

Healthcare –Associated Viral Hepatitis Infection Prevention Project:
Injection and Assisted Blood Glucose Monitoring Practices in Long Term Care Facilities
Summary Report

April 7, 2015

Background:

Between 2008 and 2014 CDC documented 44 known viral hepatitis outbreaks associated with healthcare in the United States (<http://www.cdc.gov/hepatitis/Outbreaks/HealthcareHepOutbreakTable.htm>). In total, these outbreaks resulted in the identifications of 410 cases of Hepatitis B or C which were tied to unsafe medical care. The majority of these outbreaks (42 out of 44) occurred in non-hospital settings. The Michigan Department of Community Health (MDCH) has been involved in several of these outbreaks in recent years.

In November 2012, the MDCH received funding from the Center for Disease Control and Prevention (CDC) to conduct a viral hepatitis project to prevent the spread of HBV and HCV in healthcare settings by promoting and raising awareness of the CDC's safe injection and assisted blood glucose monitoring guidelines. The ultimate goal was to improve knowledge regarding appropriate injection and blood glucose monitoring practices among Michigan healthcare workers (HCWs).

Overview:

To expand educational efforts surrounding safe injection and assisted blood glucose monitoring practices the MDCH Viral Hepatitis Unit promoted a webinar titled Injection Safety: Preventing Viral Hepatitis Infections (<http://prezi.com/gpu4eo03d8hs>) via the MDCH viral hepatitis website (www.mi.gov/hepatitis). Promotion targeted Long Term Care Facilities (LTCFs) because these facilities provide assisted diabetes management on a regular basis and have been implicated in healthcare outbreaks associated with poor injection safety procedures. Previous MDCH educational campaigns targeted Ambulatory Surgical Centers (ASCs).

In December 2013, the MDCH staff contacted 447 LTCF administrators via e-mail. Administrators were invited to view the recorded version of the webinar. Administrators were also encouraged to share the webinar with their HCWs who prepare or administer injectable medications, utilize diabetes management devices, or those who train staff on infection control and patient safety.

Prior to beginning the webinar participants were asked to complete a short pre-test. The evaluation included six true/false questions on injection safety topics and three demographic questions. After completing the pre-test participants were given a link to the webinar. The webinar presentation included an overview of viral hepatitis A, B, and C transmission and basic infection control, safe injection, and assisted blood glucose monitoring practices. The presentation was 52 minutes in duration. After viewing the webinar participants were given the opportunity to voluntarily complete a post-test in exchange for a certificate of completion. A total of 222 people completed the pre-test and 179 completed the post-test. This report discusses the findings from these surveys.

Description of Participants

Professional Background					
		Pre-evaluation (n=222)		Post-evaluation (n=179)	
Primary occupations:		#	%	#	%
	Non-Clinical Staff	26	12.0	7	4.0
	Nurse	183	82.0	163	91.0
	Physician/Physician Assistant	0	0.0	2	1.0
	Student/Volunteer	1	0.5	2	1.0
	Technician	1	0.5	0	0.0
	Unknown	11	5.0	5	3.0
Number of yrs working:					
	Less than 1 year	3	1.0	3	2.0
	1 to 5 Years	31	14.0	33	18.0
	6 to 10	34	15.0	31	17.0
	11 to 20 years	44	20.0	35	20.0
	21 to 30 years	52	23.0	34	19.0
	31 or More	46	21.0	38	21.0
	Unknown	12	5.0	5	3.0
Work setting:					
	Ambulatory Surgery Center	1	0.5	1	0.5
	Hospital	8	4.0	3	2.0
	Long Term Care Facility	203	91.0	167	93.0
	Private Office	1	0.5	2	1.0
	Unknown	9	4.0	6	3.5

Injection & Infusion Safety

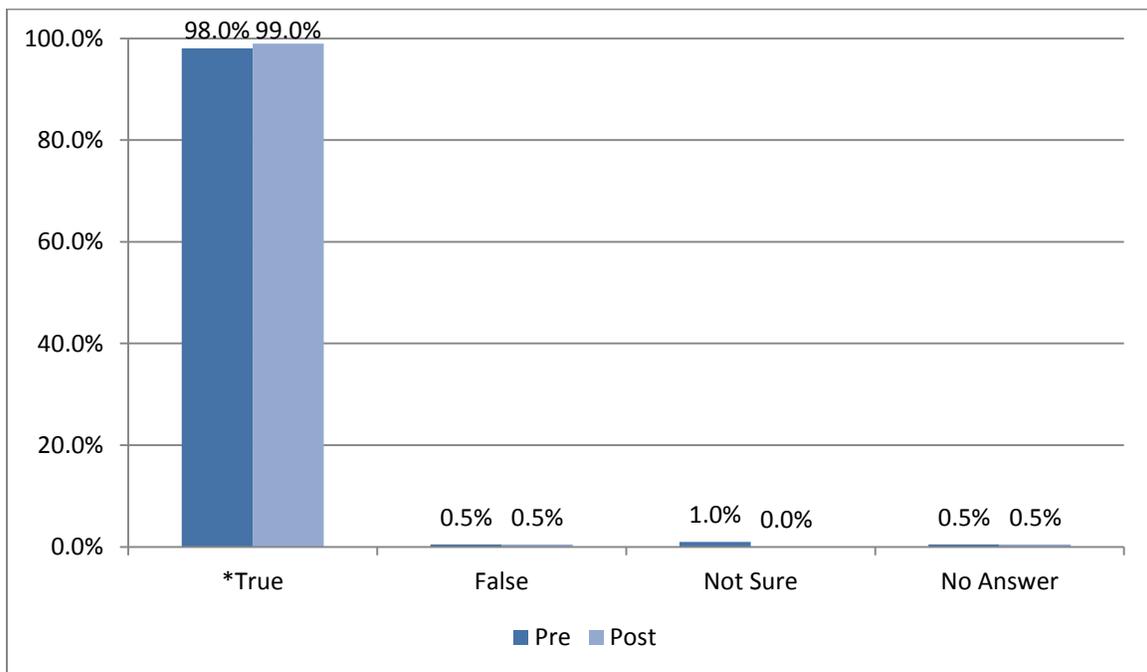
CDC Recommendation:

“Do not administer medications from a syringe to multiple patients, even if the needle or cannula on the syringe is changed.”

“Needles, cannulae and syringes are sterile, single-use items; they should not be reused for another patient nor to access a medication or solution that might be used for a subsequent patient.”

