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Assess the effectiveness of interventions on Knowledge of Nurses towards High Alert Medications (HAMs) in Hospital Kanowit

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INTRODUCTION: Study showed administration state account for most medications errors and the factors are lacking of knowledge and awareness [5] [6] [7]. This can be observe through whenever there is involvement in dose calculation, rate of infusion of high alert medications and setting of the infusion pump, nurses tend to get confused easily. There are **14 cases of near-misses detected** on year 2014. We would like to explore their knowledge and awareness level as the base line, then implementing interventions that helps to increasing nurse's knowledge and awareness.

OBJECTIVES: This study aim to improve the awareness and knowledge level of staff nurse toward High Alert Medication.

METHODS: Our study will be a comparative cross sectional study. All respondents given a pre-interventional test, and based line taken. Interventions (HAM logo, educational talk, HAM dilution and HAM list pocket guide) implemented, and a post-intervention test given to same respondents. Our target is to get all the nurses involved. However the minimal sample size is at least 30 participants for Paired T-test to be valid.

RESULT AND DISCUSSION: There are total of 32 respondents included in this study. We found that respondents with post basic or further trained in midwifery and hemodialysis in our study will score 6.6 marks higher then respondent without post basic after we performed MLR. This might due to they are more willing to learn compare with others. [*Adj. b* value was 6.6; *p* value was 0.04]. Pre-intervention mean score was 69.13(SD 7.94); post-intervention mean score was 78.53 (SD8.00). This show significantly 9.40 marks of improvement after intervention [*p*-value was <0.001].

CONCLUSION: Nurses who have further training (post basic on midwifery and hemodialysis) were the only factors affecting the pre-interventional score. Interventions carry out in this study show significant effects in increasing the knowledge and awareness of staff nurse towards high alert medications.

KEY WORDS: High Alert Medications (HAMs); Nurses; Knowledge

Introduction:

Medication errors are significant and often preventable healthcare problems. [1] Although medication errors happen often, accounting for nearly one in every five doses, in typical hospital and skilled nursing facility. The percentage of errors rated potentially harmful was only 7%, or average more than 40 per day per 300 inpatients [2] However, some medications known to carry a higher risk of harm than other medications; and errors in administering these medications can have catastrophic clinical outcomes these known as High Alert Medication (HAM) [1].

According to guidlines given by ministry of health malaysia, these are the categories of medication that need to be highlited as high alert medication, IV (intravenous) adrenergic agonists, (e.g. adrenaline, noradrenaline), IV adrenergic antagonists, (e.g. propranolol, labetalol), genera or inhaled or IV Anaesthetic agents, (e.g. propofol, ketamine, dexmedetomidine). IV Antiarrythmias (e.g. lignocaine (lidocaine), amiodarone), antithrombotic agents (e.g. warfarin, heparin, tenecteplase, streptokinase), Antivenom (eg. Sea snake, cobra, pit viper antivenom) IV Inotropic medications, (e.g. dobutamine, dopamine), Neuromuscular blocking agents (eg.pancuronium, atracurium, rocuronium, vecuronium), Antifibrinolytics, hemostatic Chemotherapeutic agents, parenteral and oral Dextrose, Hypertonic, 20% or greater, Epidural and intrathecal medications, Glyceryl Trinitrate injection, Insulin, subcutaneous and IV, Magnesium Sulphate Injections, Moderate sedation agents, IV Opiates and Narcotics, Parenteral Nutrition preparations, Potassium salt injections, and Sodium Chloride Solution (greater than 0.9%). [1]

Listed high alert medication above most of it are Intravenously form of medication, and according to a study done by krahenbuhl-Melcher 2007, intravenously administered drugs associated with the highest error frequencies. [3]. this supported by the research done by Johanna I Westbrook 2011, of 568 intravenous administrations, 69.7% (n=396; 95% CI 65.9 to 73.5) had at least one clinical error and 25.5% (95% CI 21.2 to 29.8) of these were serious. [4] In the same study, they also identify four type of errors(wrong IV rate, mixture, Volume, and drug incompatibility) and out of these four the most prominent errors in IV administration is **wrong rate.** [4] Thus, **administration state** accounts for the major portion of Medication errors [3, 5]

even thought Medication error could occur at any stage. [1, 3] This gives us the justification why our studies only targeting staff nurses, and focusing on high alert medication.

