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A Litreture Review for Injection Technique During Treatment and Risk for Needle Stick Injury

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Abstract

Literature review on injection history and safe practices Drugs made the syringe handy. French pharmacist Stanislau Limousin devised the glass "ampoule" for safe, convenient injections in 1886. Handcrafted late 1800s glass and metal syringes cost $50. The 20th century saw the rise of the syringe for injecting insulin, penicillin, and other antibiotics. 2. Poor nations treated kala azar and yaws with the injection in the 1920s. After WWII, penicillin was popular. 10. 100,000 to 2 million syringes were produced 40 times between 1920 and 1930. Increased demand.

The 1950s and 1960s saw disposable syringes replace sterilizable glass ones due to technology. Nepal has disposable syringes since 1980. 15. The latest safe injection innovations include retractable, decreased dead space, auto-disable (AD), and needleless jet injectors.

Safe Injection Practice Literature Syringes made parenteral medicine feasible, changing medical history. It's bad because it spreads illnesses. In the late 1800s, syringe-transmitted viruses caused jaundice and syphilis epidemics; in the 1900s, HBV, HIV, and HCV were detected. 10.22 The first syringe-transferred pathogen may have happened in a Swedish workplace in 1883 after smallpox vaccines. 22 and 23 Early 1900s syphilis injection jaundice was attributed to arsenic. 9 In 1945, jaundice-causing microorganisms were introduced into non-sterile injections, triggering safe injection programs in developed nations. 25 Industrialized nations supplied sterilized injectable drugs, needles, and syringes.

Developing and transitional nations had more vaccines and treatments. Disease may have spread in these nations due to improper injection equipment cleaning.

Injection Lore in Medical Practice Reusing injectable devices without sterilizing (unsafe injection) occurred internationally, although rates varied. Nepal and India, part of SEAR D, reused 75% of injectable devices without sterilizing, compared to 1.2% in American B and European B. Ten locations' annual non-sterilized injectable device reuse frequency

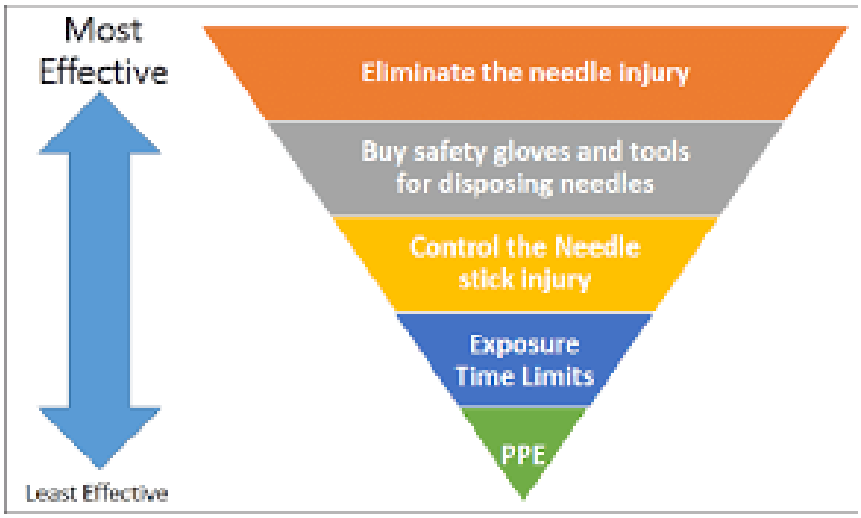
INTRODUCTION

An extensive range of medical treatments, such as the administration of therapeutic drugs (mainly in the form of boluses and infusions) or immunizations, blood transfusions, phlebotomy procedures, and the insertion of intravenous devices, are all examples of the types of procedures that make use of injections. In addition, needles are employed in the lancet technique and in medical procedures such as acupuncture, which require entering the skin. These treatments are examples of therapies that are considered to be of this kind. All of the following concepts were defined in the following manner for the purpose of our investigation:

Injections are defined as "a skin-piercing event performed with a syringe and needle with the purpose of introducing a curative substance or a vaccine into a patient by various routes." This description describes the way in which an injection is administered. Eight and ten Any additional skin-piercing operations, such as the use of a needle to transfuse blood, phlebotomy for diagnostic purposes, injections for drug usage, or any of the other procedures that have been mentioned above, as well as any other treatments, are not included in this phrase.