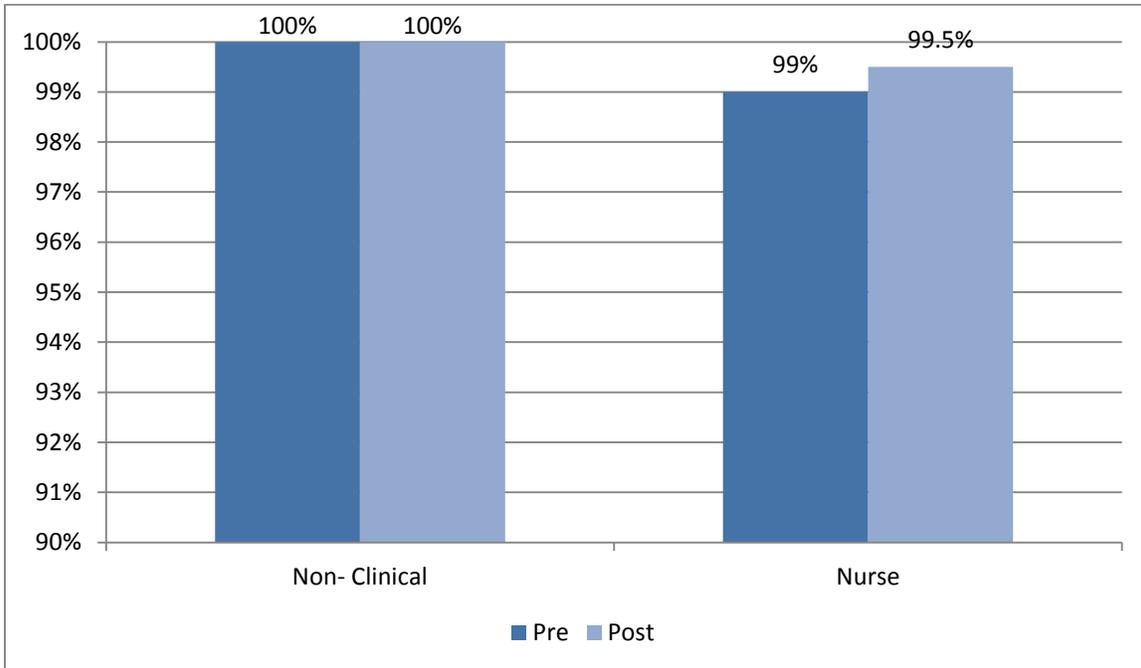
Figure 1: Single Use Injection Items

Syringes and needles are single use items should be used to give one injection.



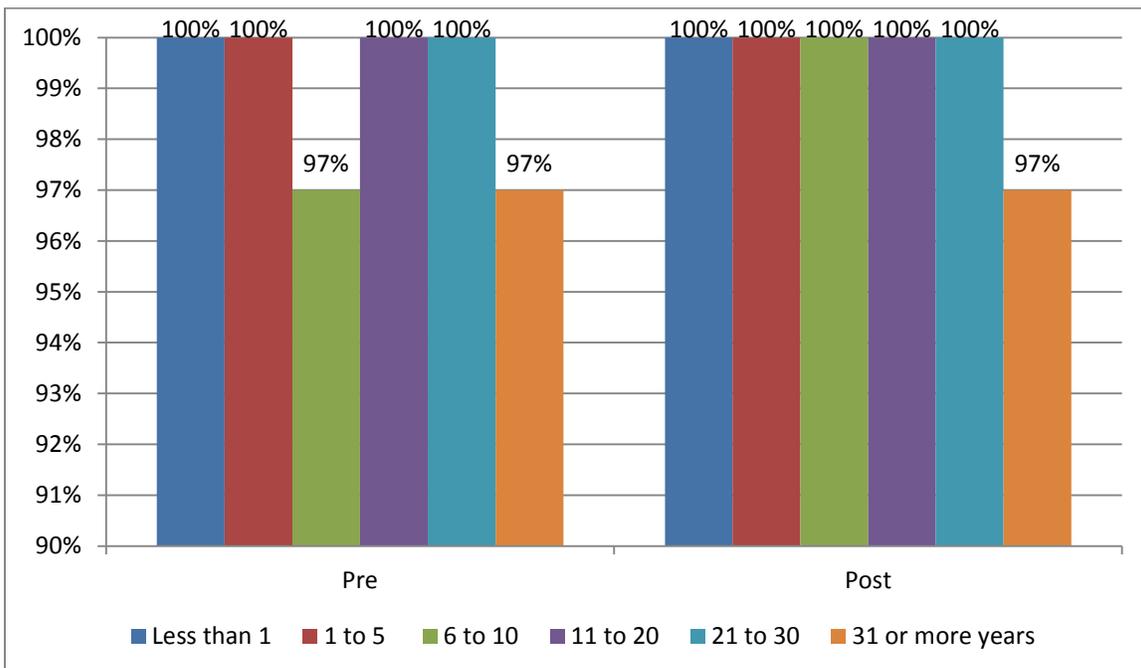
The majority of participants correctly identified that ‘Syringes and needles are single use items and should be used to give one injection’. The proportion of persons who were not sure how to answer this question decreased from 1% to 0% and the proportion identifying this statement as true increased from 98% to 99%.

Figure 2: Single Use Injection Items ‘true’ response nurse vs non-clinical staff



This figure compares non-clinical and nurse correct response for the statement ‘Syringes and needles are single use items and should be used to give one injection’. We see that all of the non-clinical staff that responded to this survey item correctly indicated that statement as true. While nearly all nurses indicated the statement as true.

Figure 3: Single Use Injection Items Nurse ‘true’ response by years in field:



This figure shows that on the pretest 97% of the nurses who had been in the field for ‘6 to 10 years’ and ‘31 or more years’ correctly indicated that ‘Syringes and needles are single use items and should be used to give one injection’. We also see that in the post test there was an increase in knowledge among nurses in the field for ‘6 to 10’ years when compared to the pretest.

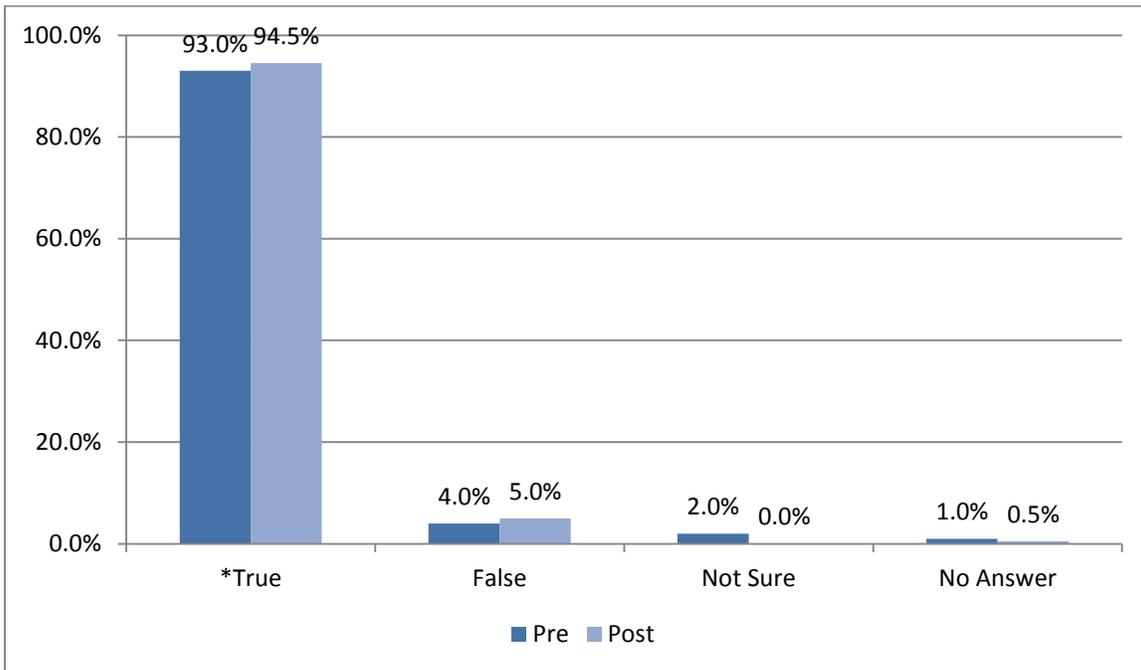
CDC Recommendation:

