

Healthcare –Associated Viral Hepatitis Infection Prevention Project:
Injection and Assisted Blood Glucose Monitoring Practices in Ambulatory Surgical Centers
Summary Report
August 8, 2014

Background:

Between 2008 and 2012 the Centers for Disease Control and Prevention (CDC) documented 35 known viral hepatitis outbreaks associated with healthcare in the United States. In total, these outbreaks resulted in the identification of 311 cases of Hepatitis B or C that were tied to unsafe medical practices. The majority of these outbreaks occurred in outpatient or long-term care settings, not hospitals. The Michigan Department of Community Health (MDCH) has also been involved in several of these outbreak investigations in recent years. Transmission of communicable diseases as a result of poor injection safety practices has been deemed a ‘never event’ and therefore should not occur in any healthcare setting.

In November 2012, the MDCH received funding from the CDC to conduct a viral hepatitis project aimed at preventing the spread of Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) in healthcare settings by promoting and raising awareness of the CDC’s safe injection and assisted blood glucose monitoring guidelines. The goal of this project is to increase the proportion of injections given in Michigan healthcare facilities that are consistent with CDC’s best practices. Safer injections will result in fewer transmission events affecting the Michigan population.

Overview:

To focus educational efforts the Viral Hepatitis Unit decided to conduct injection safety surveys to determine areas of greatest need. Future educational campaigns can then be focused on topics that were most frequently misunderstood by healthcare workers in the surveys. Surveys targeted Ambulatory Surgical Centers (ASCs), also referred to as Freestanding Surgical Outpatient Facilities (FSOFs), because these facilities perform a large number of injections and have been often been implicated in healthcare outbreaks associated with poor injection safety procedures. In short, we believe that these settings are an area of need.

In January 2013, the MDCH staff conducted a literature review concentrated on healthcare-associated infections (HAIs), HBV and HCV outbreaks, the CDCs recommendations for patient safety and injection safety assessments conducted by professional organizations, state and local health departments. By referencing the literature review and incorporating questions from injection safety assessments, staff developed a list of questions to assess safe injection knowledge and practice.

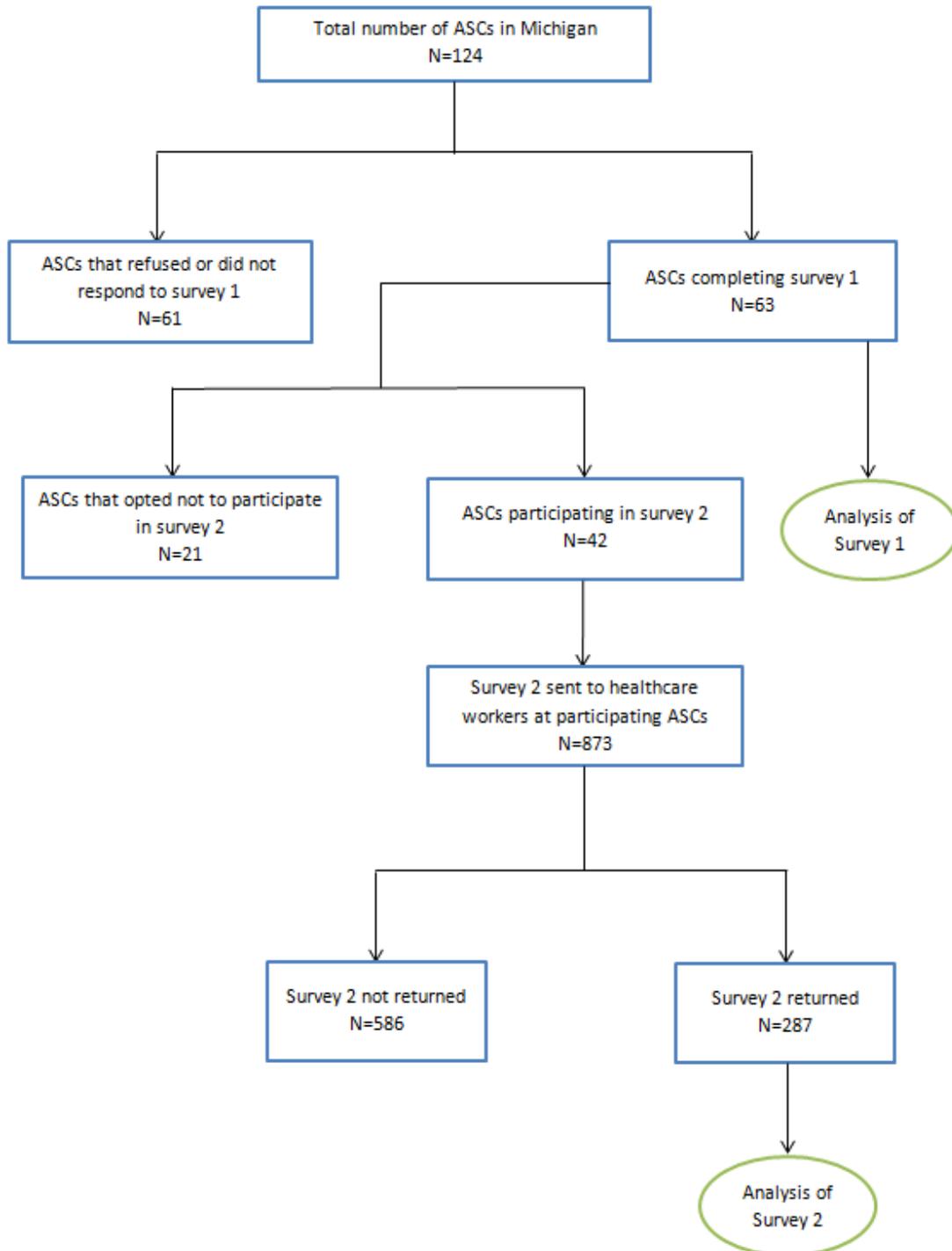
In May 2013, the MDCH Viral Hepatitis Unit began surveying ASCs within the State of Michigan. Two surveys were conducted in order to gain a comprehensive understanding of both policies and practices regarding injection and assisted blood glucose monitoring safety within these healthcare facilities. The first survey, targeted at ASC administrators, focused on facility infection control policies and trainings. The second survey was directed at healthcare workers (HCWs) and their knowledge regarding injection safety and use of blood glucose monitoring equipment.

For the initial phase of the survey, the Viral Hepatitis Prevention Coordinator (VHPC), Viral Hepatitis Data Analyst and Viral Hepatitis Nurse Consultant attempted to contact 124 ASCs by phone. Three attempts were made to contact each facility. ASC administrators who opted out of participating and those that were not

successfully contacted within the three attempts were excluded from the survey. A total of 63 ASCs participated in the infection control policy/procedure survey.

For the second phase of the survey, the VHPC mailed 873 HCW paper surveys to 42 facilities. The link to a web-based version of the survey was emailed to 29 facilities. All completed and returned surveys were included in the analysis for the HCW survey. 271 completed paper surveys were returned, as well as 16 web-based ones. A total of 287 HCWs participated in the injection safety and blood glucose monitoring survey. Questions were based on those used in similar injection safety survey studies: <http://www.ajicjournal.org/article/S0196-6553%2810%2900853-9/abstract>.

Survey Participation:



Facility and HCW Characteristics

Figure 1: Healthcare Facility Location (N=62)

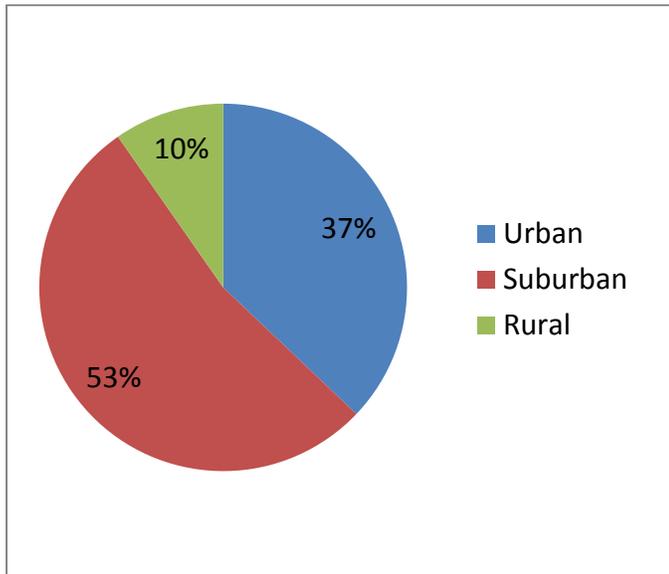
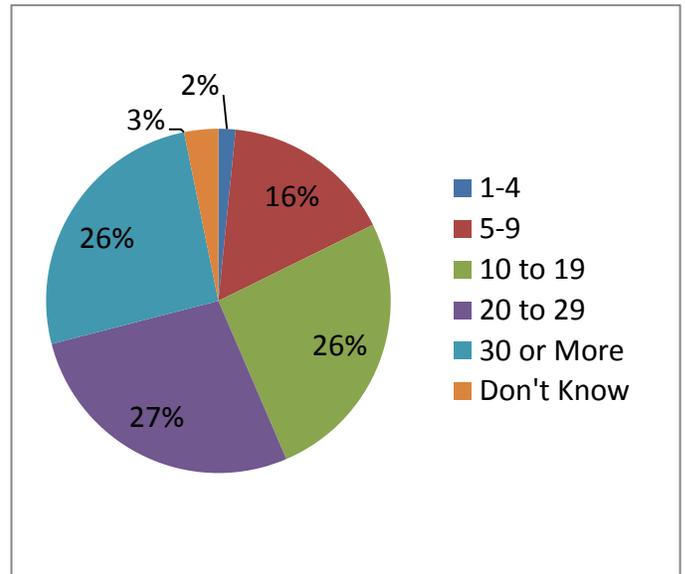


Figure 2: Number of Healthcare Personnel Employed in Facility (N=62)



Shown in Figure 1, the majority of facilities (53%) were located in a suburban area. Figure 2 demonstrates that over half (53%) of the facilities employed 20 or more healthcare workers. This illustrates the wide variety in location and size of the ASCs within Michigan. Given this variability, there may be a need to account for unique infection control needs when developing infection control policies and procedures for a facility.

The majority of the facilities surveyed (63%) were not affiliated with a larger health system, such as a hospital or university. This suggests that many ASCs in Michigan are independently operated and do not receive infection control oversight from a larger medical institution (or entity).

Healthcare Worker Demographics

Figure 3: Professional Training (N=277)

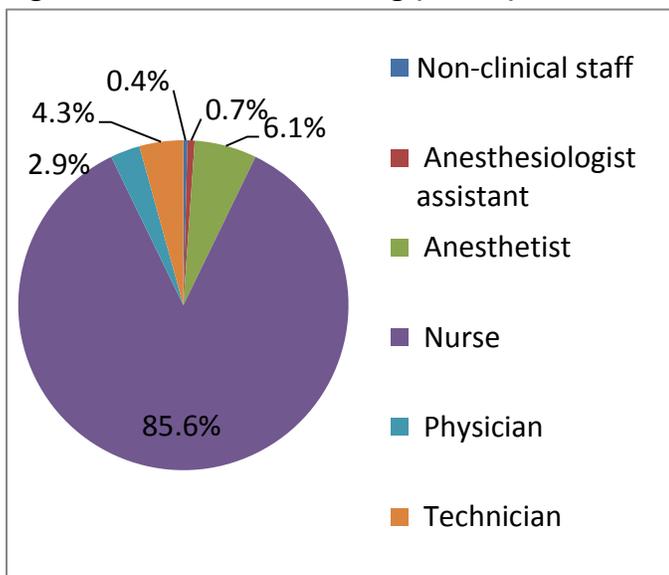
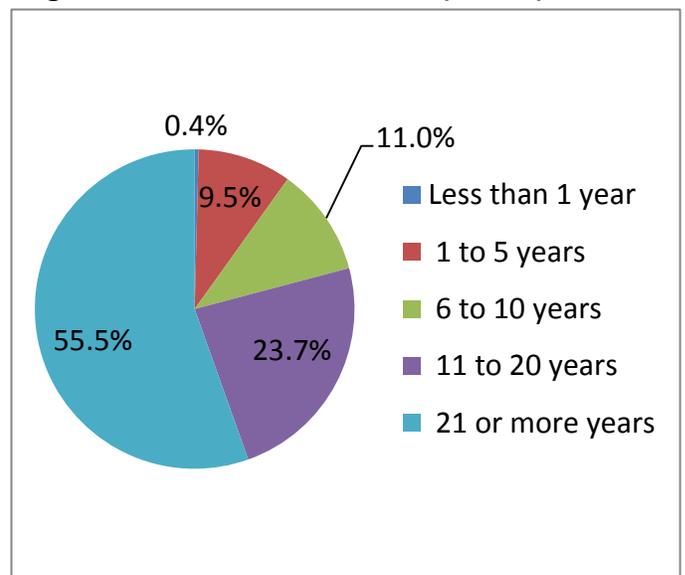


Figure 4: Years in Medical Field (N=283)



Nearly 86% of the respondents were professionally trained as nurses (Figure 3). The majority of HCWs have been in the medical profession for many years (Figure 4), with over half (56%) of those surveyed having worked in the field for more than twenty years. Approximately 10% of those surveyed are fairly new to the field, having worked for five years or less.