A safe injection is characterized by the phrase "one that does not cause any harm to the recipient, does not put the health worker in any danger, and does not result in waste that is hazardous to the community." No. 111 Therefore, safe injection is defined as the utilization of a sterile device (such as a syringe, needle, or other similar item), the execution of a sterile procedure by an individual who is certified and has received adequate training, and the disposal of used devices in a container that is both leak-proof and puncture-proof, the container being specifically designed for the purpose of correct disposal. 1. It was determined that the injection event that occurred as a consequence of any of the actions mentioned above being made insecure was considered to be hazardous.

If oral alternatives are available, or the substance that is being injected is inappropriate or dangerous, the definition of an unnecessary injection has been expanded to include "one that is available."



IN THIS REVIEW OF LITRATURE FOR USE OF NEEDLE AND ITS RISK FOR INJURIES

SR.NO	REVIEW OF LITRATURE	SUMMERY
1	**LITRETURE REVIEW OF HISTORY OF INJECTION AND SAFE INJECTION PRACTICE**	Medicines made the syringe useful. In 1886, French pharmacist Stanislau Limousin invented the glass "ampoule" for safe and easy injectable treatments. Late 1800s handcrafted glass and metal syringes cost $50. The syringe became popular in the 20th century for injecting insulin, penicillin, and other antibiotics. 2. Poor countries used the injection to treat kala azar and yaws in the 1920s. After WWII, penicillin became popular. 10. 1920-1930 syringe production grew 40 times from 100,000 to 2 million. Increased demand and use dropped syringe prices, promoting mass manufacture.

		Due to technology, disposable syringes replaced sterilizable glass ones in the 1950s and 1960s. 2. Nepal has disposable syringes since 1980. 15. Retractable, reduced dead space, auto-disable (AD), and needleless jet injectors are the newest safe injection advances.
2	**LITRETURE OF SAFE INJECTION PRACTICE**	Parenteral medication was made possible by the syringe, which changed the course of medical history. It is unfortunate since it spreads infections. While syringe-transmitted viruses were found in outbreaks of jaundice and syphilis in the late 1800s, HBV, HIV, and HCV were discovered in the 1900s. 10.22 In 1883, following smallpox immunizations, the first syringe-transferred pathogen may have occurred in a Swedish workplace. 22 and 23 Syphilis injection jaundice was thought to be caused by arsenic in the early 1900s. 9 The germs that might cause jaundice were introduced into non-sterile injections in 1945, prompting developed nations to launch safe injection programs. 25 A supply of sterile injectable medication and needles and syringes was supplied by the industrialized world. Vaccine and treatment availability increased in developing and transitional countries. Injection equipment in these countries was not always cleaned, which might have led to the spread of disease.
3	**LITRETURE OF INJECTIONS IN MEDICINE PRACTICE**	Reusing injectable devices without sterilizing (unsafe injection) was found globally, but rates varied. SEAR D (South East Asia Region D), which encompasses Nepal and India, reused 75% of injectable devices without sterilizing, compared to 1.2% in American B and European B. Table 2.1 displays 10 areas' yearly non-sterilized injectable device reuse frequency and percentage.

LITRATURE OVERVIEW FOR USE OF NEEDLE AND ITS RISK FOR INJURIES

LITRETURE REVIEW OF HISTORY OF INJECTION AND SAFE INJECTION PRACTICE

William Harvey laid the groundwork for the groundbreaking work of renowned physicist Robert Boyle and his colleague Timothy Clark (1660) by describing the closed system of blood circulation in 1626. Researchers looked at how well various medications worked when Tobacco oil, opium, and antimony all had their usual effects when given intravenously, according to trials carried out at the newly formed Royal Society of London (1662). Injecting medication back then required a syringe constructed from an animal bladder attached to a goose quill. Research on injectable dose forms reached a turning point in the late 1650s. 20 Before this, the conventional wisdom was that a medicine could only exert its effects when administered within the human digestive system.