“Do not use bags or bottles of intravenous solution as a common source of supply for multiple patients”

“Use fluid infusion and administration sets (i.e., intravenous bags, tubing and connectors) for one patient only and dispose appropriately after use. Consider a syringe or needle/cannula contaminated once it has been used to enter or connect to a patient's intravenous infusion bag or administration set”

Figure 4: Intravenous Solution Use

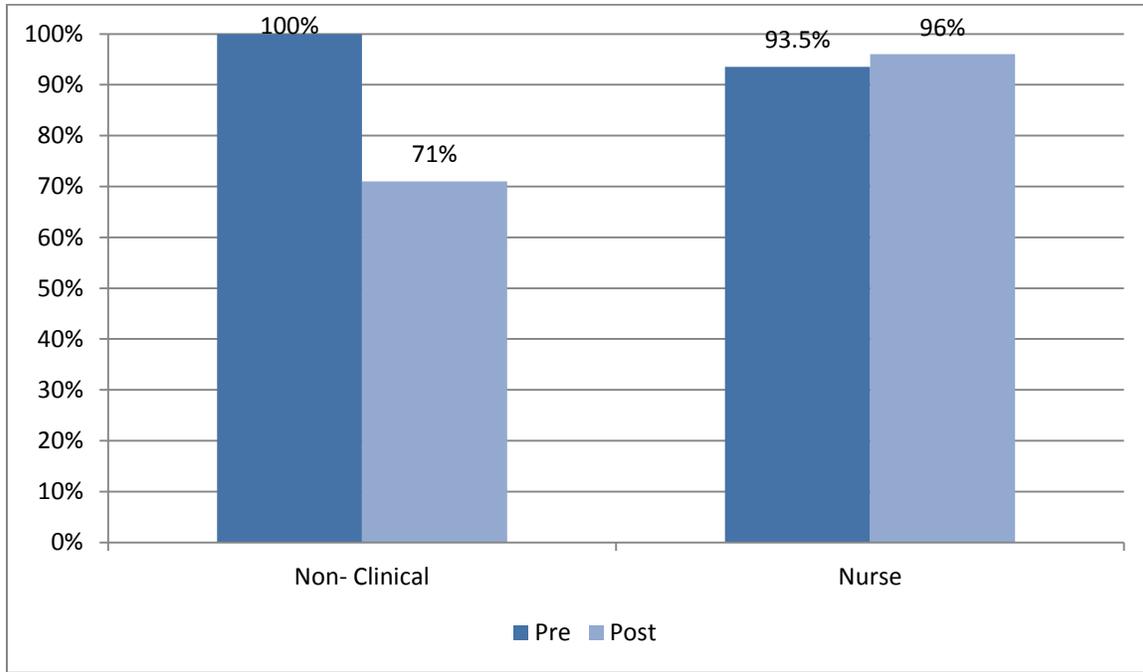
Bags or bottles of intravenous solution should be used as a source of supply or medication diluent for one patient.



The majority of participants correctly identified ‘Bags or bottles of intravenous solution as a source of supply or medication diluent for one patient’. The number of persons that were unsure of the answer declined from 2% to 0% and the proportion of persons who identified the statement as being true rose by 1.5%. Unexpectedly, the number of respondents who answered false rose from 4% to 5%.

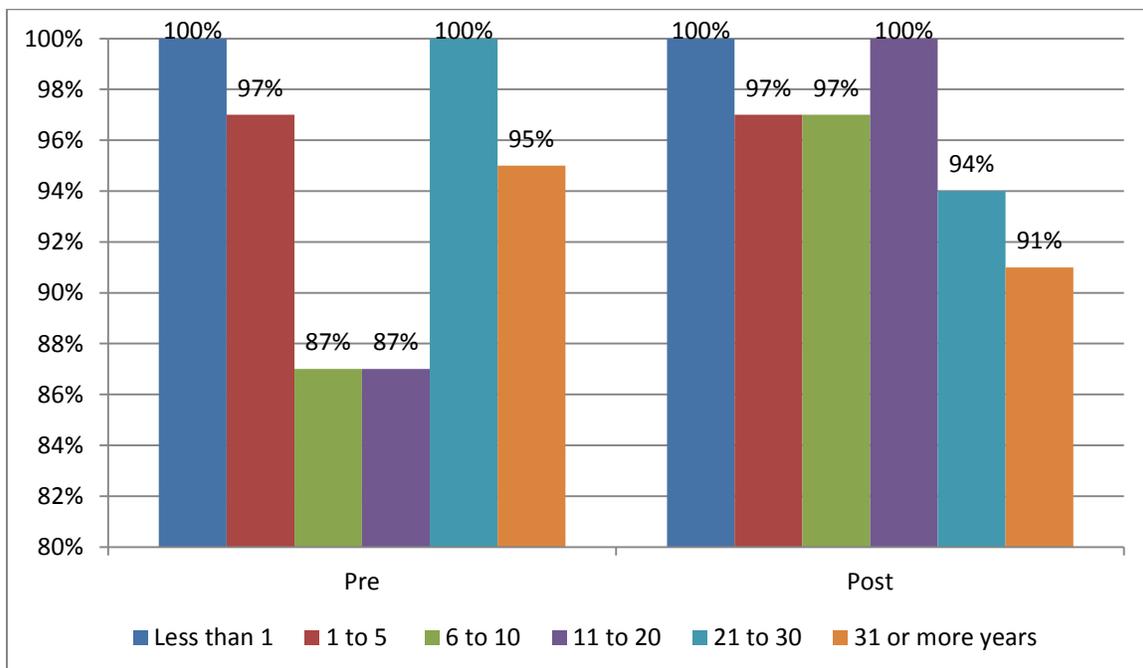
This question may have been worded poorly. Perhaps it could have been written ‘bags or bottles of intravenous solution should be used as a source of supply or medication diluent for **ONLY** one patient.’

Figure 5: Intravenous Solution Use 'True' response nurse vs non-clinical staff



This figure compares nurse and non-clinical staff correct response for the statement 'Bags or bottles of intravenous solution should be used as a source of supply or medication diluent for one patient'. We see that there was increase in correct response among nurses in the post-test when compared to the pre-test. Surprisingly, of the non-clinical staff that responded to this question, 100% correctly indicated that the statement was true on the pre-test while only 71% correctly indicated that statement as true on the post-test.