Figure 5: Highest Level of Schooling (N=273)

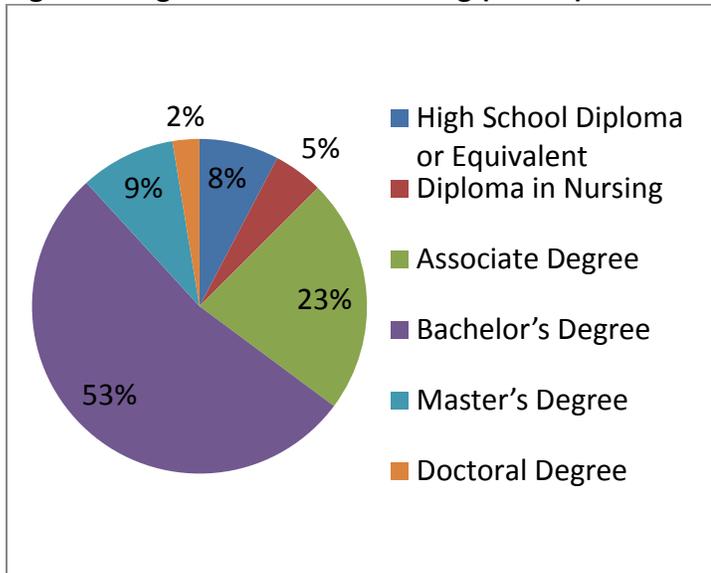


Figure 6: Safe Injection Training (N=284)

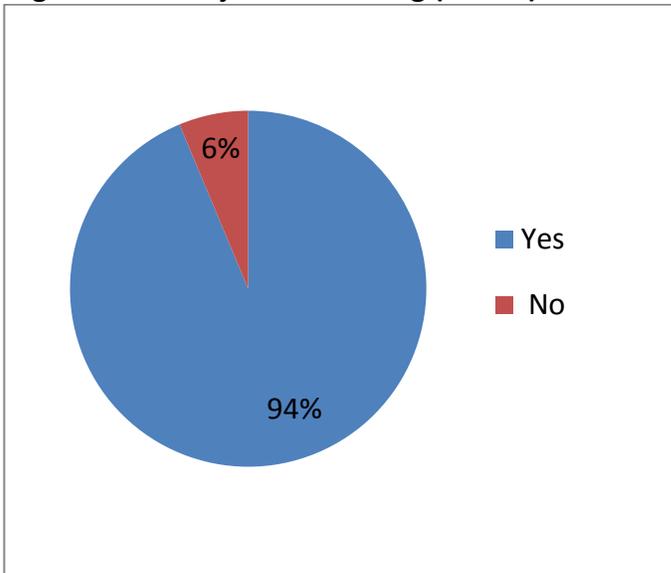
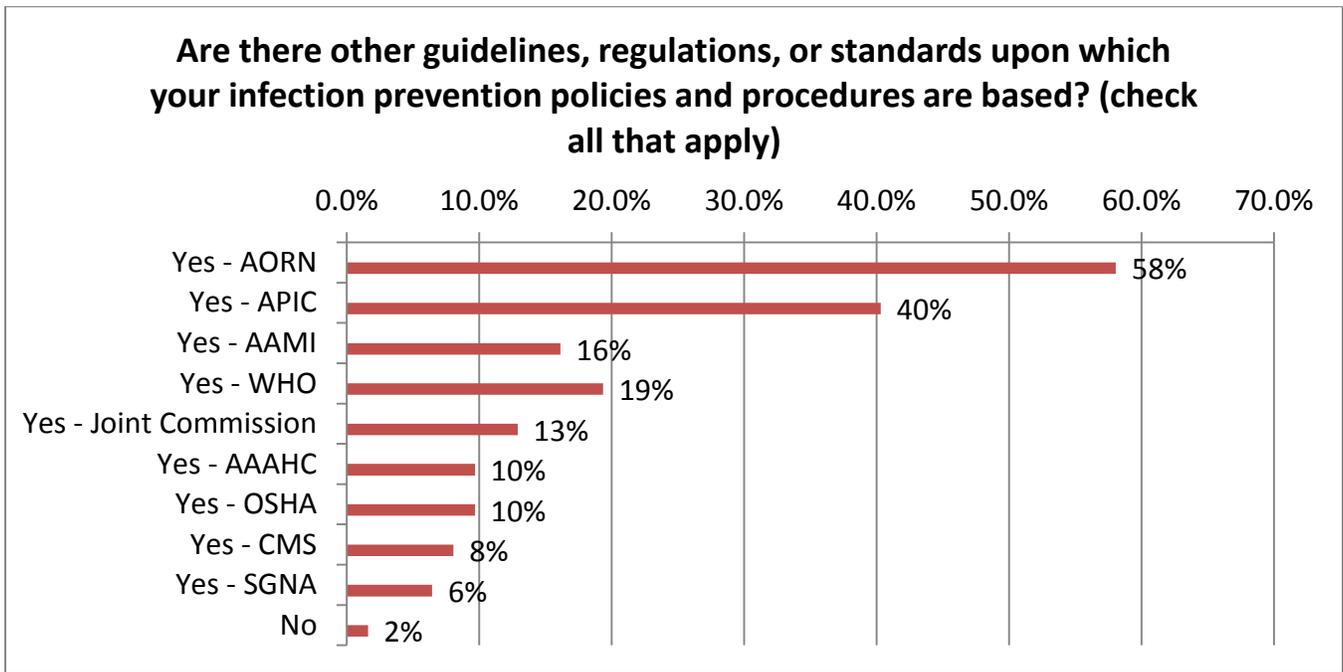


Figure 5 shows the varying levels of education achieved by HCWs. The majority (64%) have completed a Bachelor's degree or higher. HCWs were asked if they had received any specific training regarding safe injection practices and close to all (94%) stated that they had received this specialized training at some point (Figure 6).

Infection Control Policies: Injection, Medication Vial and Blood Glucose Practices

All of the administrators that completed the phone survey indicated that their healthcare facility had written infection prevention policies and procedures. They all also indicated that the facility policies were based on CDC guidelines, regulations or standards.

Figure 7: Infection Prevention Policies and Procedures Reference Standards



In addition to the CDC’s, there were a number of other guidelines, regulations or standards upon which facilities based their infection prevention policies and procedures. In Figure 7, we see that more than half (58%) of facilities based at least part of their written infection control policies and procedures on the Association of Perioperative Registered Nurses (AORN) guidelines. Additionally, 40% of facilities used the Association for Professionals in Infection Control and Epidemiology (APIC) guidelines to derive their written policies and procedures.

Figure 8: Protocols Included in Infection Prevention Policies and Procedures (N= 62)

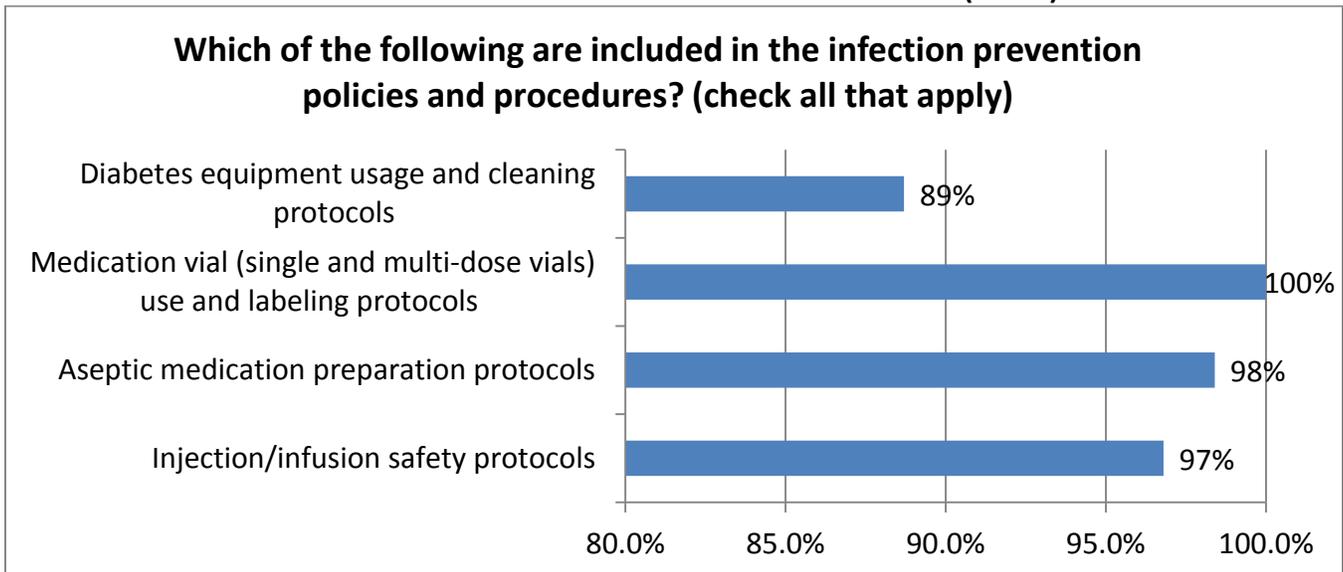


Figure 8 illustrates the types of protocols facilities include in their infection control policies and procedures. All facilities had policies and procedures regarding medication vial use and labeling protocols. Nearly all (97%) included injection and/or infusion safety protocols in their infection prevention policies and had policies/procedures on aseptic medication preparation (98%). Fewer facilities, 89%, had diabetes equipment usage and cleaning protocols included in their infection prevention policies and procedures. This suggests that

ASC administrators might benefit from education on the importance of including assisted blood glucose protocols in their facility's infection control policies and procedures, if they are providing assisted blood glucose monitoring services.

Figure 9: Injection Safety Statements Included in Infection Prevention Policies and Procedures (N=62)

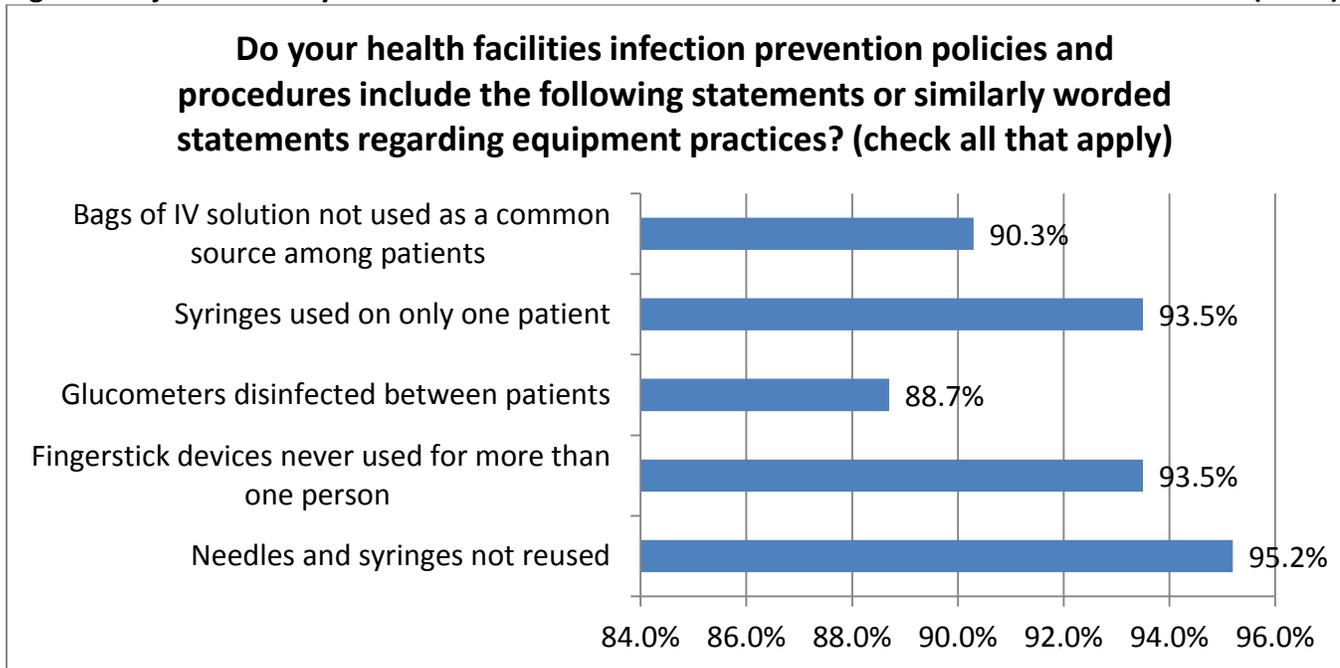
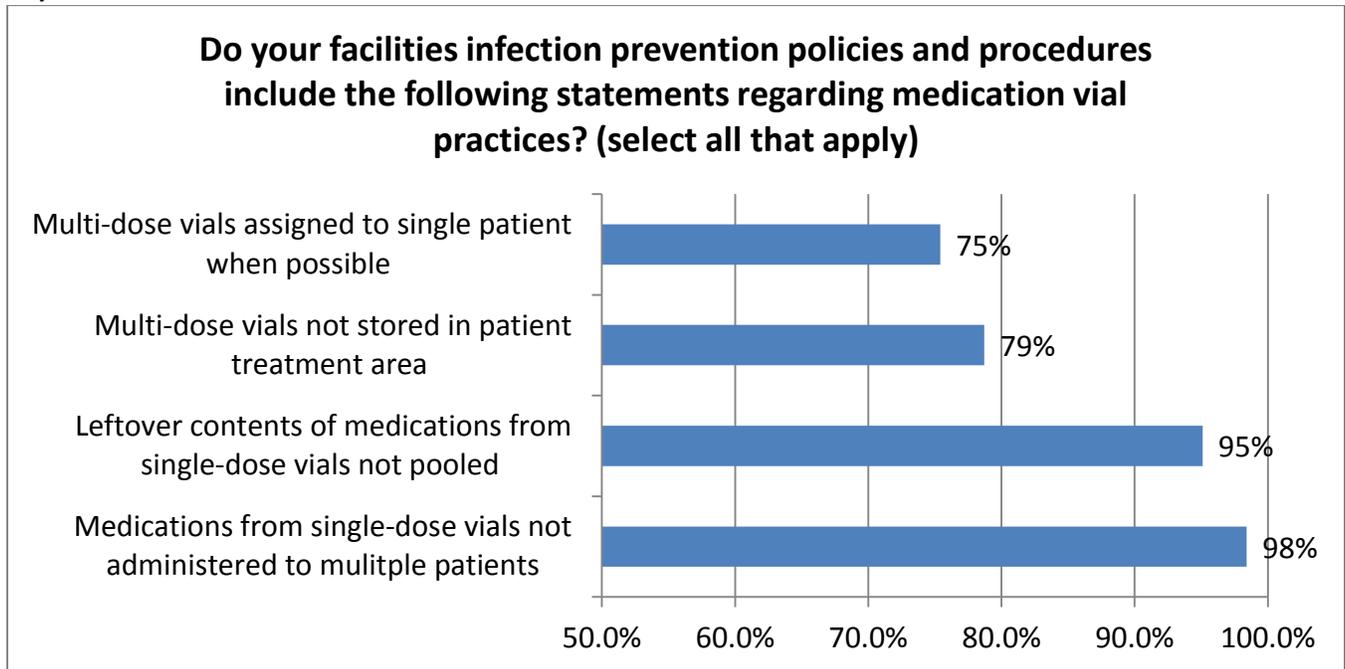


Figure 9 shows the percentage of specific statements regarding safe injection and blood glucose monitoring practices included in surveyed facilities infection prevention written policies and procedures. Only 89% of facilities include the statement 'glucometers are cleaned and disinfected between uses/patients' or a similarly worded statement. This suggests that facilities have fewer protocols for glucometer practices and there may be an increased risk for exposure to bloodborne pathogens when using glucometers as a result. Conversely, some facilities may not perform blood glucose monitoring and therefore do not include statements about glucometer disinfection.

Figure 10: Medication Vial Practice Statements Included in Infection Prevention Policies and Procedures (N=61)



Similar to Figure 9, #10 shows the percentage of specific statements regarding medication vial use included in surveyed facilities infection prevention written policies and procedures. Nearly all facilities have policies that address use of single-dose medication vials, but significantly fewer facilities have policies that address use of multi-dose vials of medications.

Infection Control Policies: Staff Monitoring and Training

The majority (84%) of surveyed facilities indicated that they 'have a policy or protocol encouraging and/or requiring healthcare personnel to report or intervene if they notice a lapse in injection safety being performed by a co-worker', and have 'policies, procedures, or safety measures in place to track Healthcare Personnel access to controlled substances to prevent narcotics theft and/or diversion' (95%). (2% indicated that this question was not applicable because they did not have narcotics in their facility). Most facilities (95%) indicated that they 'document non-compliance with infection prevention policies and procedures.' These findings suggest that not only do ambulatory surgery centers have infection control policies in place that address medication handling and administration, but they also encourage and monitor HCWs compliance with infection control procedures. These types of policies help to reduce the risk that patients are exposed to bloodborne pathogens through injection practices by holding HCWs accountable and limiting HCWs access to controlled substances.