In 1848, the syringe was created. 2. Alexander Wood developed a hollow needle in 1853 to administer opioids to treat neuralgia21, and a few years later, he thought of injecting more medications, the syringe turned into a highly useful medical tool. French pharmacist Stanislau's Limousin invented the glass

"ampoule" in 1886 as a convenient and safe way to deliver injectable solutions. In the late 1800s, handcrafted glass and metal syringes were extremely expensive (about US$50). Because the syringe was used to inject insulin, penicillin, and other antibiotics throughout the 20th century, its use grew in popularity. 2. The injection was initially used to treat kala azar and yaws in poor nations in the 1920s. After the Second World War, when penicillin was developed, it was widely utilized and gained popularity. 10. Between 1920 and 1930, the world's syringe manufacturing grew 40 times, from 100,000 to 2 million, in a ten-year period. The price of syringes began to drop as a result of increased demand and use, which prompted mass manufacture.

The disposable syringe took the role of the sterilizable glass syringe in the 1950s and 1960s due to the ongoing advancements in technology. 2. In Nepal, disposable syringes have been accessible since the 1980s. 15. The newest innovations for safe injections are needle retractable syringes, reduced dead space syringes, auto-disable (AD) syringes, and needleless jet injectors.

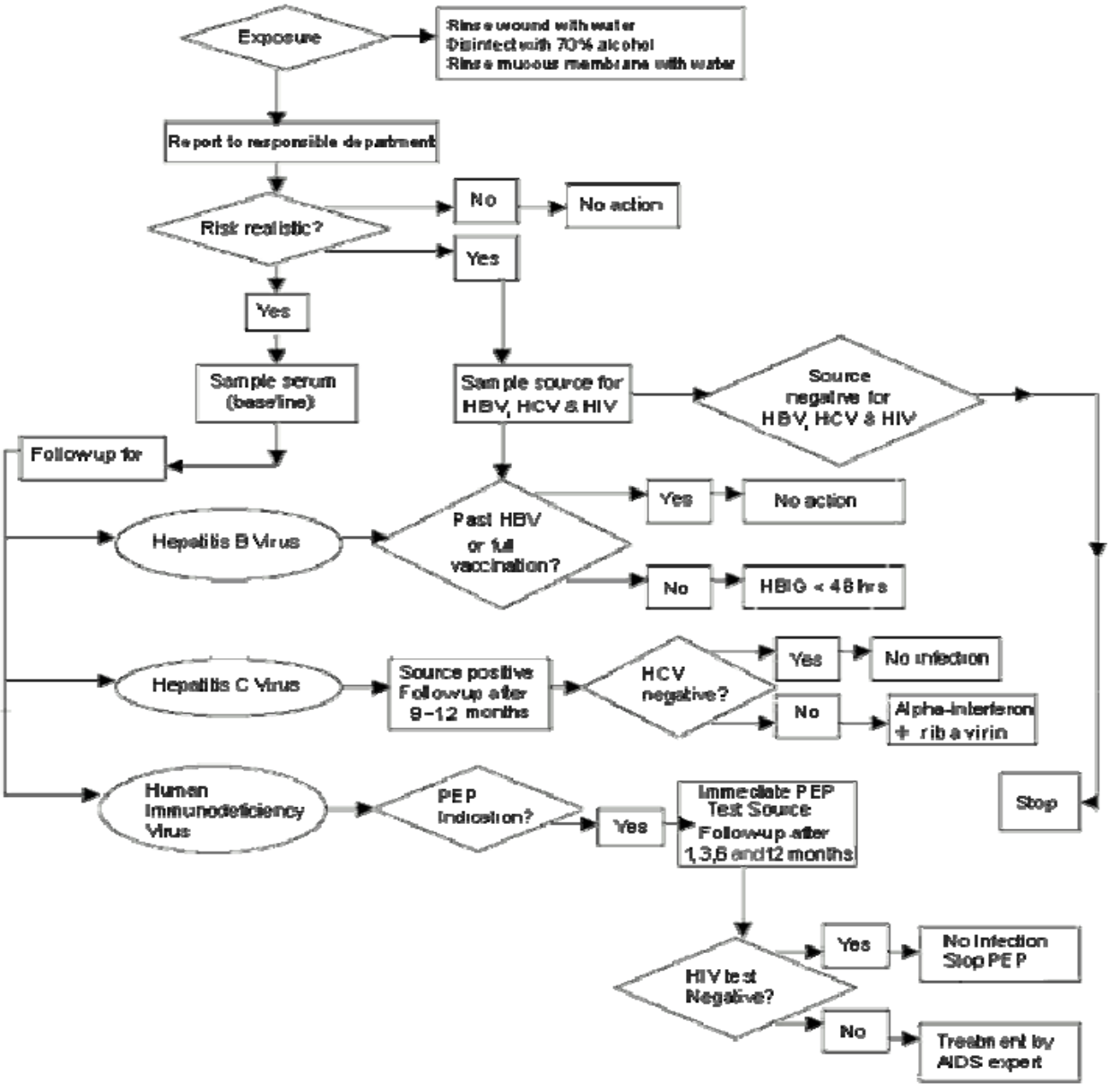
LITRETURE OF SAFE INJECTION PRACTICE:

The creation of the syringe was a significant milestone in medical history, allowing a novel method for the delivery of medication via the parenteral route. Regrettably, it also facilitated the transmission of pathogens between individuals. Although the majority of viruses transmitted by syringes (primarily HBV in 1967, HIV in 1983, and HCV in 1989) were identified in the 20th century, indications of their transmission were apparent in the late 19th century through epidemics of illnesses such as syphilis and jaundice. 10.22 The initial documented transfer of a pathogen via syringe may have transpired at a Swedish workplace in 1883, after to smallpox vaccinations. 22, 23 In the early 20th century, jaundice resulting from syphilis treatment injections was acknowledged, although physicians attributed it to administered arsenic rather than a contaminated pathogen from the syringe. 9 By 1945, it was shown that non-sterile (contaminated) injections conveyed the bacterium responsible for jaundice, prompting the initiation of safe injection campaigns, particularly in industrialized nations. 25 The delivery of injectable medication using a sterilized syringe and needle commenced, particularly in industrialized nations. During this period, the utilization of injections for therapeutic and immunization purposes increased in developing and transitional nations. In such nations, the sterilization of injection equipment before to use was not consistently implemented, resulting in the potential spread of several diseases due to the reuse of unsterile injections.

The initiatives for the safe injection was very effective in developed countries by the late 20th century but had not received the required attention in developing countries. Ten The unwarranted and hazardous application of injections, particularly in developing and transitional nations, has elicited heightened apprehension among international entities like the WHO, as well as national health officials, policymakers, physicians, and other healthcare professionals, prompting the establishment of collaborative efforts among organizations and individuals with shared interests. In 1999, the WHO developed the "Safe Injection Global Network" (SIGN) to facilitate this collaboration. In 1999, UNICEF, UNFPA, and the WHO together urged all nations to exclusively utilize auto-disable (AD) syringes for vaccination by 2003. This joint declaration was issued in light of the significant risks linked to syringe reuse and the declining costs of AD syringes.

Eight Consequently, the year 1999 was pivotal for safe injection practices. SIGN, which seeks to ensure the safe and proper use of injections worldwide, advocates a three-part core technical plan to enhance injection procedures, comprising: Eleven a) Modifying the conduct of patients and healthcare workers

b) Guaranteeing the availability of equipment and supplies, and c) Safely handling sharp waste. The use of intervention measures, grounded on these components, in both developed and developing nations (namely India and Indonesia, excluding Nepal from the Southeast Asia area) has had a beneficial impact on enhancing injection safety. The concurrent deployment of all three components results in a more favorable impact on enhanced injection safety. 26 Additionally, at the national level, SIGN has been involved in advising governments on waste management, healthcare worker safety, and the cost-effectiveness of injectable devices.