Figure 6: Intravenous Solution Use 'True' response Nurse by years in field



Medication Vial Safety

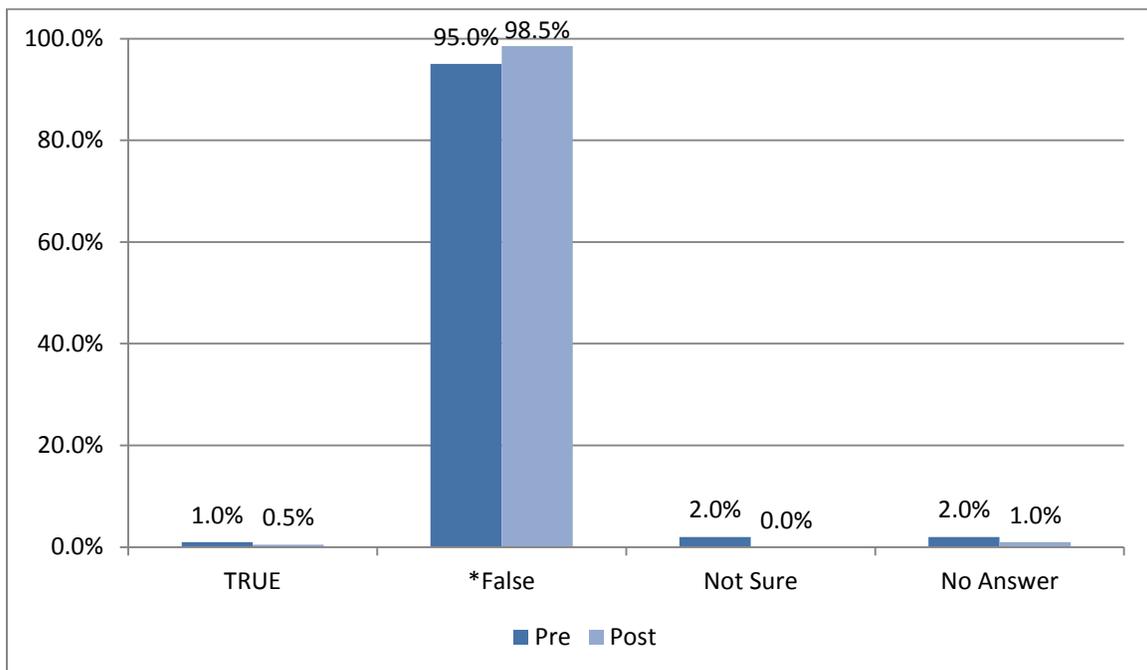
CDC Recommendation:

“Do not administer medications from single-dose vials or ampules to multiple patients or combine leftover contents for later use”

“Never use medications packaged as single-dose or single-use for more than one patient. This includes ampoules, bags, and bottles of intravenous

Figure 7: Medication Pooling

It is sometimes acceptable to combine or pool leftover medications from single-dose vials (e.g. to avoid medication wasting).



The majority of participants correctly identified ‘It is sometimes acceptable to combine or pool leftover medications from single-dose vials’ as a false statement. The number of correct responses increased from 95% to 98.5%, while the proportion of those not sure and those answering ‘true’ decreased.

Figure 8: Medication Pooling Knowledge 'False' response nurse vs non-clinical staff

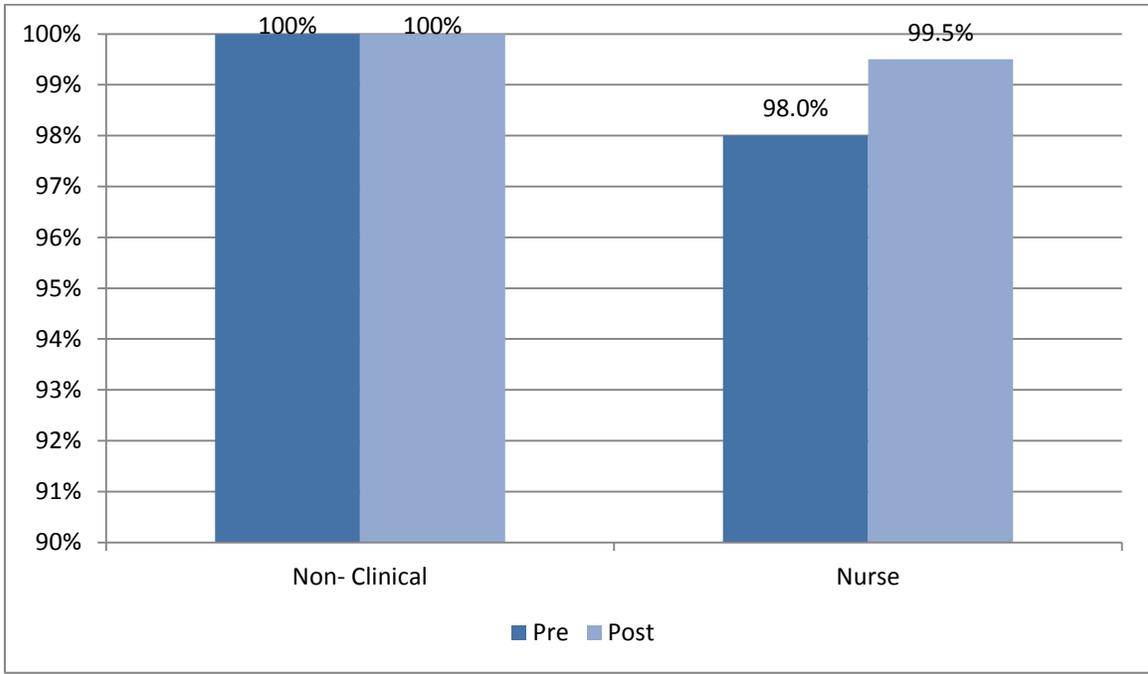
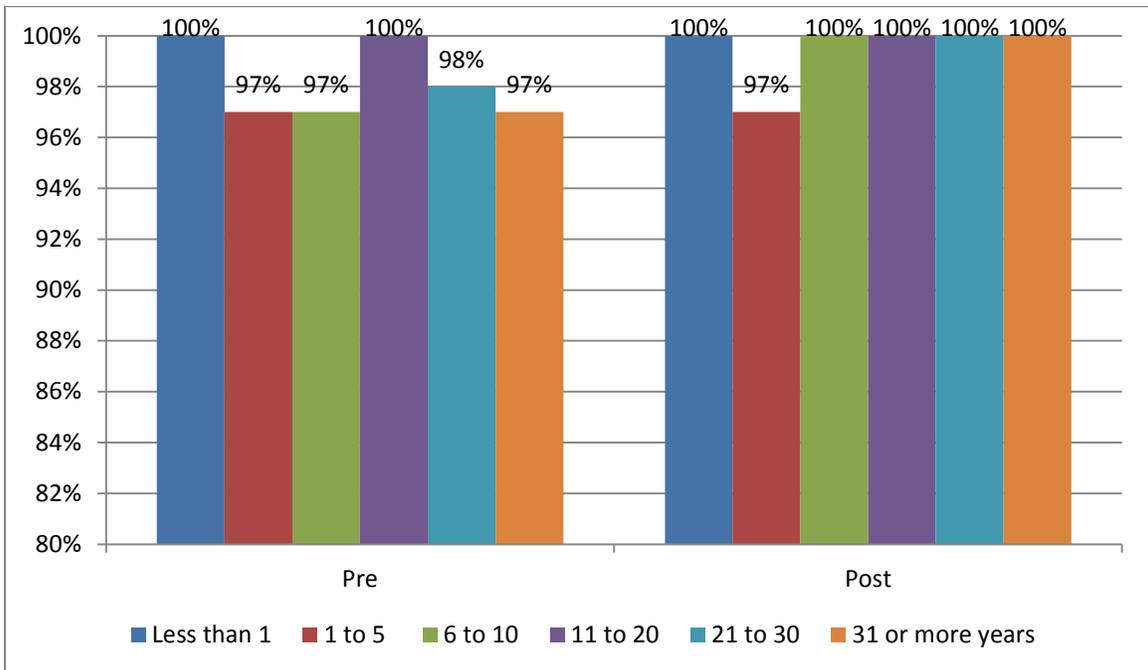