Figure 11: Healthcare Personnel Required Trainings (N=62)



All facilities required their healthcare personnel to complete formal job-specific training on general infection control and equipment usage and cleaning. However, only 81% require formal job specific training on injection or infusion safety (Figure 11). Healthcare facilities offered both computer-based and in-person trainings, with the latter being the most common at 90%.

Injection Safety Knowledge and Practices

Note:

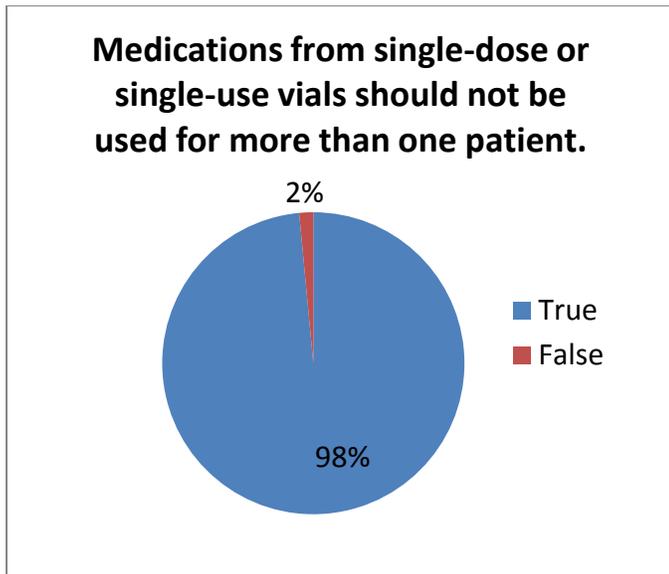
Please interpret results with caution. In some cases, small sample sizes may account for large discrepancies in the data. Interpretations between groups may be problematic due to large variations in sample size. Responses from groups with a small sample size are likely to have greater variation and are less likely to be representative of the population. For example, only 8 physicians completed the survey compared to 237 nurses (See Facility and HCW characteristics in the section above).

Ninety-one percent of surveyed HCWs prepare or administer injectable medications. All HCWs who prepare or administer injectable medications indicated that the statement ‘syringes can be used to give an injection to more than one patient as long as the needle is replaced with a clean needle’ is false. All HCWs also indicated that they ‘Never’ use the same syringe to give injections to more than one patient. This suggests that HCWs within ASCs are aware that a new needle and syringe must be used for each injection.

Single Dose Medication Vials

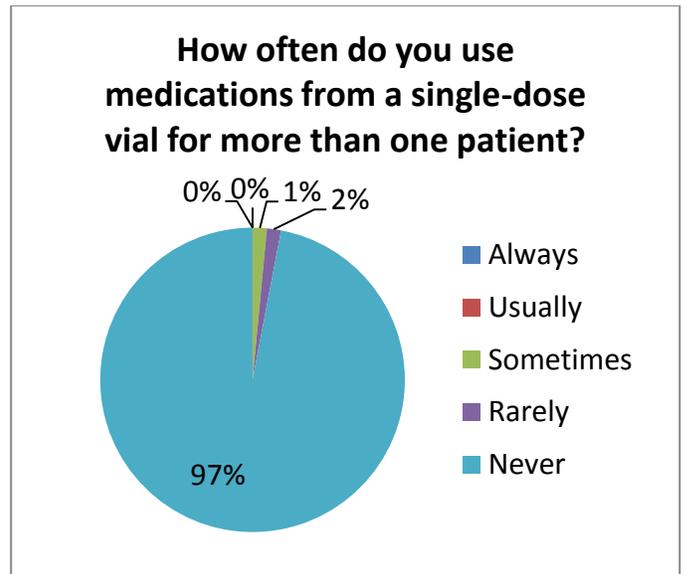
Healthcare Worker Knowledge:

Figure 13: Single-Dose Vial Use (N=261)



Healthcare Worker Practice:

Figure 14: Single-Dose Vial Use (N=261)



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 solutions.”

Figure 15: Comparison of Single-Dose Vial Use Knowledge by Experience, Degree and Profession

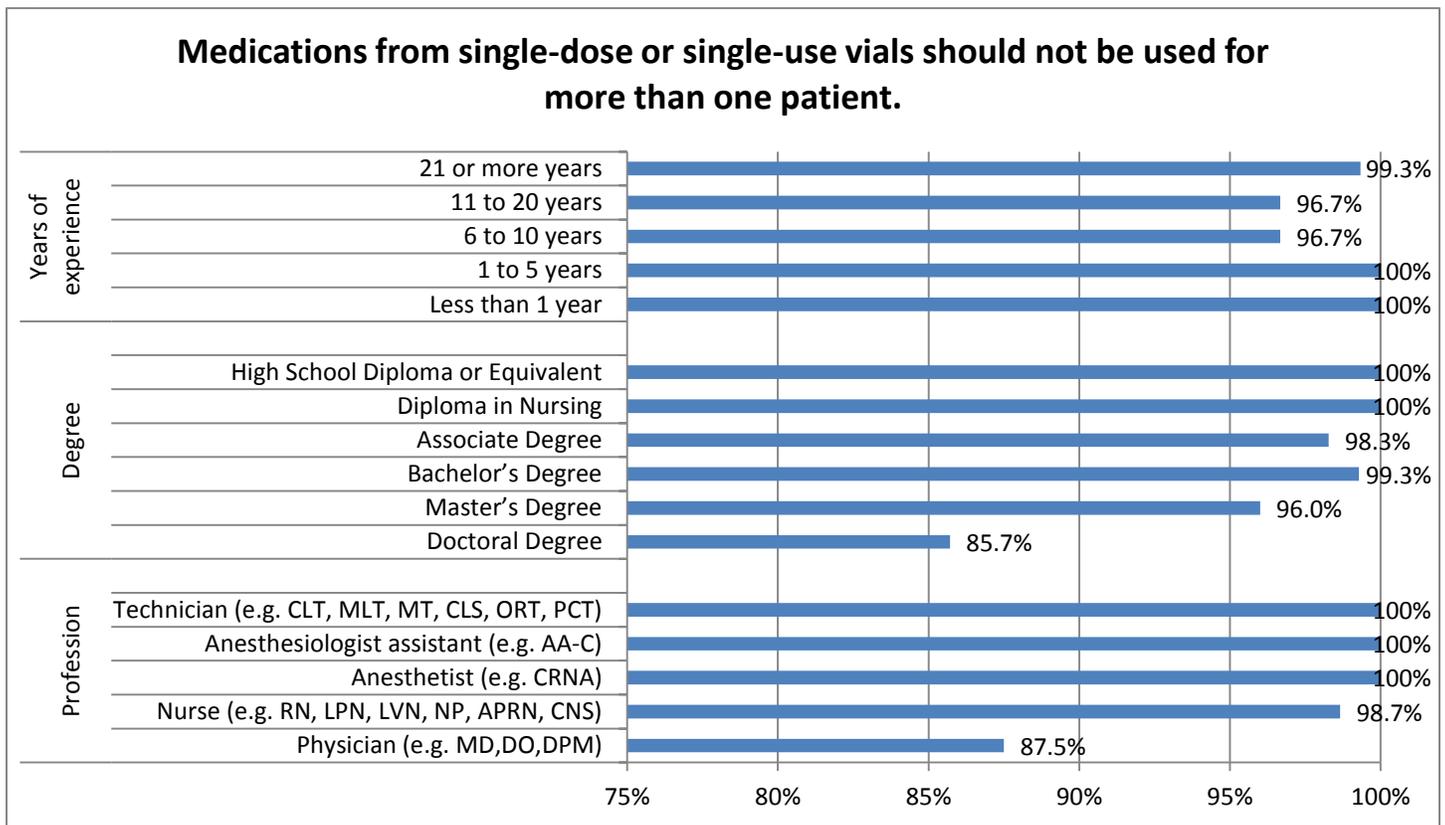
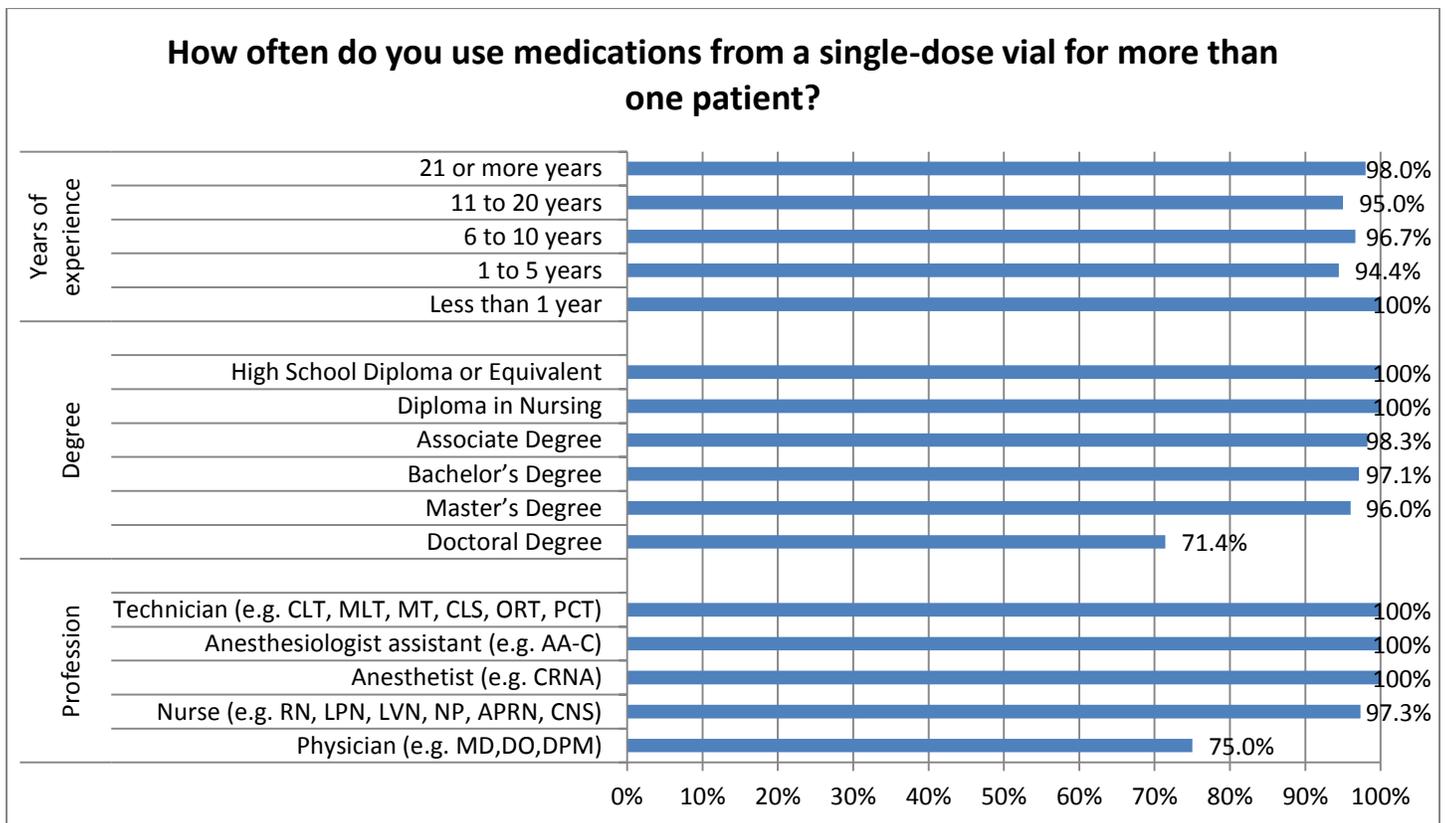


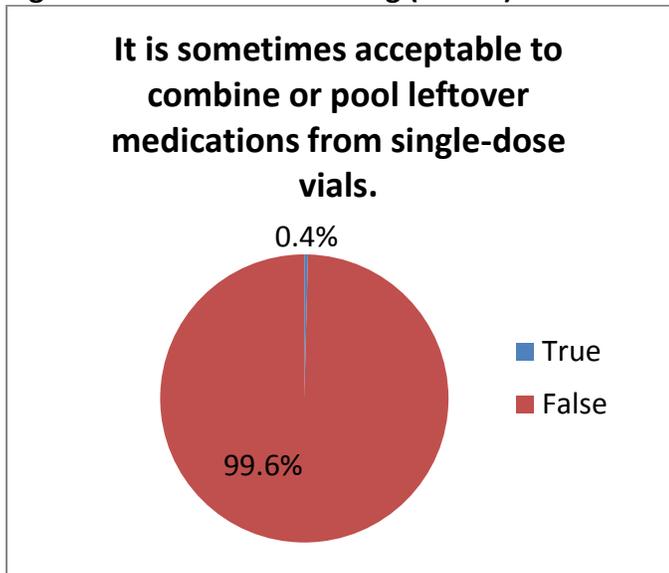
Figure 16: Comparison of Single-Dose Vial Use Practice by Experience, Degree and Profession



The majority (98%) of HCWs indicated that single-dose vials should not be used for more than one patient (Figure 13). However, Figure 14 shows that 1% 'sometimes' and 2% 'rarely' used medications from a single-dose vial for more than one patient. Figure 15 breaks the responses down by profession, education, and years of experience. Of note, participants with less than 1 year of experience reported greater knowledge of the CDC's single-dose vial practice recommendations than more veteran healthcare workers. Perhaps counterintuitively, healthcare workers with lower levels of education were more likely to be familiar with the CDC's recommendations than those with more advanced degrees. Figure 16 provides a more detailed look at single dose vial use behavior among healthcare workers broken down by profession, years of experience, and professional degree. We note that behavior largely reflected healthcare worker knowledge.