LITRETURE OF INJECTIONS IN MEDICINE PRACTICE

Injection is a significant healthcare practice utilized globally. Billions of injections are administered globally for therapeutic and immunization purposes. Over 95% are utilized for medicinal purposes, whilst fewer than 5% are employed for vaccination. 1 The health (medical technology) sector differs from other markets in that, regarding recovery and the preservation of good health, every possible measure is pursued. Consequently, individuals endeavor to find a cure for a certain ailment, if one is available. Moreover, the

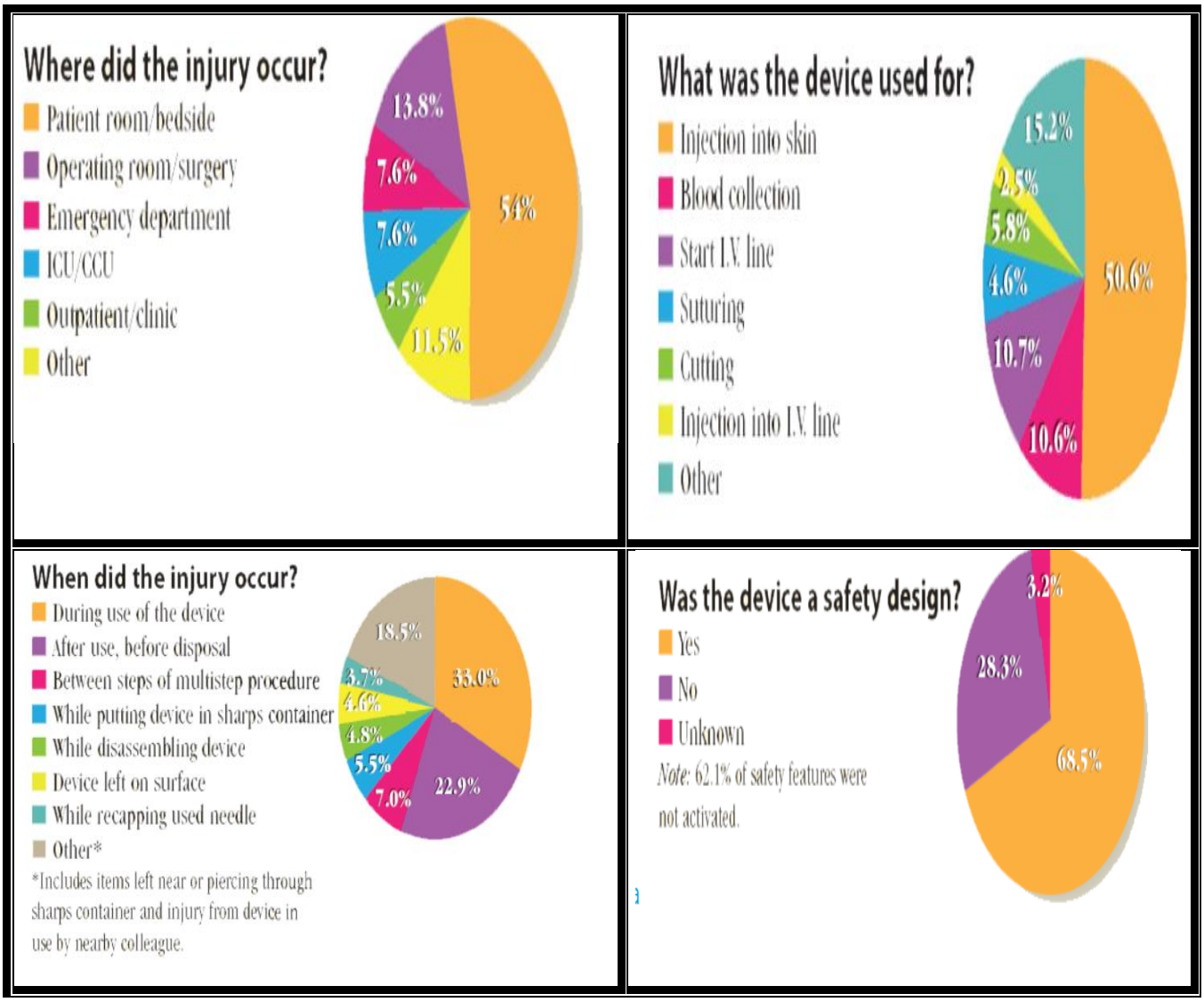
prescriber wields more influence in selecting the technology, particularly in poor nations such as Nepal, than the user (consumer) for whom the technology is intended. Injections act rapidly and may circumvent absorption, which is especially crucial when managing patients with acute illnesses and/or those who are unconscious or severely incapacitated (unable to swallow). It is also beneficial for people experiencing nausea and vomiting after oral medication administration. It may also be utilized to circumvent issues of non-compliance, particularly in recalcitrant and uninformed individuals. Health care workers (HCWs) can ascertain that the patient has received therapy immediately upon administering an injection, in contrast to tablets, which are ingested by the patient at a later time. It is regarded by both prescribers and patients as one of the most effective methods for restoring or sustaining health, so it is prevalent in underdeveloped nations..a. Worldwide use of injections In 2003, Hutin et al conducted a literature analysis to examine global injection practices regarding frequency and safety for the year 2000. The survey encompassed both official and informal healthcare institutions.