Figure 9: Medication Pooling Knowledge 'False' response Nurse by years in field



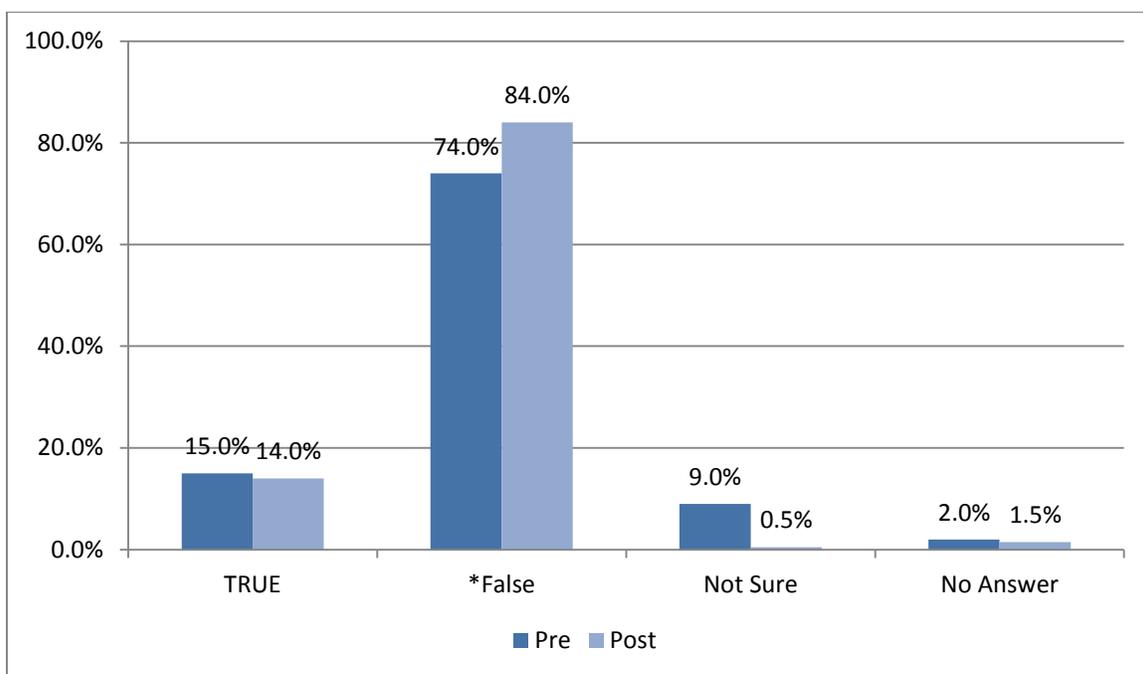
CDC Recommendation:

“Multi-dose vials should be dedicated to a single patient whenever possible.”

“Do not keep multidose vials in the immediate patient treatment area and store in accordance with the manufacturer's recommendations; discard if sterility is compromised or questionable.”

Figure 10: Medication Storage

Medications from multi-dose vials should be stored in immediate patient treatment areas (such as patient rooms, operating rooms, pre- or post-op).



The majority of participants correctly identify the statement ‘Medications from multi-dose vials should be stored in immediate patient treatment areas’ as false. Correct responses increased from 74% in the pre-test to 84% in the post-test. This was associated with a 8.5% drop in the number of persons not sure how to answer the question in the pre-test. Overall though, the percentage of correct responses was lower than in previous questions. This suggests that storage and use of multidose vials is not as well understood by HCWs.

Figure 11: Medication Storage 'False' response nurse vs non-clinical staff

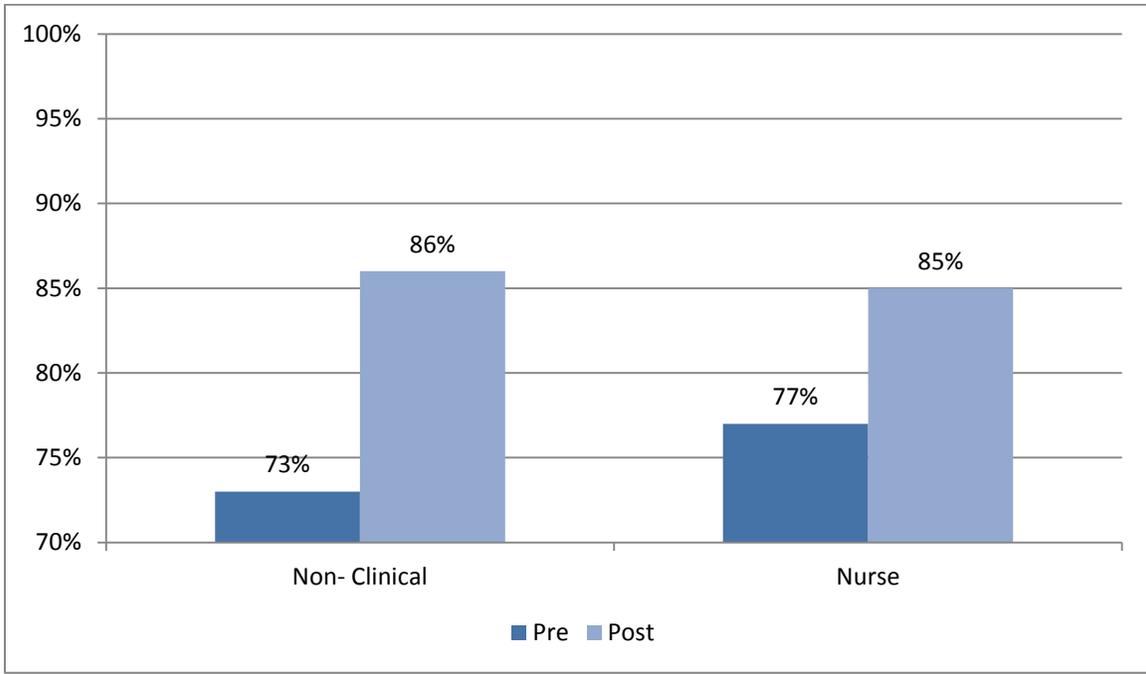
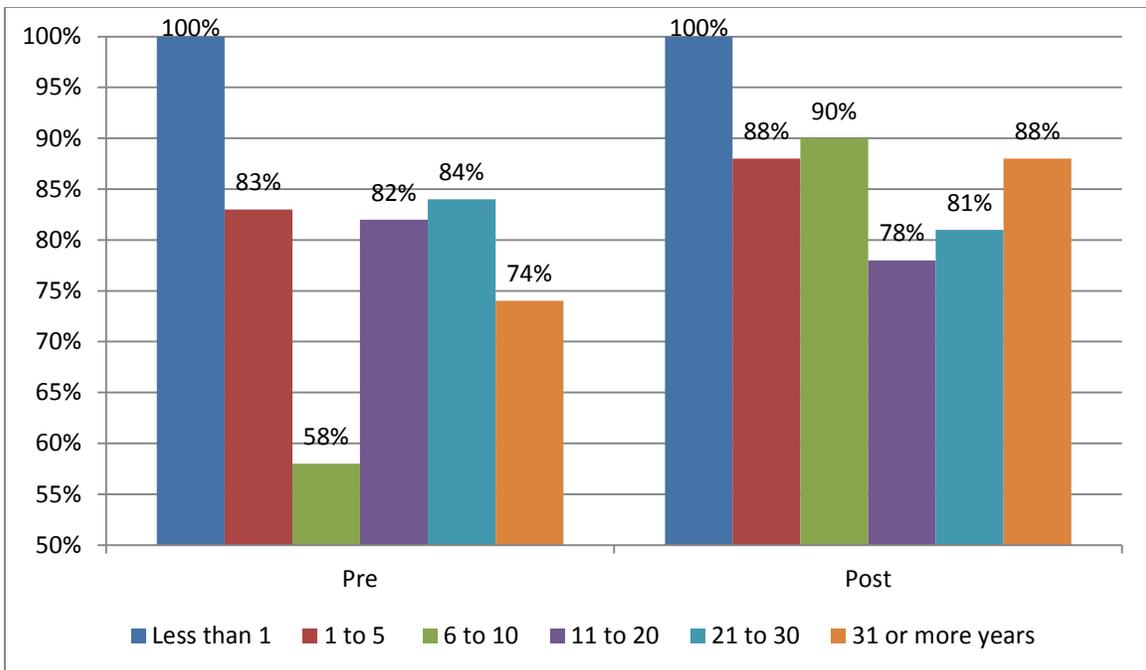