Healthcare Worker Knowledge:

Figure 17: Medication Pooling (N=259)



Healthcare Worker Practice:

Figure 18: Medication Pooling (N=261)

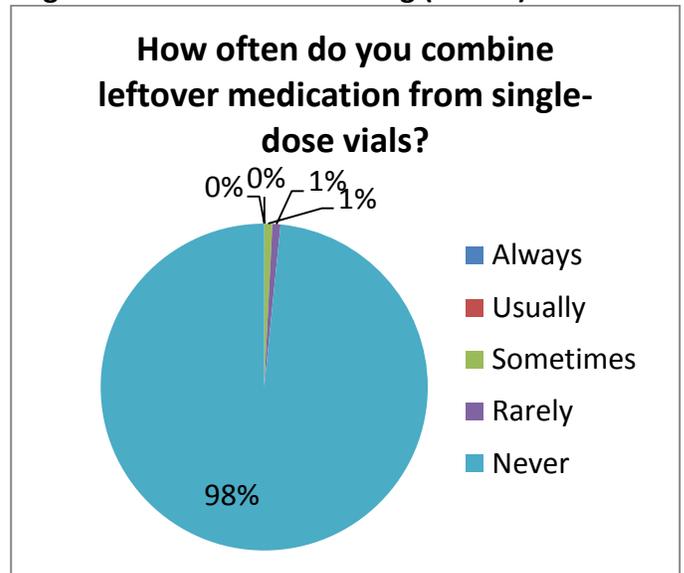


Figure 19: Medication Pooling Knowledge by Experience, Degree and Profession

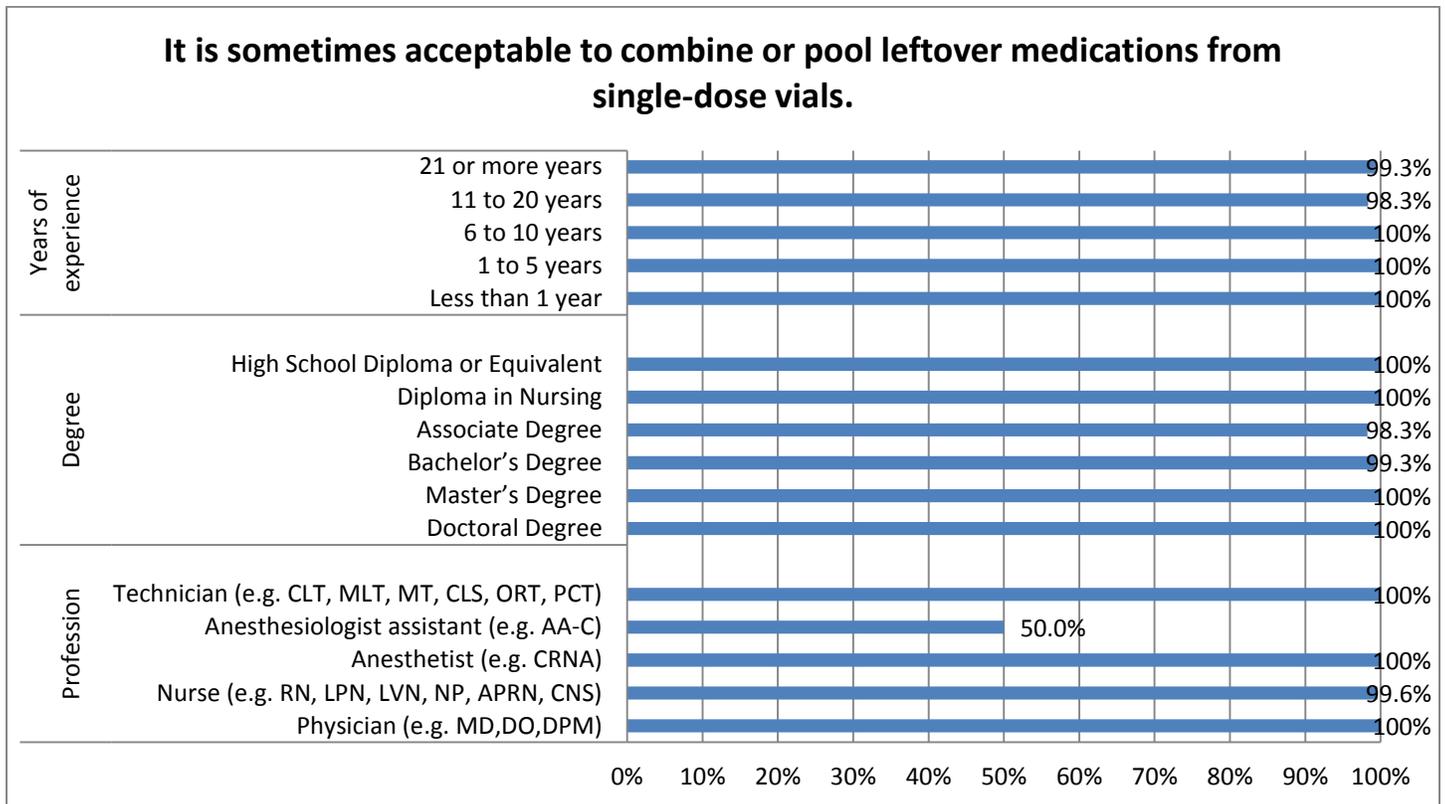
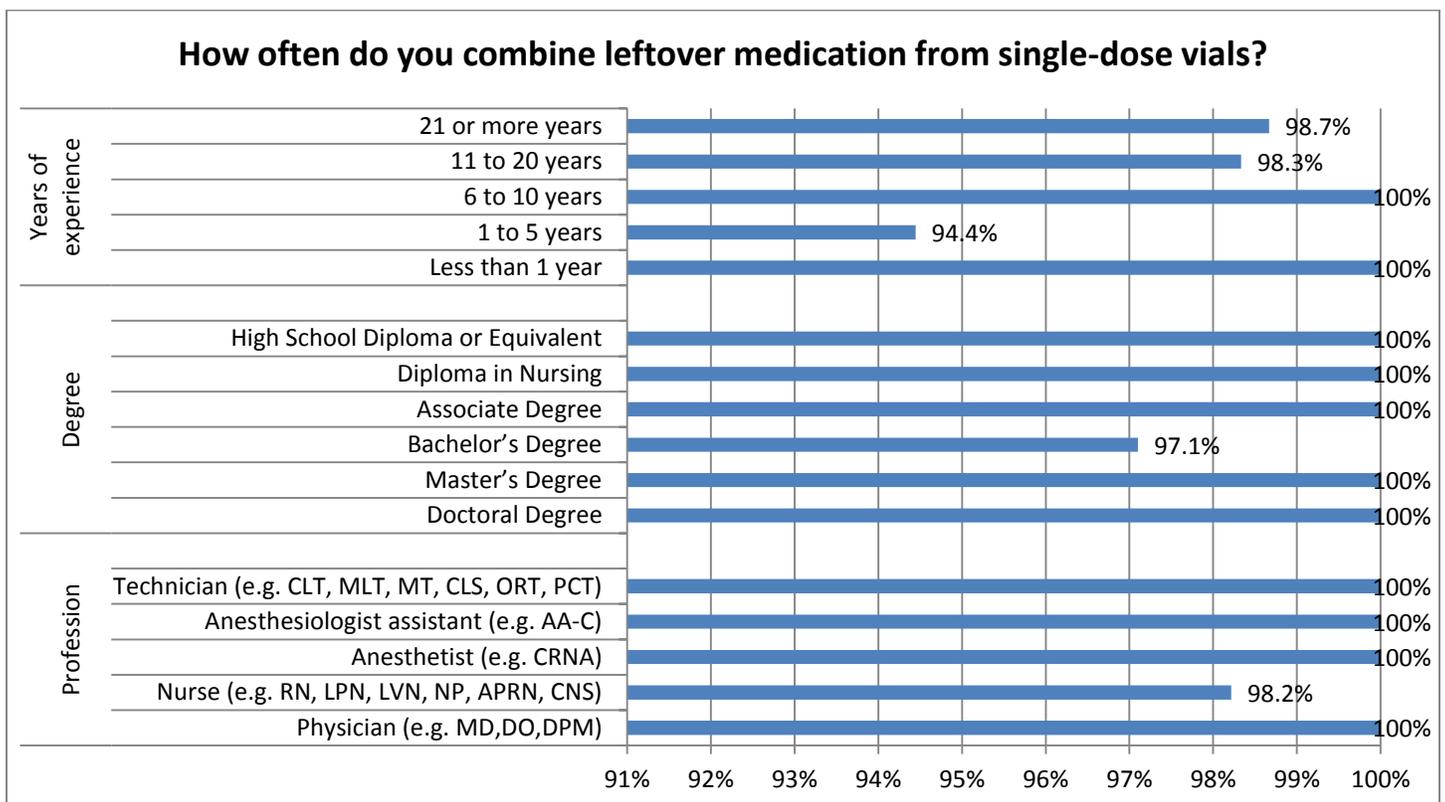


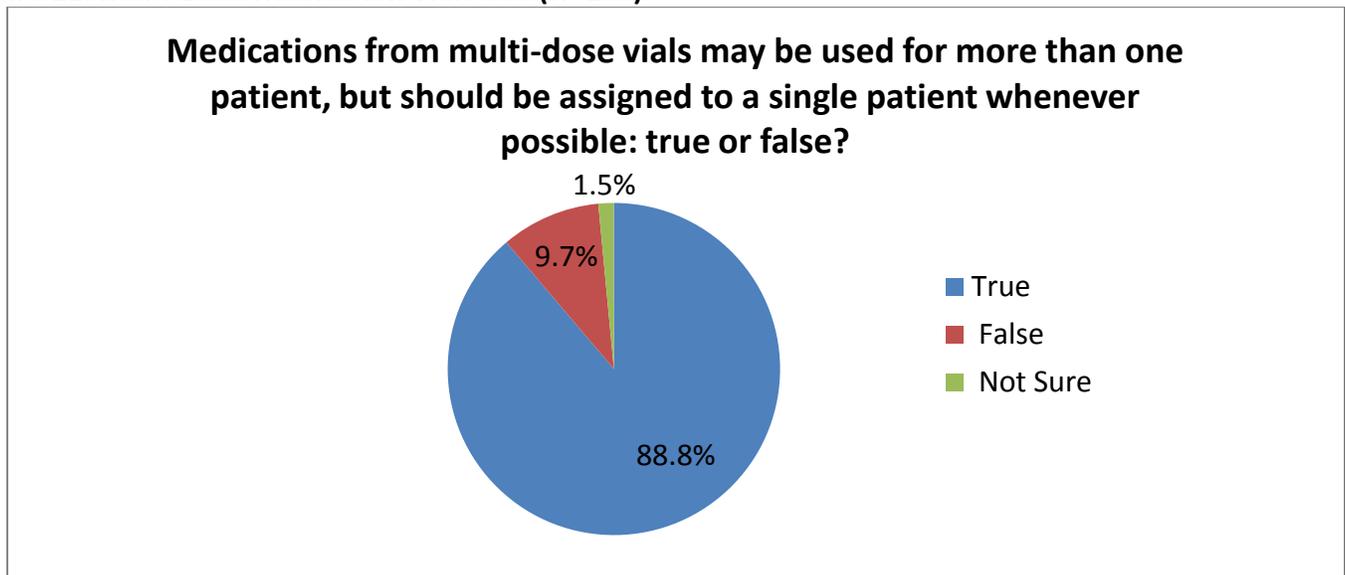
Figure 20: Medication Pooling Practice by Experience, Degree and Profession



Nearly all (99.6%) of HCWs indicated that it is not acceptable to combine or pool leftover medications from single-dose vials (Figure 17). However, 2% indicated that they have combined leftover medication from single-dose vials (Figure 18). This suggests that there is a divergence in knowledge and practice associated with combining leftover contents from single-dose medication vials. Figure 19 shows a more detailed look at the responses in regard to medication pooling. Data for Anesthesiologist assistants should be interpreted with caution due the small number of AAs participating in the survey. Figure 20 shows a more detailed look at the response data regarding medication pooling practice; the percentages shown represent participants who indicated that they never pooled medications. If we compare figures 19 and 20 we see that there is a discrepancy between medication pooling knowledge and practice. It appears that participants are aware that medication pooling is not acceptable however; they have and/or continue to pool medications. Pooling of medications is sometimes seen as a way to minimize cost, by avoiding the waste of half-used vials of medication. However, this practice can put patients at risk of bacterial and viral pathogens and is expressly discouraged under CDC guidelines.

Multi-Dose Medication Vials

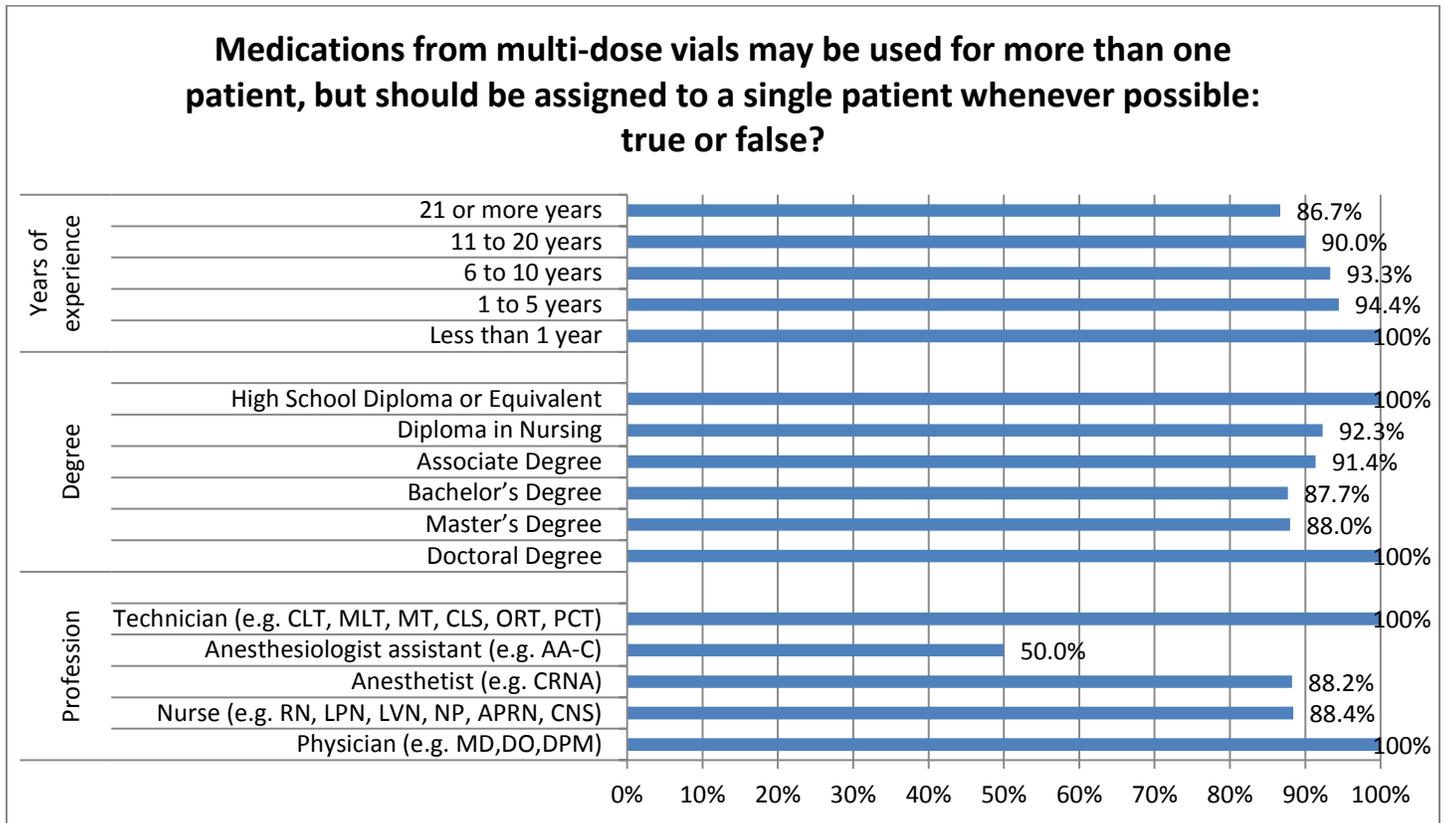
Figure 21: Multi-Dose Medication Vials Use (N=259)



CDC Recommendation:

“Multi-dose vials should be dedicated to a single patient whenever possible. If multi-dose vials must be used for more than one patient, they should not be kept or accessed in the immediate patient treatment area.”

Figure 22: Multi-Dose Medication Vials Use by Experience, Degree and Profession



CDC recommendations state that multi-dose medication vials should be assigned to a single patient whenever possible. Nearly 10% of HCWs indicated that the statement ‘Medications from multi-dose vials may be used for more than one patient, but should be assigned to a single patient whenever possible’ was false. An additional 1.5% of HCWs were not sure if the statement was true or false. Respondents answering ‘False’ may be under the assumption that multi-dose vials should always be dedicated to a single patient. This is an accepted practice, but goes above and beyond the CDC guidelines.