For the review, the WHO utilized areas defined by geography and mortality patterns, examining injection practices in 10 of the 14 regions. The box below displays the nations encompassed within the areas specified by the WHO. Countries categorized under WHO-defined areas based on geography and mortality patterns (Source:Hutinetal2003)Six The African region D (AFR D) comprises the following countries: Algeria, Angola, Benin, Burkina Faso, Cameroon, Cape Verde, Chad, Comoros, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Madagascar, Mali, Mauritania, Mauritius, Niger, Nigeria, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone,andTogo. The African region E (AFR E) comprises Botswana, Burundi, Central African Republic, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Eritrea, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, Swaziland, Uganda, United RepublicofTanzania,Zambia,andZimbabwe. The American region B (AMR B) comprises the following countries: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Brazil, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, El Salvador, Grenada, Guyana, Honduras, Jamaica, Mexico, Panama, Paraguay, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, TrinidadandTobago,Uruguay,andVenezuela. The American region D (AMR D) comprises Bolivia, Ecuador, Guatemala, Haiti, Nicaragua, andPeru. The Eastern Mediterranean region D (EMR D) comprises Afghanistan, Djibouti, Egypt, Iraq, Morocco, Pakistan, Somalia, Sudan, and Yemen. The European region B (EUR B) comprises Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Georgia, Kyrgyzstan, Poland, Romania, Slovakia, Tajikistan, Macedonia, Turkey, Turkmenistan, Uzbekistan, and Yugoslavia.

The European region C (EUR C) comprises Belarus, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, the Republic of Moldova, the Russian Federation, and Ukraine.

The South East Asia region B (SEAR B) comprises Indonesia, Sri Lanka, and Thailand. The South East Asia region D (SEAR D) comprises Bangladesh, Bhutan, North Korea, India, Maldives,Myanmar,andNepal.

The Western Pacific region B (WPR B) comprises: Cambodia, China, Cook Islands, Fiji, Kiribati, Laos, Malaysia, Marshall Islands, Federated States of Micronesia, Mongolia, Nauru, Niue, Palau, Papua New Guinea, Philippines, Republic of Korea, Samoa, Solomon Islands, Tonga,Tuvalu,Vanuatu,andVietnam. The research assessed the yearly frequency of injection usage to be 3.4 injections per individual, with a range of 1.7 to 11.3. The reuse of injectable devices without adequate sterilizing (unsafe injection practice) was observed across all areas, however the prevalence of this practice varied by region. The reuse of the injection device without adequate sterilizing was minimal (1.2%) in American B and European B areas,



but it was maximal (75%) in SEAR D (South East Asia Region D), which encompasses Nepal and India. Table 2.1 presents the yearly frequency and percentage of reuse of non-sterilized injectable devices across 10 global areas.