Figure 12: Medication Storage 'False' response Nurse by years in field



The proportion of HCWs who identified the correct response to this statement rose in for each level of experience.

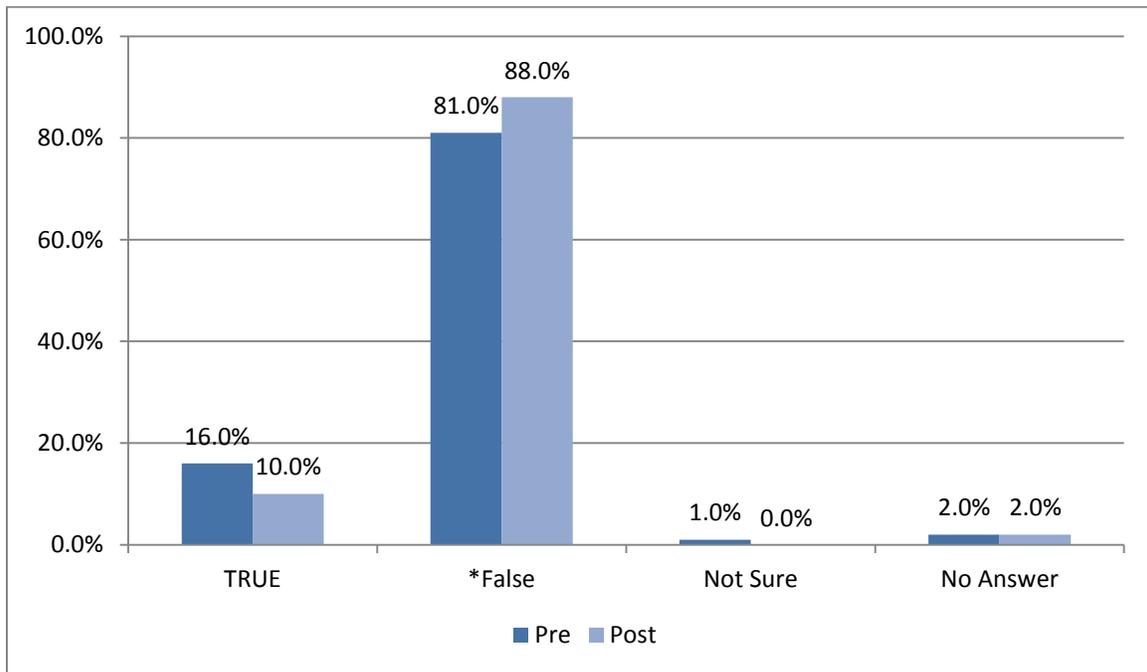
Fingerstick Device & Insulin Pen Safety

CDC Recommendation:

“Fingerstick devices should never be used for more than one person.”

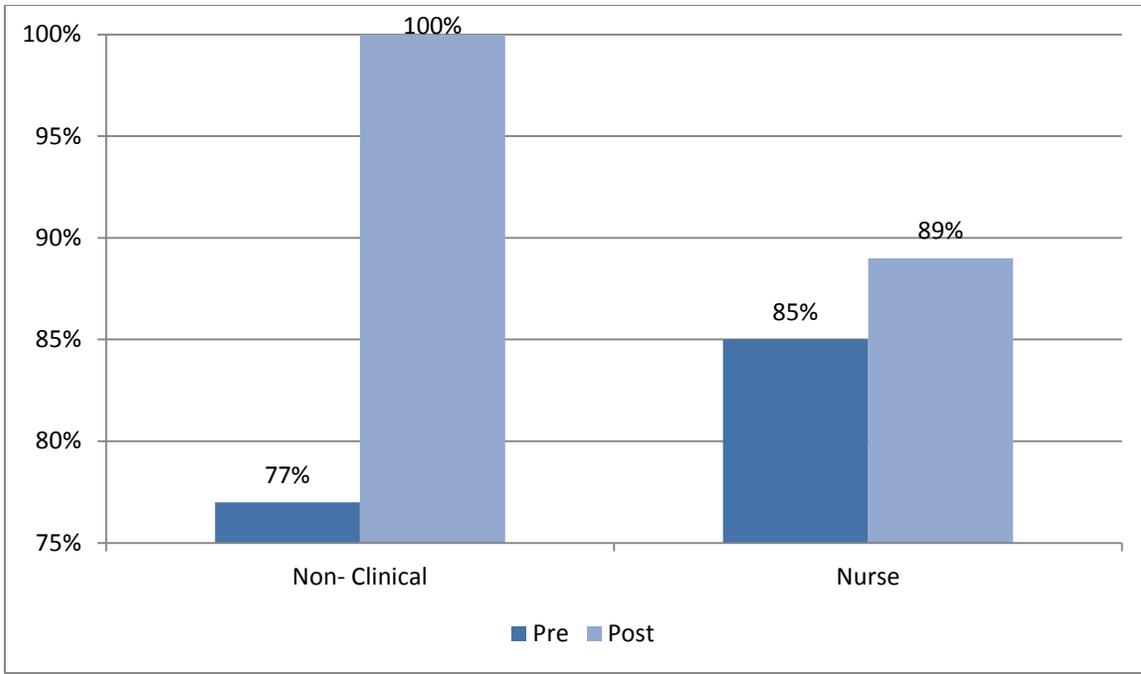
Figure 13: Fingerstick device use

Fingerstick devices can be used on more than one patient.