Figure 23: Needle and Syringe Reuse with Multi-Dose Medication Vials (N= 261)

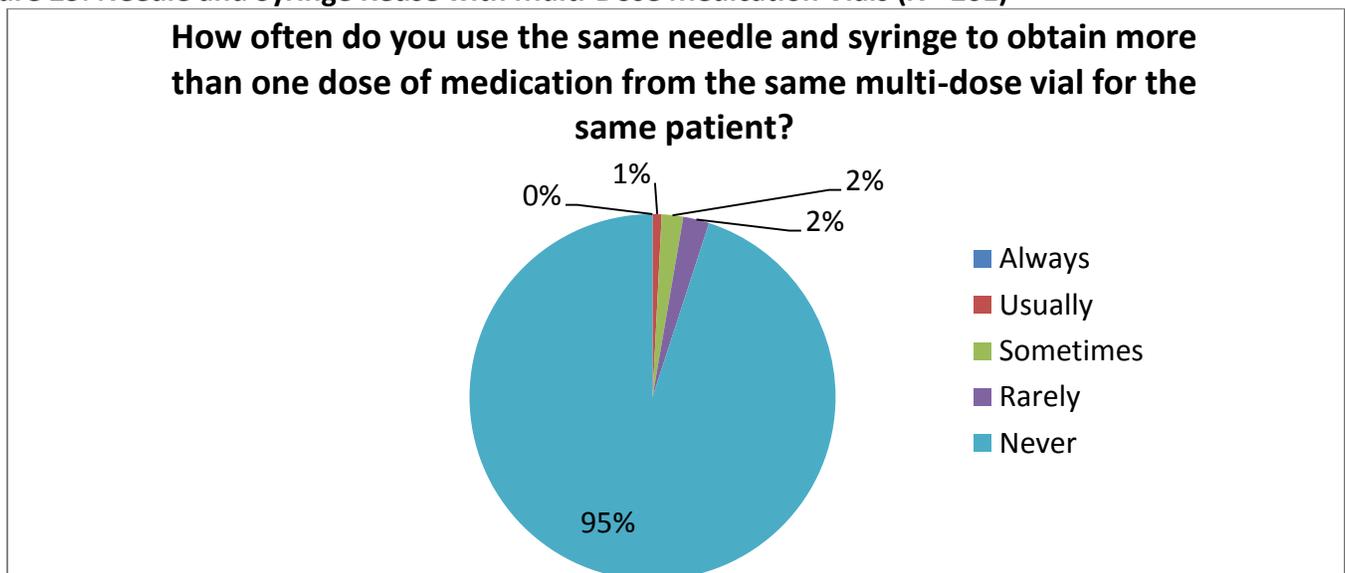
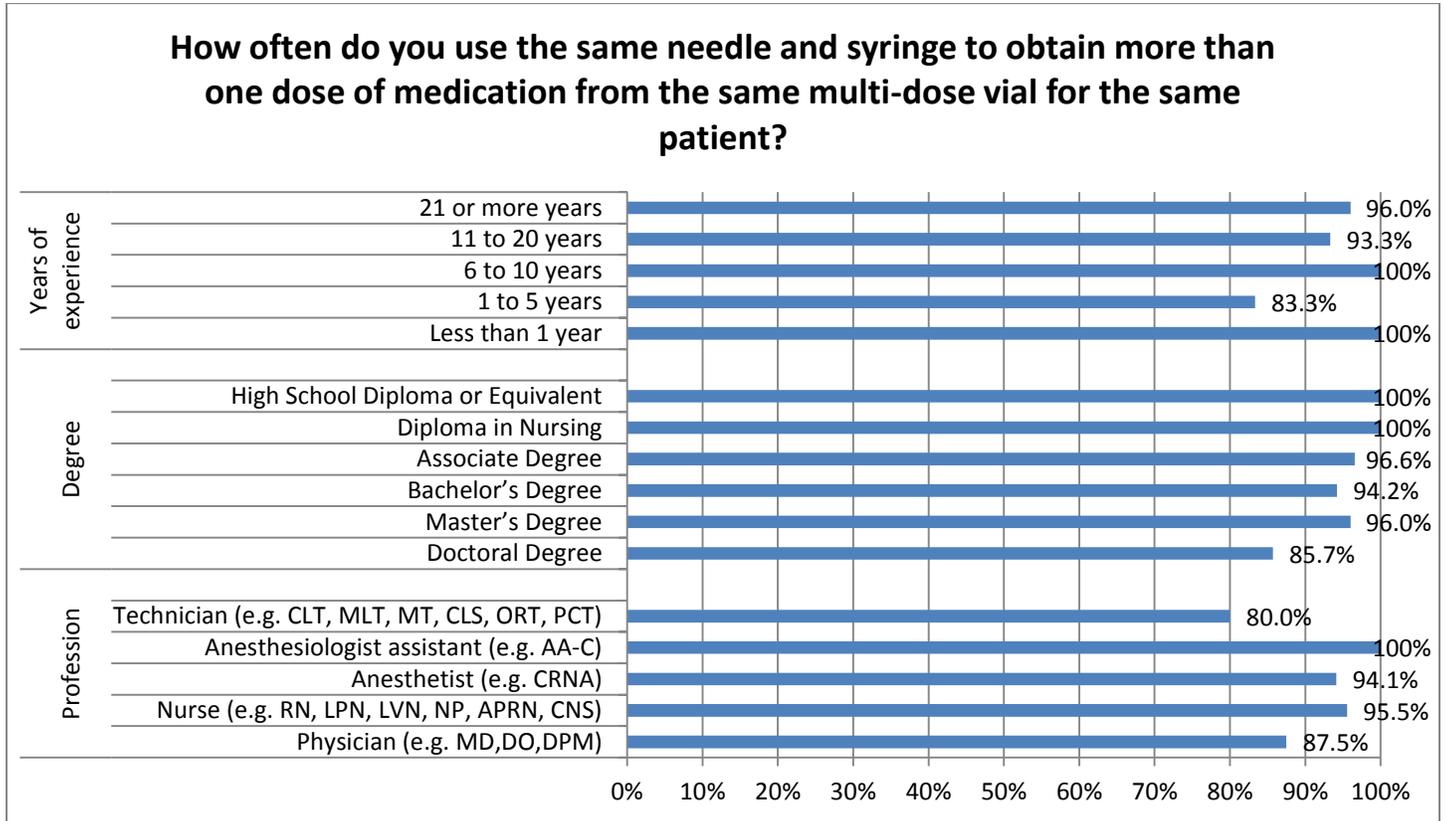


Figure 24: Needle and Syringe Reuse with Multi-Dose Medication Vials by Experience, Degree and Profession



The majority (95%) of HCWs ‘Never’ use the same needle and syringe to re-enter a multi-dose medication vial to obtain additional doses of medication for the same patient. However, a combined 5% indicated that they ‘Usually’, ‘Sometimes’, or ‘Rarely’ use the same needle and syringe to obtain more than one dose of medication from the same multi-dose vial for the same patient. According to CDC recommendation needles and syringes should not be used more than one time. Using the same needle and syringe to obtain more than one dose of medication from a multi-dose medication vial for the same patient increases the risk of healthcare associated outbreaks of bloodborne pathogens such as hepatitis C. The numbers shown in Figure 24 represent the percentage of participants that indicated they never reuse needles or syringes to access a multi-dose vial broken down by individual characteristics. This data shows that, again, individuals with a lower professional degree seem to follow CDC recommendations closer than those with higher degrees. We also see that physicians and those with doctorate degrees lag behind their healthcare worker counterparts in terms of familiarity and practice of CDC injection safety guidelines.

Figure 25: Multi-Dose Vials and Patient Treatment Area Storage (N=258)

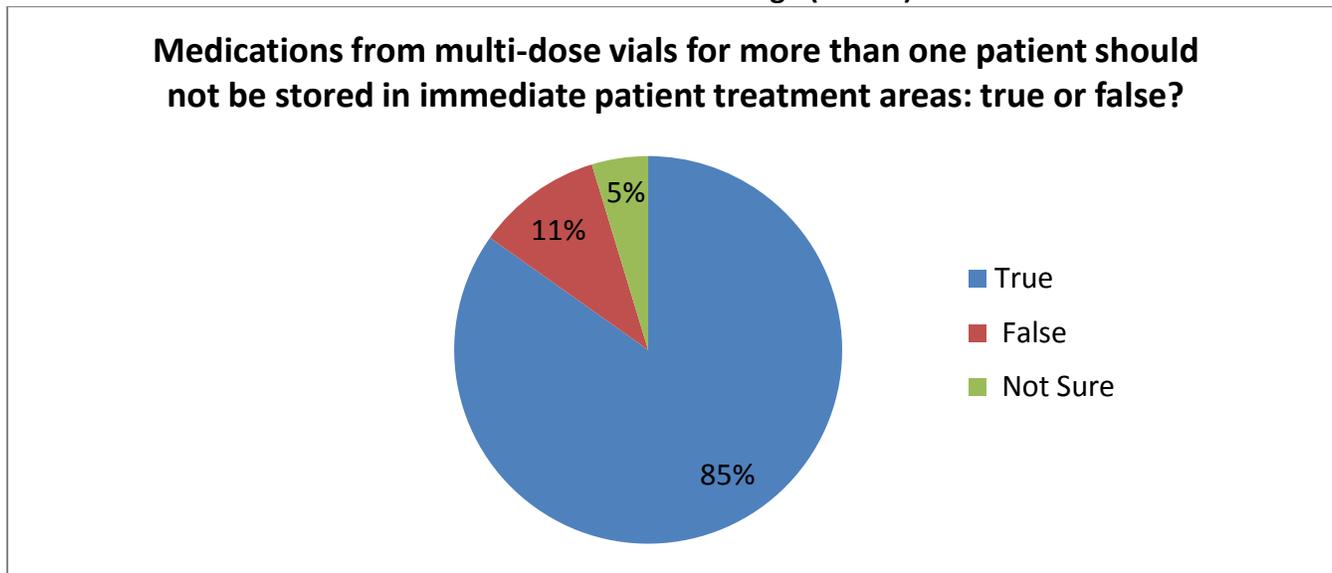
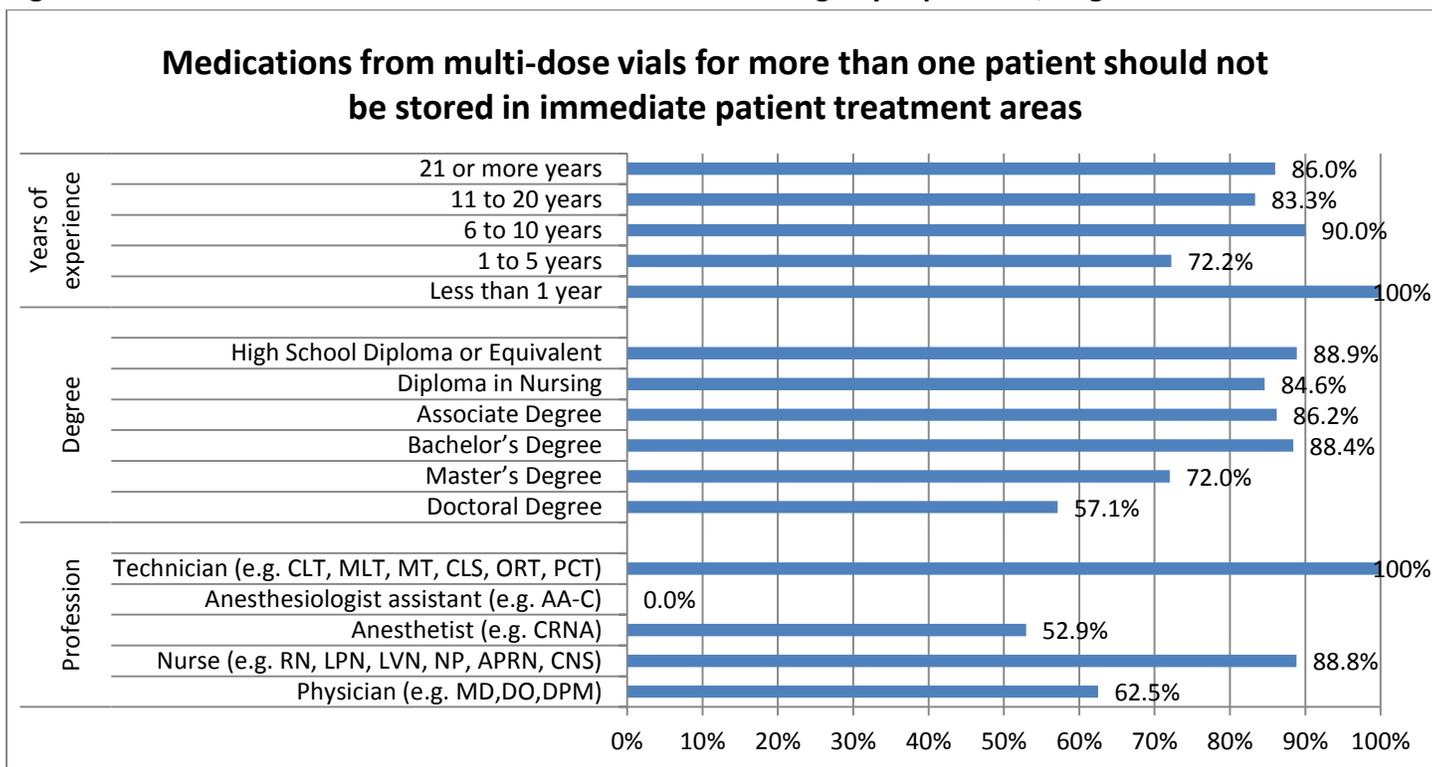


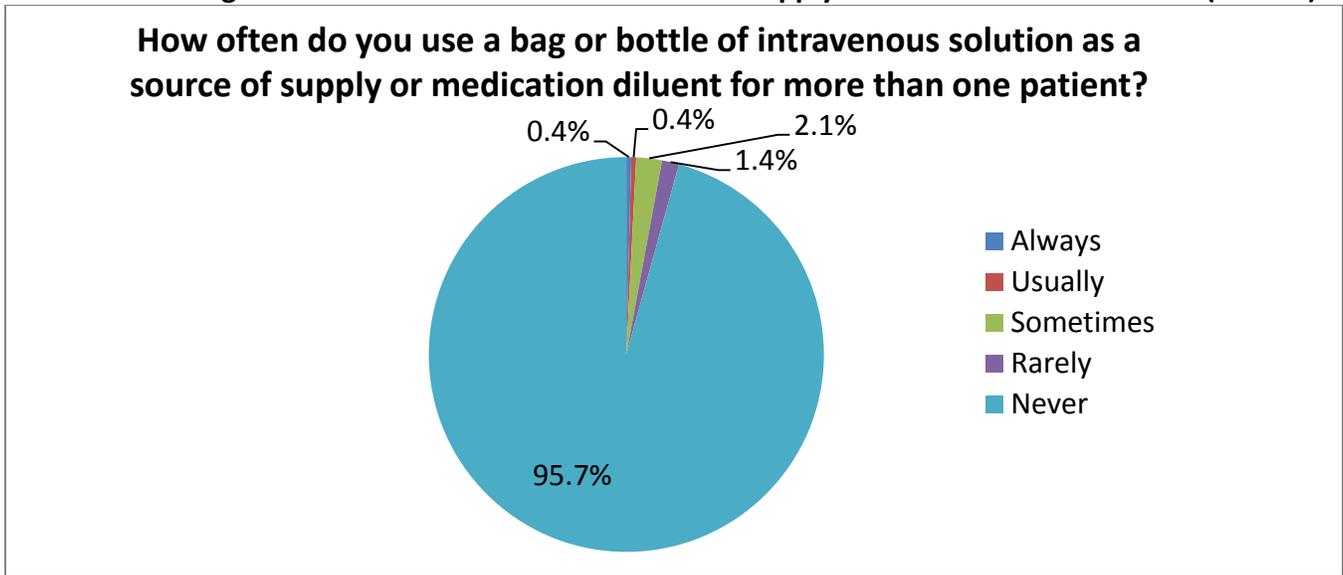
Figure 26: Multi-Dose Vials and Patient Treatment Area Storage by Experience, Degree and Profession



The majority (85%) of HCWs indicated that the statement ‘medications from multi-dose vials for more than one patient should not be stored in immediate patient treatment areas’ is true. Eleven percent indicated that the statement was false. CDC recommends that multi-dose medication vials for multiple patient use be stored outside of immediate patient treatment areas. Storing multi-dose vials outside of immediate patient treatment areas reduces the likelihood that the vial will be accessed more than once using the same (or a used) needle and syringe. The responses shown in Figures 23, 24, 25 and 26 suggest that there is a need for more education pertaining to recommendations for multi-dose medication vial storage and use.

