377,550.08				
		Terminator Costs:	\$324,156.00				
		1ST Year Total Savings:	\$243,079.36				
		Bin Wt.	0.3	0.42	0.65	1.07	
		Current Empty Bin Wt. (kg)	118.2	126	1235	2058.68	3537.88
		Projected Empty Bin Wt. (kg)	20.094	2.52	49.4	205.868	277.882

59	2	54 WAD C 15	6	-	-	7	7	-	-	7	7	-	-	7	7	-	-	7	7	-	-	28	28	28	56
60	3	55 WAD C 6	6	-	7	7	22	-	7	7	22	-	7	7	22	-	7	7	22	-	7	7	22	88	144
61	5	56 WAD C 5	5	-	7	14	21	-	7	14	21	-	7	14	21	-	7	14	21	-	7	14	21	90	168
62	4	57 WAD C 20	7	-	-	14	21	-	-	14	21	-	-	14	21	-	-	14	21	-	-	56	84	140	
63	3	58 WAD C 15	5	-	-	14	14	-	-	14	14	-	-	14	14	-	-	14	14	-	-	56	56	112	
64	2	59 WAD C 15	7	-	-	14	7	-	-	14	7	-	-	14	7	-	-	14	7	-	-	56	28	84	
65	2	60 WAD C 16	4	-	-	14	21	-	-	14	21	-	-	14	21	-	-	14	21	-	-	56	84	140	