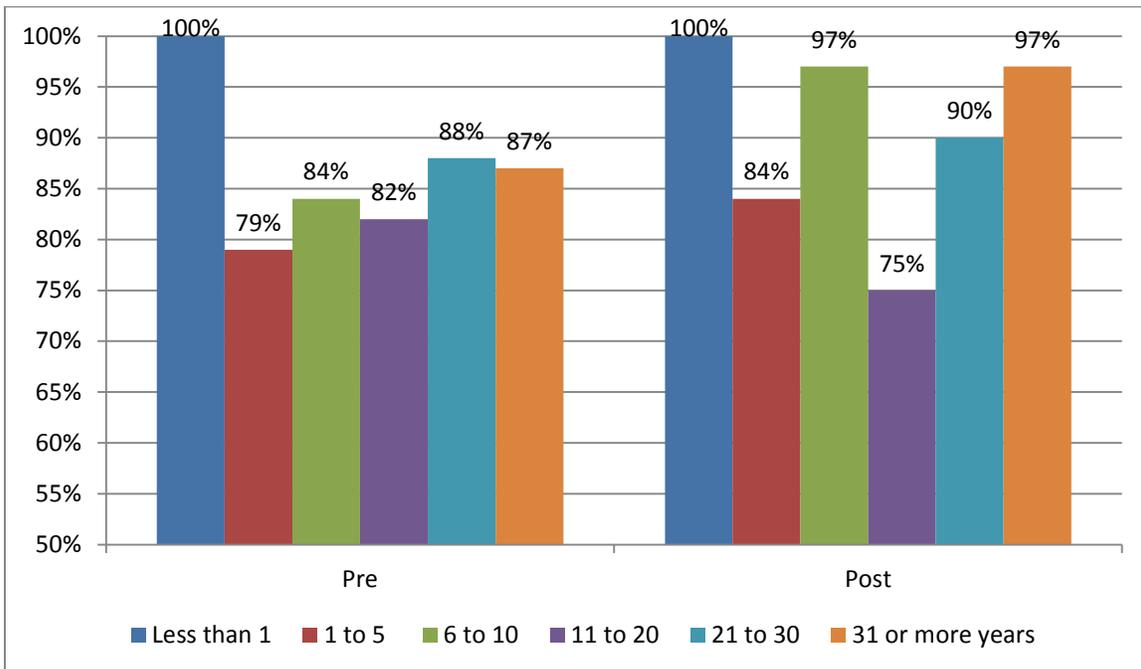
The majority of participants correctly identified ‘Fingerstick devices can be used on more than one patient’ as a false statement. The number of incorrect responses decreased by 6% while the number of correct responses rose by 7%. Still, this seems to be an area where HCW knowledge of CDC’s recommended best practices is lacking. This remains an area of need and will be a focus of MDCH efforts in future projects regarding injection safety.

Figure 14: Fingerstick devices use 'False' response nurse vs non-clinical staff



There was an increase of correct responses among both non-clinical and nurse staff when comparing the pre- and post-test. All of the non-clinical staff that responded to this survey item correctly indicated that statement as false on the post-test.

Figure 15: Fingerstick device use 'False' response Nurse by years in field



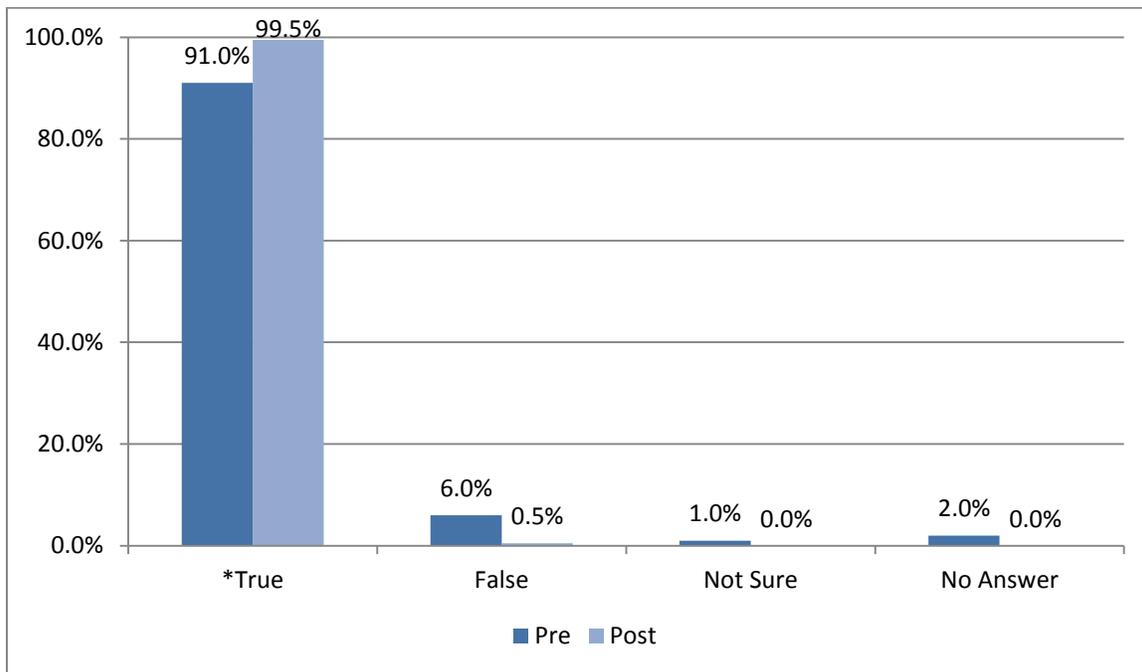
For all levels of experience knowledge of CDC's recommendation increased except for those with 11-20 years of experience.

CDC Recommendation:

“Insulin pens and other medication cartridges and syringes are for single-patient-use only and should never be used for more than one person.”

Figure 16: Insulin pen use

Insulin pens should be used on one patient.



The majority of participants correctly identified that 'Insulin pens should be used on only one patient'. The number of survey participants who correctly identified this statement as true increased from 91% to nearly 100% while the number of incorrect responses decreased by 5.5%.