Infusions

Figure 27: Use of Bags or Bottles of Intravenous Solution as Supply for More Than One Patient (N= 282)

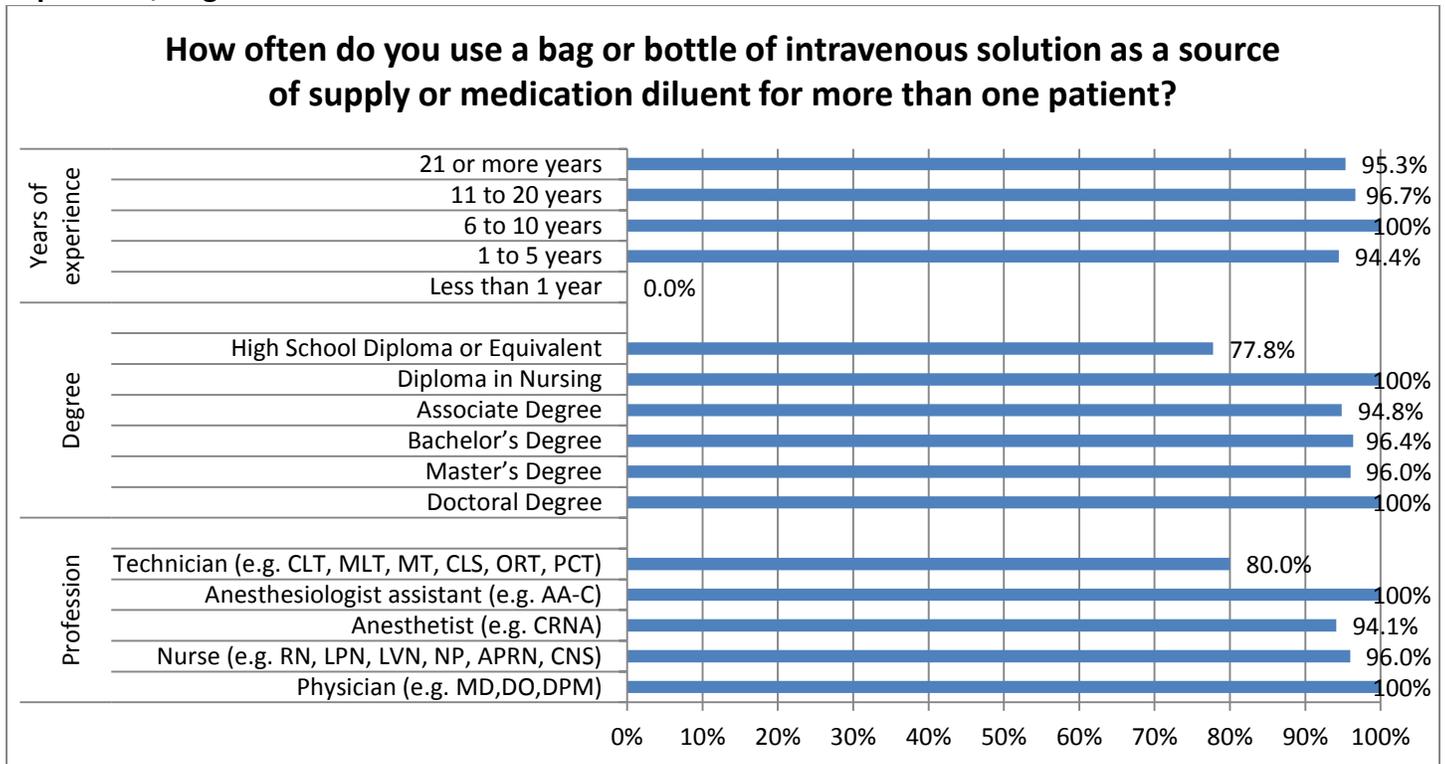


CDC Recommendation:

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

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

Figure 28: Use of Bags or Bottles of Intravenous Solution as Supply for More Than One Patient by Experience, Degree and Profession



The majority (95.7%) of HCWs ‘Never’ use a bag or bottle of intravenous solution as a source of supply for more than one patient (Figure 27). Figure 28 shows a more detailed look at the respondents who never reported use of a bag of intravenous solution as a medication source for more than one patient. We see that smaller percentages of Technicians, participants with less experience, and high school diplomas indicated that they ‘never’ used intravenous solutions as a source of supply for more than one patient. CDC recommends that bags or bottles of intravenous solution not be used as a common source of supply for more than one patient.

Figure 29: Notifying Colleagues of Injection Safety Lapses (N= 282)

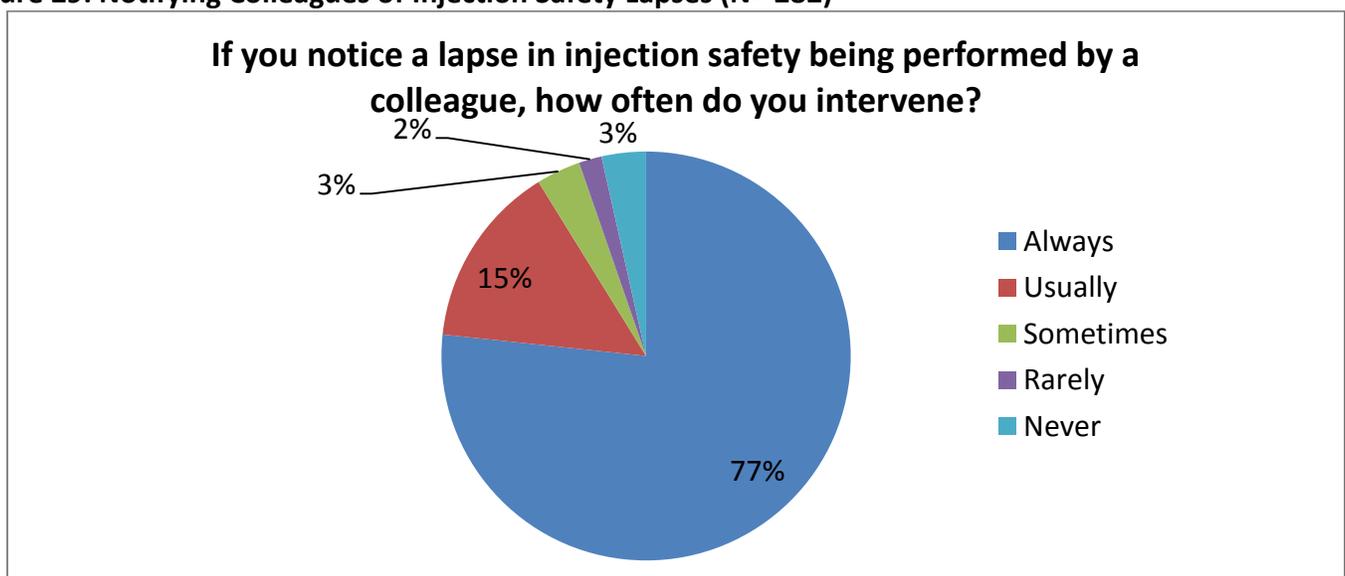
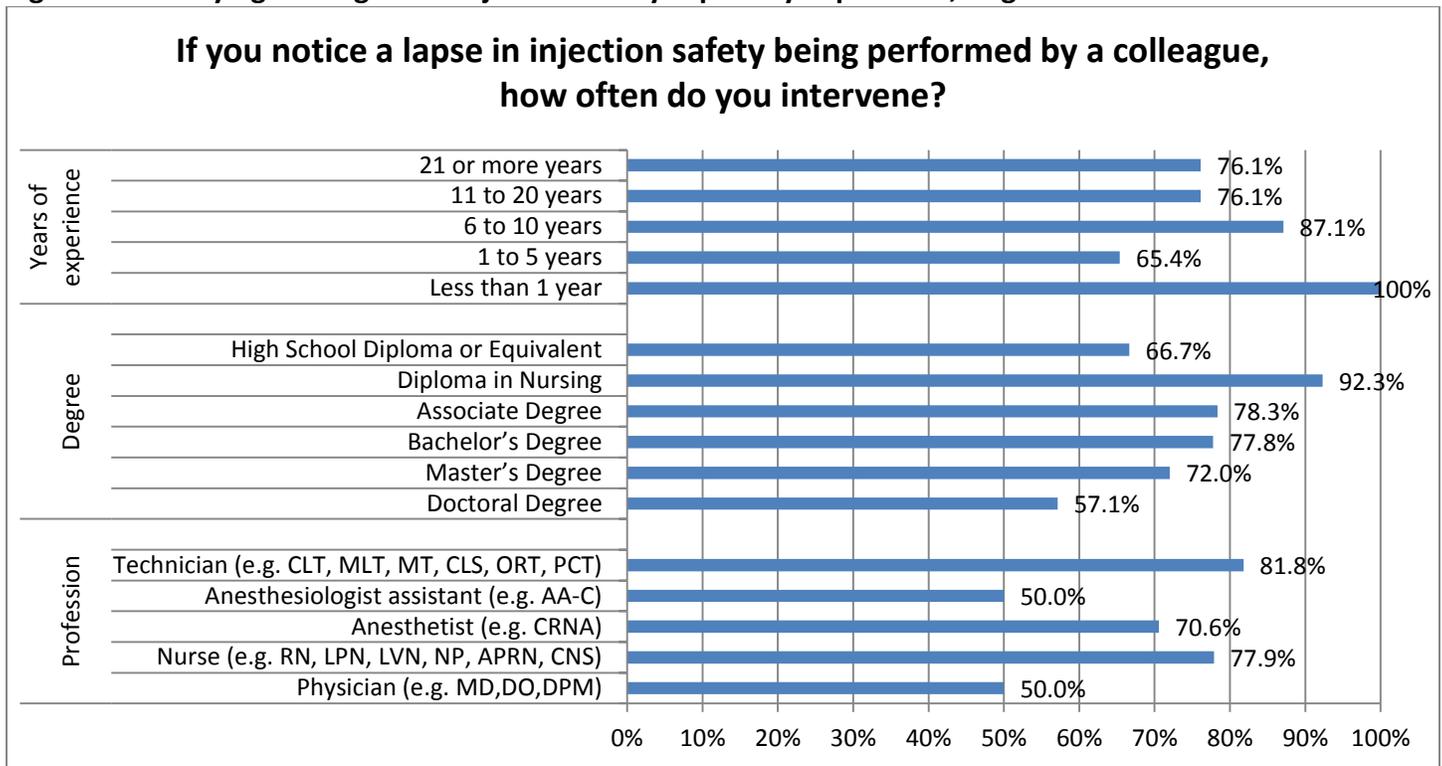


Figure 30: Notifying Colleagues of Injection Safety Lapses by Experience, Degree and Profession



The majority (77%) of HCWs reported that they ‘Always’ intervene if they notice a lapse of injection safety being performed by a colleague (Figure 29). The range of other responses suggests that there are a variety of situations in which a HCW would not intervene if they witnessed a lapse in injection safety by a colleague. Figure 30 shows a more detailed look at the ‘always’ responses regarding intervening when a colleague has a lapse in injection safety performance. The patient’s safety should be everyone’s number one concern. It is up to clinicians and facility administrators to promote and encourage a culture of safety in an environment of patient-centered care. Regardless of profession, healthcare workers and non-clinical staff should feel comfortable alerting individuals of lapses in infection control procedures.

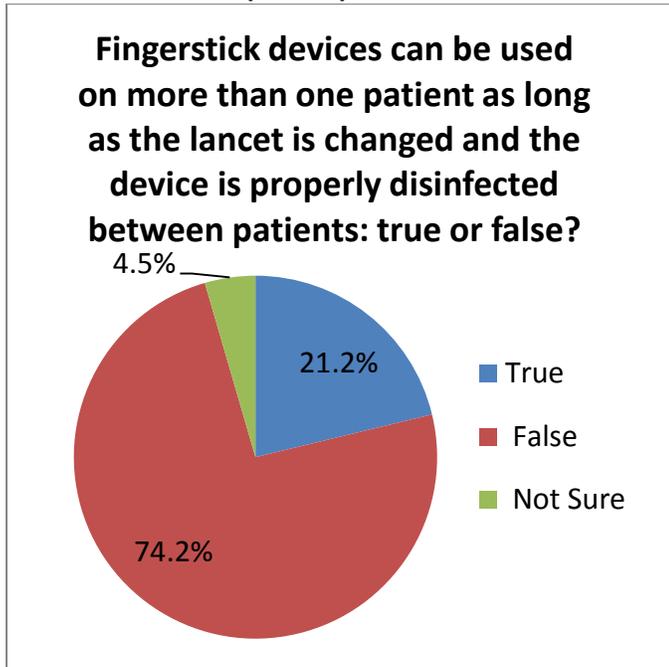
Assisted Blood Glucose Monitoring Knowledge and Practice

93% of HCWs indicated that they utilize diabetes management devices in their healthcare facility.