Nurse injuries from sharp objects and needlesticks

Mitchell and Parker's essay from September 2015, titled "Preventing Needlesticks and Sharps Injuries," brings up some very valid points. Applying a device's so-called "safety design" is one example of this. While most of these designs do provide a way to cover the sharp edge after usage, the methods for doing so differ in terms of both convenience of use and effectiveness. Consequently, certain designs may do far better than others in terms of attaining safety in the About 64% of injuries included devices with safety features, according to data from the "Was the device a safety design?" survey. Additionally, we have been informed that the safety feature was not engaged in around 62% of the cases when the term "safety design used" was used. Naturally, this leaves 38% for the cases when injuries occurred despite the implementation of a safety design. Extra focus should be given to both the absence of usage and harm sustained when using.

There are a variety of reasons why people don't use safety features, including just not caring or actively

believing that using them may put them in harm's way. This may be a valid judgment for certain designs when the necessary manipulation to activate the safety feature increases the risk of harm caused by the device itself. It could be a sensible choice to actively avoid using devices that require two hands or that are significantly simpler to use with two hands than one.

With the added caveat of "injury while using," it's quite evident that the design is hazardous; this is probably due to the fact that it requires deft hand and finger motions, which may easily cause harm. The "After use, before disposal" category of when injuries occur also pertains to these procedures. In the case of "safety designs," the time it takes to activate the safety feature after usage ends is also considered part of the total time required for safe disposal.

All of these problems point to the necessity of differentiating between safety-providing technologies in theory and those that really work in practice. Failure of a device to provide the promised level of safety results in needless danger, the misplaced belief that safety can be attained, and the squandering of resources. In order to comprehend why sharps injuries might happen despite the adoption of a "safety design," it is crucial to know which brand and type of instrument was involved.

DISCUSSION

Based on the literature review, here is a potential flow chart for addressing needle stick injuries:

- **Risk Assessment**
  - Identify healthcare workers at risk of needle stick injuries (e.g., nurses, doctors, waste handlers)
  - Assess knowledge and practices regarding needle stick injury prevention
- **Education and Training**
  - Provide education on needle stick injury prevention and management
  - Emphasize importance of following Universal Precaution Guidelines
  - Train healthcare workers on proper needle handling and disposal techniques
- **Needle Stick Injury Reporting**
  - Establish a protocol for reporting needle stick injuries
  - Ensure all healthcare workers are aware of the reporting procedure
- **Post-Exposure Prophylaxis (PEP)**
  - Provide PEP to exposed healthcare workers
  - Ensure timely initiation of PEP
- **Follow-up Care**
  - Provide follow-up care to exposed healthcare workers
  - Monitor for seroconversion
- **Vaccination**
  - Offer Hepatitis B vaccination to healthcare workers
  - Ensure waste handlers are vaccinated against Hepatitis B
- **Monitoring and Evaluation**
  - Monitor incidence of needle stick injuries
  - Evaluate effectiveness of prevention and management strategies

CANCLUSION

The literature review suggests a flow chart for addressing needle stick injuries, which includes a risk assessment, education and training, reporting, post-exposure prophylaxis (PEP), follow-up care,

vaccination, and monitoring and evaluation. Key recommendations include establishing a protocol for reporting and managing needle stick injuries, providing education and training on prevention and management, ensuring healthcare workers follow Universal Precaution Guidelines, offering Hepatitis B vaccination, and monitoring and evaluating the effectiveness of prevention and management strategies.

KEY RECOMMENDATIONS

1. Establish a protocol for reporting and managing needle stick injuries
2. Provide education and training on needle stick injury prevention and management
3. Ensure healthcare workers follow Universal Precaution Guidelines
4. Offer Hepatitis B vaccination to healthcare workers
5. Monitor and evaluate incidence of needle stick injuries

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