Figure 17: Insulin pen use 'True' response nurse vs non-clinical staff

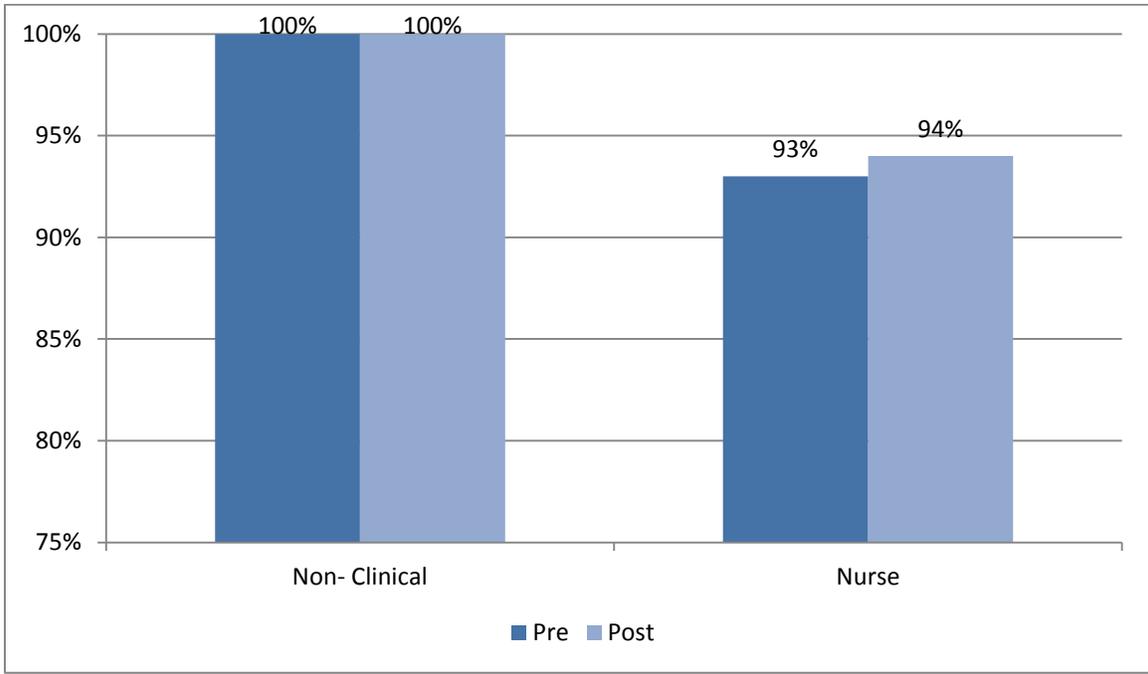
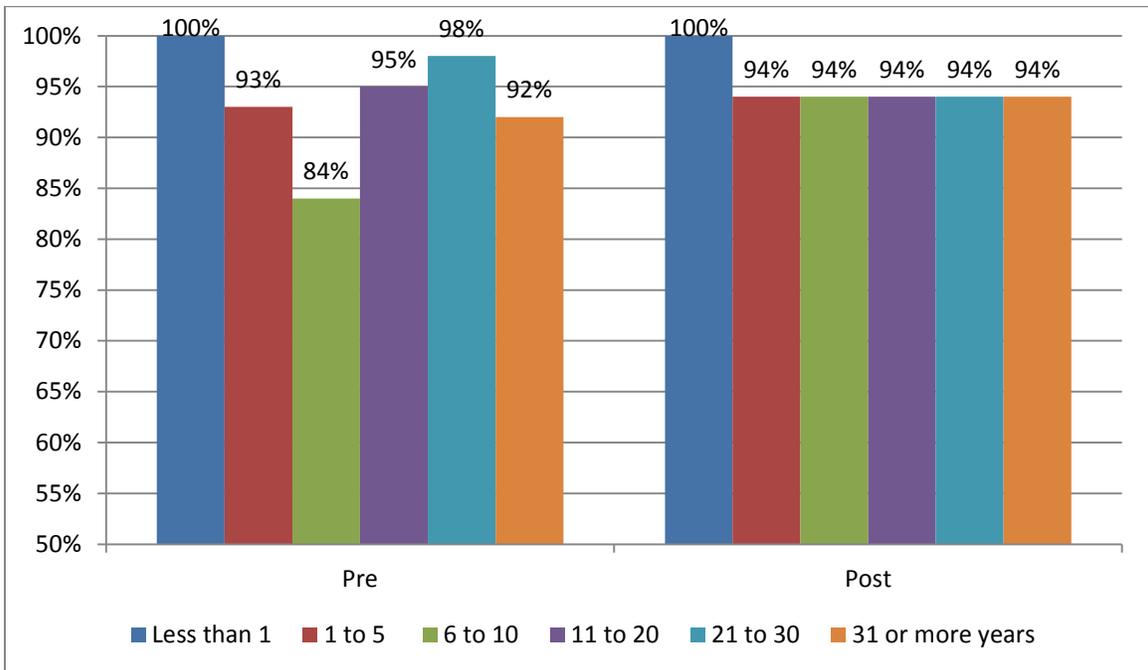


Figure 18: Insulin pen use 'True' response Nurse by years in field



Limitations

In general, the largest limitations of our survey is sample size and representativeness of the population. The small sample size limits our ability to generalize our findings to the entire population of LTCF staff in Michigan. Given the small percentage of the population represented there is a possibility of survey bias; with those viewing the webinar and completing both the pre- and post-test being significantly different than those who chose not to participate. Therefore, we cannot be sure that the safe injection and assisted blood glucose monitoring knowledge of the sample populations are representative of the entire LTCF population. To reduce the impact of this limitation, future research should utilize supplementary recruitment measures to increase the number of LTCF staff in the study. Survey data may also not be generalizable to staff in other settings (e.g. acute care, ambulatory surgery center).

The specific method used for gathering data is also a potential limitation. All data for this project was collected via web-based surveys. Not all LTCF HCWs would necessarily have access to a computer for administration of the surveys and for viewing the webinar. In addition, because we did not collect any identifying information, we had no way of linking an individual's pre-test to their post-test.

Summary of Findings and Discussion

Figure 19. Proportion of correct responses

Question	Pre-Test (n=222)	Post-Test (n=179)	% Change
Syringes and needles are single use items and should be used to give only one injection	98%	99%	↑ 1%
Bags or bottles of intravenous solution should be used as a source of supply for patients	93%	94.5%	↑ 1.5%
It is sometimes acceptable to combine or pool leftover medications from single dose vials	95%	98.5%	↑ 3.5%
Multi-dose medication vials should be stored in immediate patient treatment areas	74%	84%	↑ 10%
Fingerstick devices can be used for more than one patient	81%	88%	↑ 7%
Insulin pens can be used on more than one patient	91%	99.5%	↑ 8.5%

Over 90% of survey respondents were from LTCFs, indicating that our recruitment strategy was successful in regard to targeting LTCFs. In this population, we observed an increase in knowledge of CDC's injection safety and blood glucose monitoring practices in all categories addressed in the pre- and post-test. This suggests that our educational webinar was successful in increasing HCW knowledge. Even though the rise in knowledge is small for some of the questions, this could potentially have a large impact. One must consider that these

HCWs may perform dozens of injections each day and over the course of a year and a career the numbers add up. So even changing the injection safety practices of a few providers could have a tremendous effect.

Our results also show the need for increased education efforts in regard to multidose vial and fingerstick device usage. These questions were most often missed by HCW and should remain the focus of future injection safety education and training projects.

The goal of our project is to increase the proportion of healthcare workers who are educated on CDC's injection and assisted blood glucose monitoring safety guidelines and follow them in practice, thus resulting in safer injections for Michigan patients. This webinar and associated pre and post surveys helped determine baseline knowledge of injection safety guidelines in Michigan LTCFs and areas of greatest need for future educational efforts. Further outreach is needed to educate and assess a larger proportion of LTCF staff within Michigan.

If you have any further questions about this project, please contact the Michigan Department of Community Health, HIV/STD/Body Art/TB/Viral Hepatitis Section at 517-335-8165 or MDCH-Hepatitis@michigan.gov.

More information on Injection Safety can be found at <http://www.michigan.gov/Hepatitis> and <http://www.cdc.gov/injectionsafety/>