Fingerstick Devices

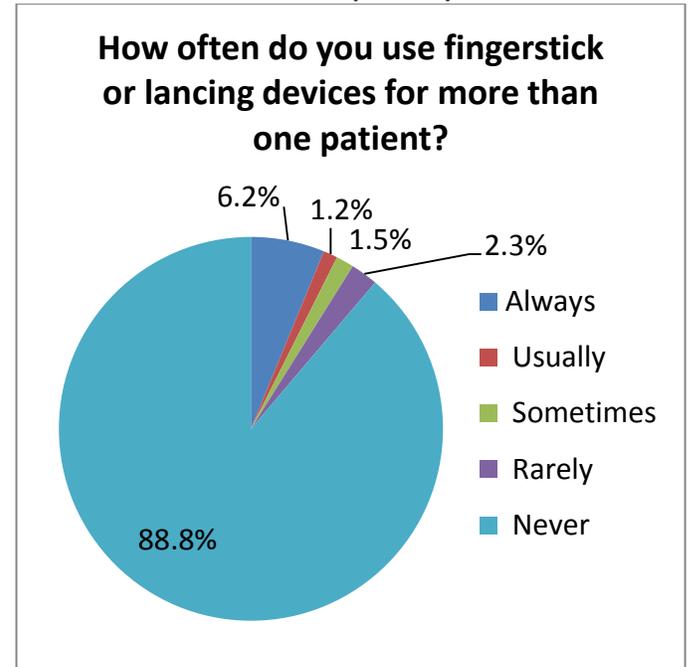
Healthcare Worker Knowledge:

Figure 31: Fingerstick Device Use on More Than One Patient (N=264)



Healthcare Worker Practice:

Figure 32: Frequency of Fingerstick Device Use on More Than One Patient (N=260)



CDC Recommendation:

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

Figure 33: Fingerstick Device Use on More Than One Patient by Experience, Degree and Profession

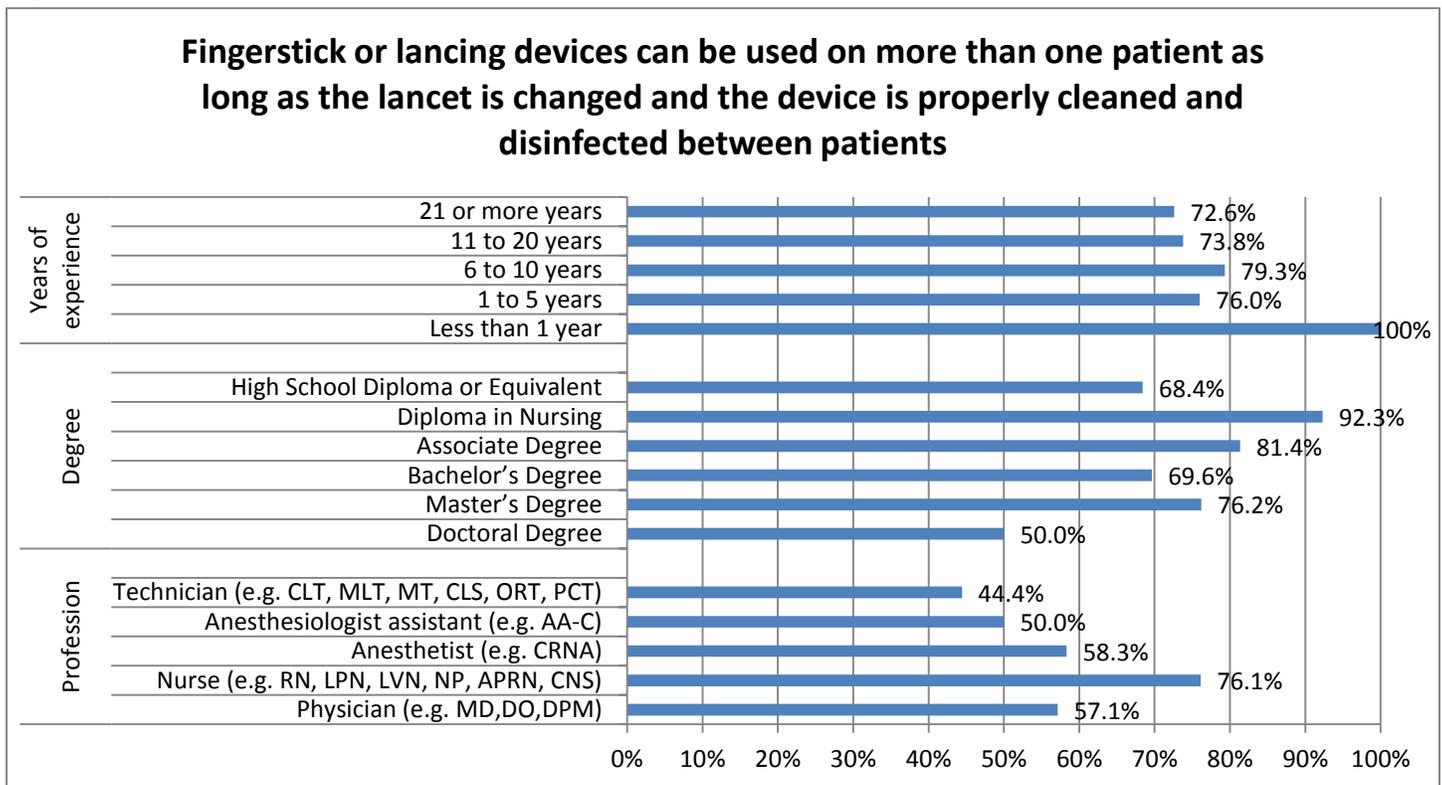
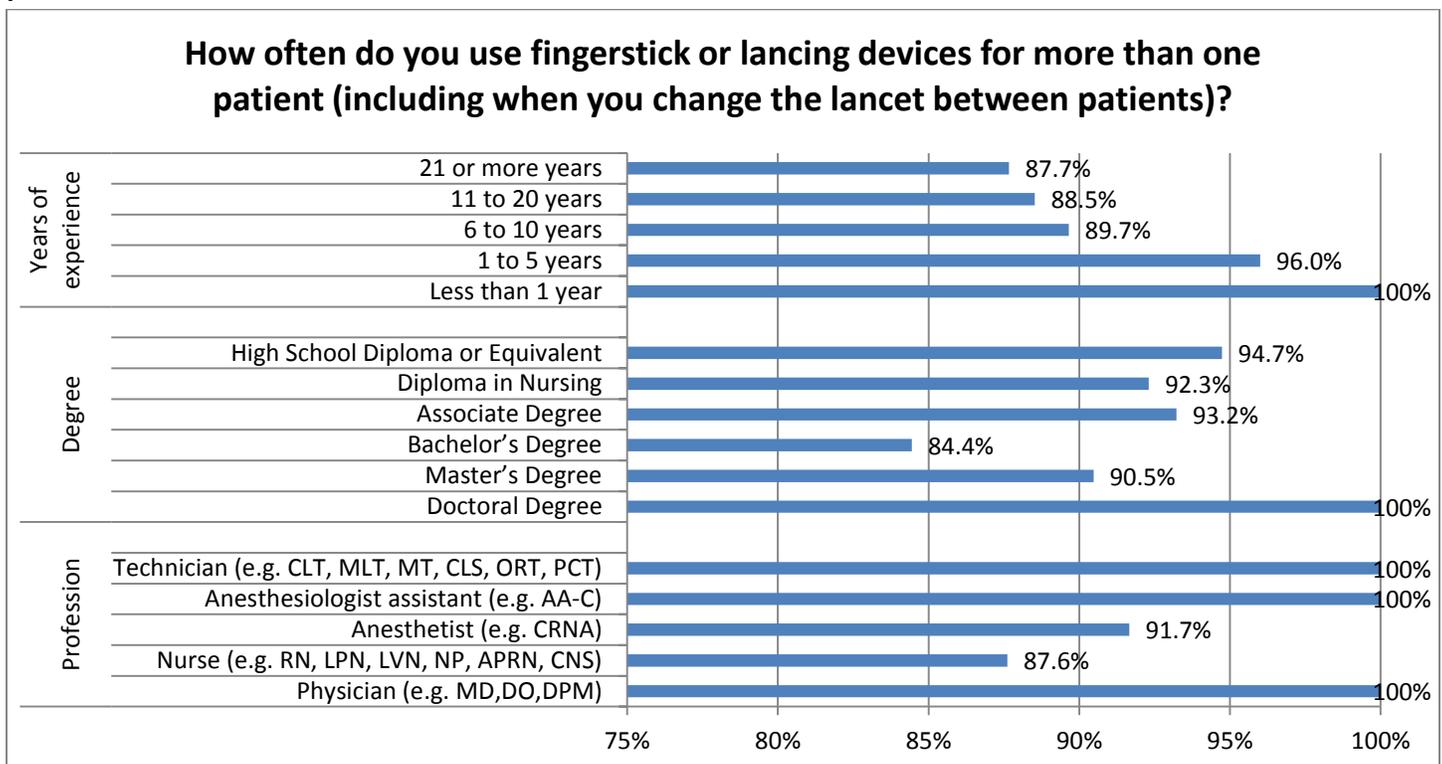


Figure 34: Frequency of Fingerstick Device Use on More Than One Patient by Experience, Degree and profession



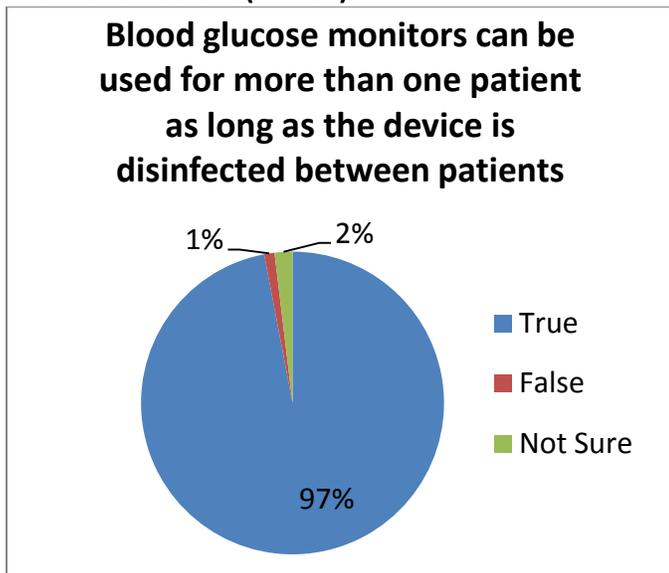
Over 20% of HCWs identified the statement ‘fingerstick devices can be used on more than one patient as long as the lancet is changed and the device is properly disinfected between patients’ as true. An additional 4.5% were not sure if

fingerstick devices can be used on more than one patient (Figure 31). Although the majority (88%) of HCWs indicated that they ‘Never’ use fingerstick devices for multiple patients. An alarming 6% of HCWs indicated that they ‘Always’ use fingerstick devices for more than one patient (Figure 32). Figure 33 shows a more detailed look at the respondents who correctly reported that fingerstick devices cannot be used on more than one patient. Similarly Figure 34 shows a more detailed look at the survey respondents who never use fingerstick use on more than one patient in their practice. In both figure 33 and 34 we see variance in responses in all three comparison groups. HCW familiarity with CDC guidelines in regard to safe use of fingerstick devices was much lower than knowledge of other CDC injection safety guidelines. This suggests that assisted blood glucose monitoring should be a focus of injection safety educational efforts targeted at this population of HCWs. Additional studies are needed to determine if this trend exists outside of HCWs in ASCs (e.g. hospitals, long-term care settings). CDC recommendations state that fingerstick devices should never be used for more than one person.

Blood Glucose Meters

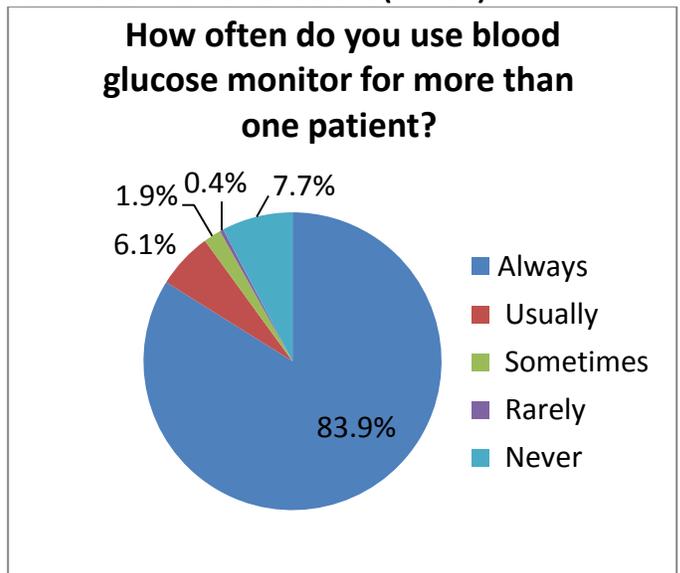
Healthcare Worker Knowledge:

Figure 35: Blood Glucose Monitor Use on More Than One Patient (N=264)



Healthcare Worker Practice:

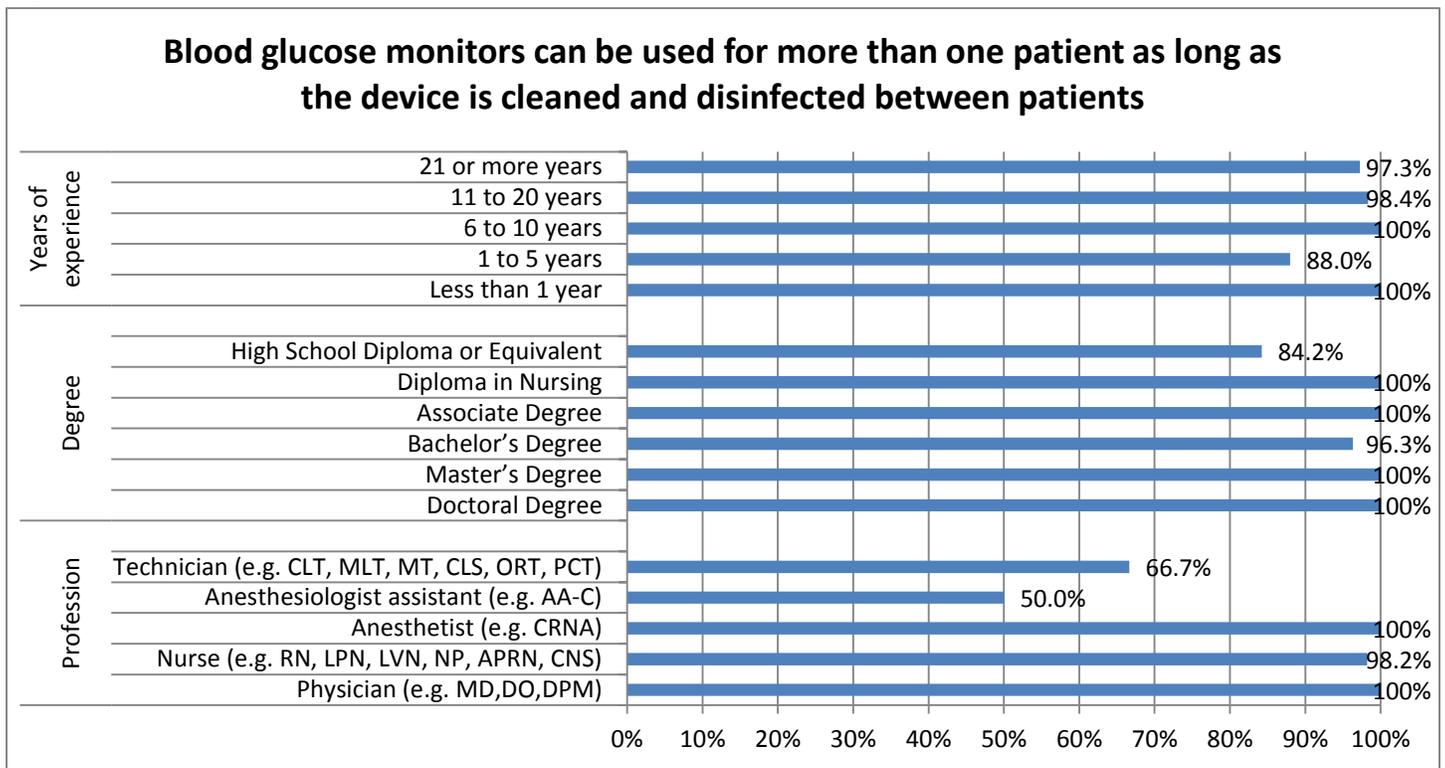
Figure 36: Frequency of Blood Glucose Monitors Use on More Than One Patient (N=261)



CDC Recommendation:

“Whenever possible, blood glucose meters should not be shared. If they must be shared, the device should be cleaned and disinfected after every use, per manufacturer’s instructions. If the manufacturer does not specify how the device should be cleaned and disinfected then it should not be shared.”

Figure 37: Blood Glucose Monitor Use on More Than One Patient by Experience, Degree and Profession

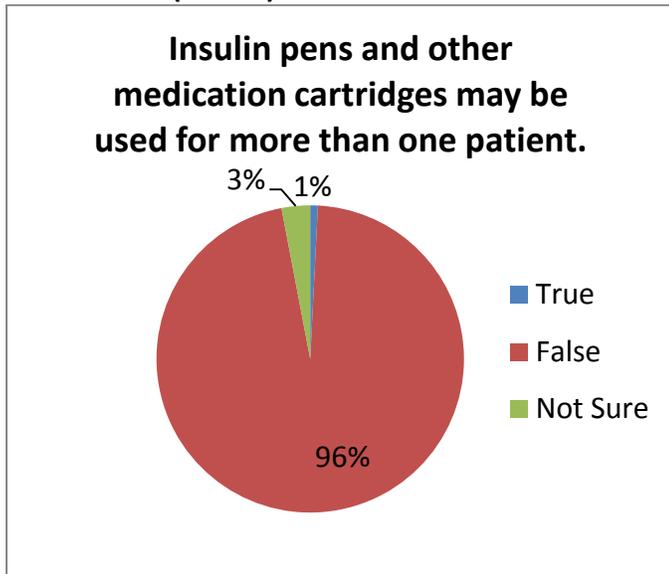


The majority (97%), of HCWs identified the statement ‘blood glucose monitors can be used for more than one patient as long as the device is disinfected between patients’ as true (Figure 35). Nearly 84% of HCWs answered that they ‘Always’ use blood glucose meters for more than one patient (Figure 36). Figure 37 shows a more detailed look at the ‘true’ response data regarding use of blood glucose monitors for more than one patient. CDC recommendations state that whenever possible, blood glucose meters should not be shared. If they must be shared, the device should be cleaned and disinfected after every use, per manufacturer’s instructions. If the manufacturer does not specify how the device should be cleaned and disinfected then it should not be shared.

Insulin Pens

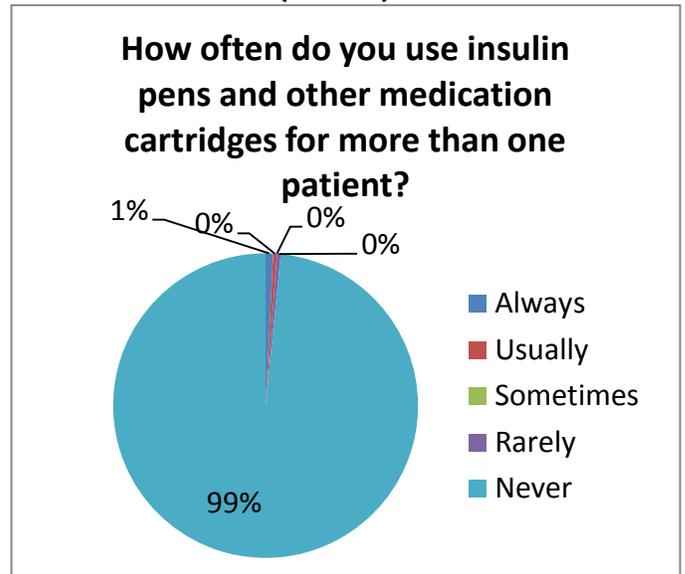
Healthcare Worker Knowledge:

Figure 38: Insulin Pen Use on More Than One Patient (N=263)



Healthcare Worker Practice:

Figure 39: Frequency of Insulin Pen Use on More Than One Patient (N= 260)



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 40: Insulin Pen Use on More than One Patient by Experience, Degree and Profession

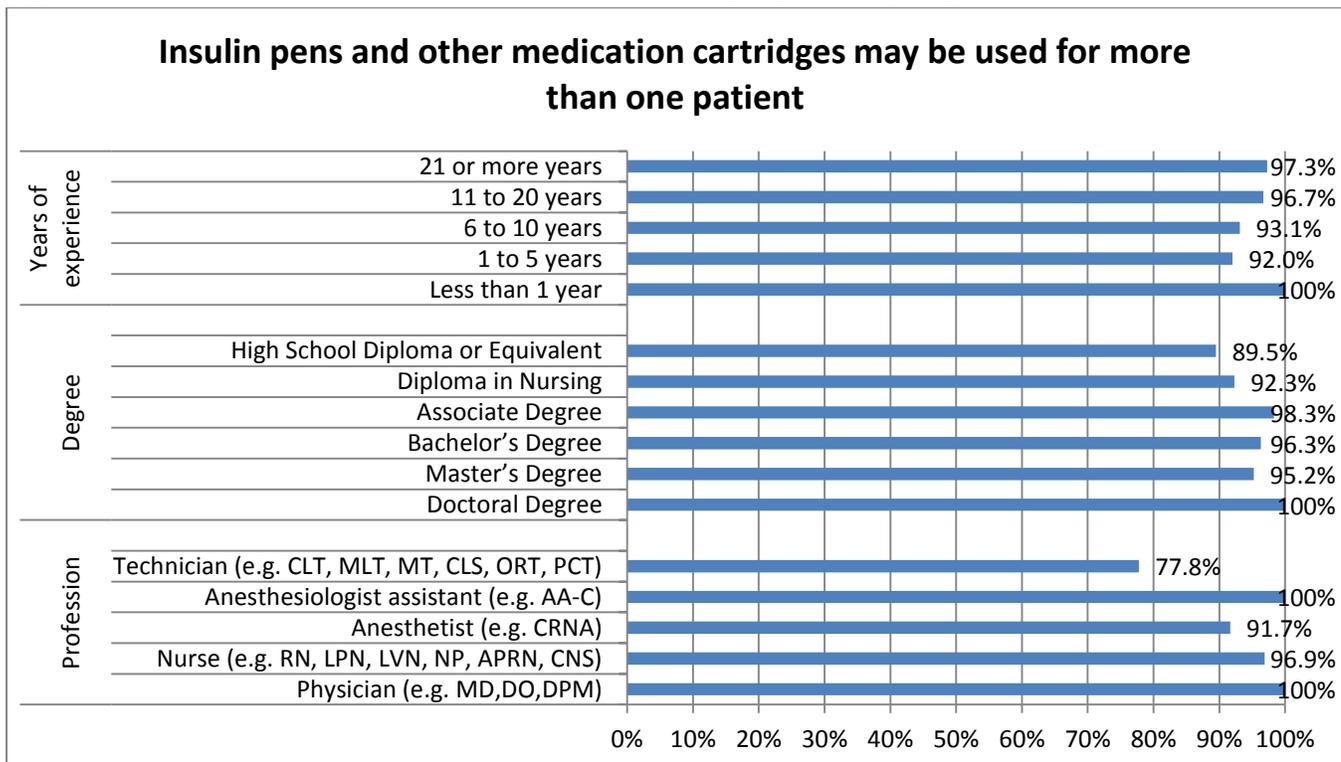
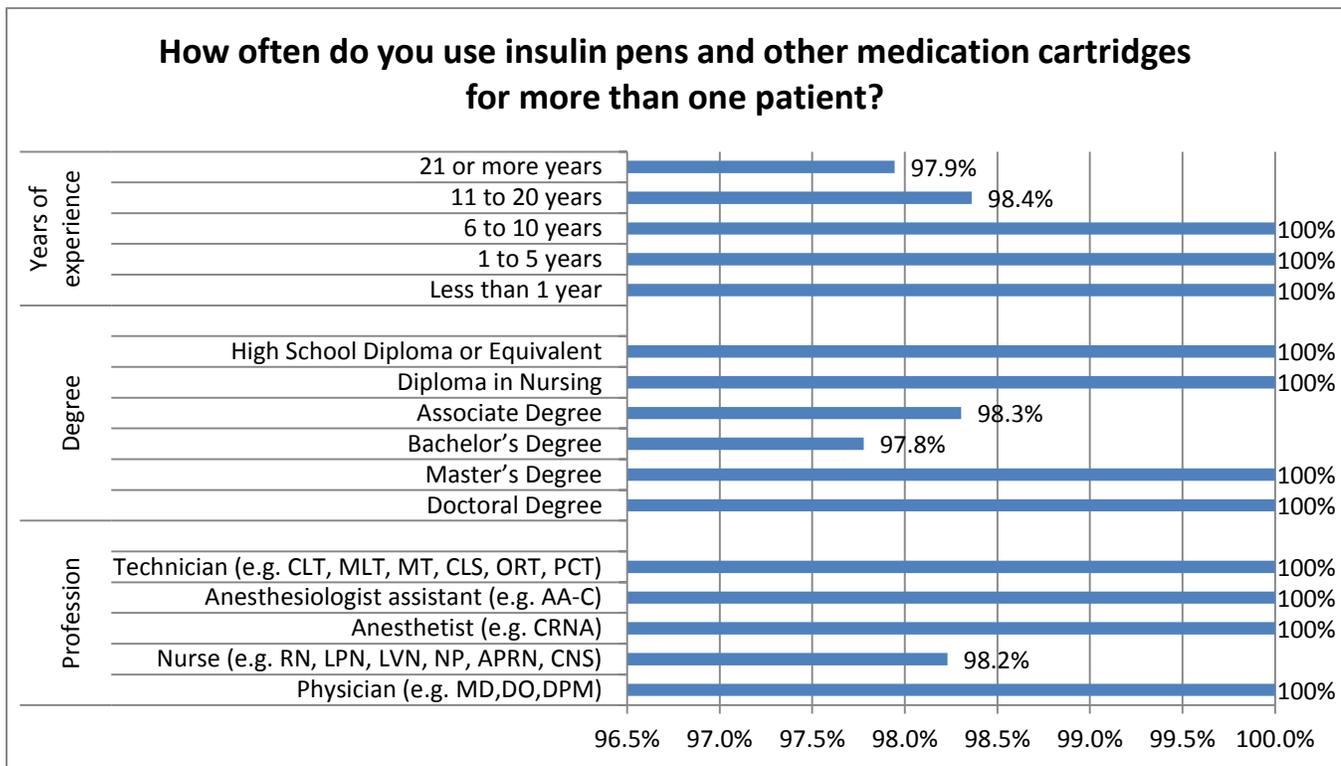


Figure 41: Frequency of Insulin Pen Use on More Than One Patient by Experience, Degree and Profession



Nearly all, 99% of HCW, answered that they ‘Never’ use insulin pens for more than one patient (Figure 39). Figure 40 shows a more detailed look at those that correctly identified the CDC best practice in regard to the use of insulin pens. Figure 41 shows a more detailed look at those who never use insulin pens for more than one patient in their practice. CDC recommendations state that Insulin pens, other medication cartridges and syringes are for single-patient-use only and should never be used for more than one person

Limitations:

In general, the largest limitations of surveys are sample size and representativeness of the population. Our survey is no different. The number of ASCs surveyed accounted for approximately 51 percent (63 out of 124) of the total population of ASCs licensed in Michigan as of April 8, 2013. Similarly, only 287 of the 902 (33%) HCW surveys were completed.

The small sample size limits our ability to generalize our findings to the entire population of ASCs in Michigan. Given the small percentage of the population represented there is a possibility of survey bias; with those completing and returning the survey being significantly different than those who choose not to participate. Therefore, we cannot be sure that the injection safety knowledge or practices of the sample populations are representative of the entire ASC HCW population. To reduce the impact of this limitation, future research should utilize supplementary recruitment measures to increase the number of HCWs in the sample size. Survey data may also not be generalizable to HCWs in other settings (e.g. acute care, long-term care).

The specific method used for gathering data was also a potential limitation for the project. All data for this project was self-reported. Much of the survey requires participants to recall specific practices and activities. Any participant memory difficulties or inability to remember activities has the potential to introduce recall bias and adversely impact the accuracy of the data. The surveys included a variety of questions on injection safety knowledge. In an effort to address and reduce the impact of this specific limitation, we provided a ‘not sure’

answer options for all knowledge questions. This allowed participants an opportunity to answer the question without simply guessing.

Finally, we cannot be entirely sure that survey respondents answered questions truthfully. Especially in regard to injection safety behavior, HCWs may have been hesitant to report that they perform injections inconsistently with CDC guidelines. Survey respondents may have been particularly reluctant due to the fact that the State health department was collecting the data. However, we took measures to ensure confidentiality of the survey responses. We did not ask for individual names of persons taking the survey, nor did we identify which facility respondents worked in. Because the survey remained anonymous, we think this encouraged truthful responses.

Discussion:

The information gathered in these surveys suggests that healthcare workers providing healthcare within ambulatory surgery centers are mostly aware of CDC injection safety guidelines and best practices. However, we did identify some areas where education could be improved, such as multi-dose medication vials and blood glucose monitoring equipment like fingerstick devices and insulin pens. Furthermore, there seems to be some gaps in healthcare worker knowledge and practice. Despite knowledge of injection safety being high, some healthcare workers still practice in a manner inconsistent with CDC guidelines. Comparable studies have shown similar patterns with hand hygiene. All healthcare workers know to wash their hands before and after caring for a patient, but many do not. In these circumstances, facility administrators must push a culture of safety where patient well-being is the highest priority and where there is no excuse of non-compliance.

Though the majority of HCWs followed CDC guidance, even a minority practicing incorrectly could potentially lead to many patients being exposed to someone else's blood. One can imagine an individual who performs 25 injections per day, 5 days per week, year after year. If safe injection protocols are not being followed, either due to ignorance or negligence, this could result in numerous instances of patients being exposed to another's blood. Even changing one person's poor injection safety practices is a success. Nothing less than 100% of clinicians practicing correctly should be acceptable.

The goal of our project is to increase the proportion of healthcare workers who are educated on CDC's injection safety guidelines and follow them in practice, thus resulting in safer injections for Michigan patients. This survey helped determine baseline knowledge of injection safety guidelines in Michigan ASCs and areas of greatest need for future projects and educational efforts. Further research is needed to determine if these observations are unique to healthcare workers in ASCs or if healthcare workers in other settings (e.g. acute care, long-term care) have similar injection safety knowledge and practice.

If you have any further questions about this project, please contact the Michigan Department of Community Health, HIV/STD/VH/TB Epidemiology 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/>