On top of that, according to research done by Bergqvist 2012 in Sweden, these are the six medications error identified done by Nurses that is **wrong dose** administered, **wrong drug** given due to mix-up of the drugs, dose(s) missed, unauthorized/unordered drug administered, **wrong route** of administration, drug administered despite documented allergy. However they did not rank the medications errors. [6]

On the other hand, according to a retrospective study done by Phillips 2001, out of 469 fatal medication errors reviewed, human errors such as administering a **wrong dose** (40.9%), **wrong drug** administration (16%) and **wrong route of administration** (9.5%) consider to be the most prominent medication error. [7] Another study done by Tang 2007, the two common errors found in this research were **'wrong dose'** (36·1%) and **'wrong drug'** (26·4%). [8]

After finding out the most medication errors are causes by nurses during the administration phase. And the most widely errors done were wrong drug administered, wrong dose (wrong rate of administration), wrong rate route of administration. Thus now we are looking at the factors that lead to administration error, and thus getting an idea to counter the leading factors.

Again form the research done by Bergqvist 2012 in Sweden, Contributing factors that leads to medication are a lots, organisation factors such as **organisational routines and culture**, **location of medication and look-alike medication**, and l**ack of adequate guidelines or information.** Personnel factors such **as Negligence, forgetfulness or lack of attentiveness**, and last but not the least most of the cited study shows that **lack of adequate knowledge** is the main contributing factor. [6]

According to research done by Philips 2001 main factor lead to such errors are due to **knowledge deficit** (44%). [7] This well supported by other studies also stated that Nurses' insufficient

knowledge considered to be one of the most significant factors contributing to medication administration error. [3, 5, 6]

Moreover, according to study done by Johanna I Westbrook 2011, shows that each year of experience, up to six years reduces the risk of error by 10.9% and serious error by 18.5%. This clearly shows that, as year of serving increase, clinical experiences (knowledge) increase, rate of administration error reduces. [4]

Furthermore research done by Tang 2007, that try to investigates nurses' views on the factors contributing to medication errors in the hope of facilitating improvements to medication administration processes. 72 female nurses who responded believe **'Personal neglect'** (86.1%), **'heavy workload'** (37.5%) and **'new staff'** (37.5%) were the three main factors in the eight categories. [7, 8] These findings are similar to study done by Bergqvist 2012.

All in all, from all the cited study above we can conclude that here are many factors that lead to medication error, and it can happen in almost every steps in patient care. However most of the study showed the leading factors that lead to medication errors are due to lacking of knowledge or knowledge deficit.

So by in our study we would like to explore their knowledge and awareness level as the baseline, then implementing interventions that helps to increasing nurse’s knowledge and awareness.

In this study, we attempt to increase the awareness of staff nurse in Hospital Kanowit toward HAM. Developing HAM logo stickers that adopted from guideline on safe use of High Alert Medication from Ministry of Health Malaysia. Whereby, these stickers will be stick to the compartment that store HAM, and while supplying HAM to wards.

We will also check and see necessity to rearrange all the sounds alike look alike medications that store as floor stocks or emergency trolley during the process of labelling the compartment carrying out. This help to change the culture and routines among nurses, whereby it increase the

alertness and awareness of nurses on HAM and towards a more alert working environment. Furthermore, picture always speaks better than words. This measure counter the factors lead to medications study done by [6], which is **organisational routines and culture**, **location of medication and look-alike medication, and personal factors like Negligence**.

On the other hand, we attempt to increase nurse's knowledge on High Alert Medication, by developing teaching material and educational intervention. [5] Moreover, according to study done by Lu 2013, simplification and standardization is the main principles in administering high-alert medications. Health professionals should be familiar with all drug regulations, which must strictly followed. [5] This give us an idea to developed a referring standardise material.

First, we develop a High alert medication pocket guide, which include all the standard dilution, suitable diluents, route and ways of administration, and stability after dilution. This pocket guide will allow the nurses to carry it during their duty and referring it any time when they are handling high alert medication.

This HAM pocket guide will help to counter risk factors such as **lack of adequate guidelines or information, and knowledge** that we mention earlier on. This fits the idea suggested by study done by Lu 2013 as a teaching material and standardisation in administration of high alert medication. With this we will be able to make sure correct medications administered in the correct dose and route. [5]

Besides, we also developed a pocket high alert medication list, which all the nurses can always carry with them during their duty. This is exactly same idea as the high alert medication pocket guide. This helps the nurses to be able to remember and identify high alert medication more easily as they can always refer to the list. Comparing to the original high alert medication list which kept in the file whereby not being fully utilise by the staff nurses. This help to improve the awareness toward high alert medication.

High alert medication course carried out as one of the educational interventions; the content of this high alert medication course will include introduction of high alert medication and the strategies to avoid medication errors. Furthermore in this course, it also included calculations that involve high alert medication, it give many practice section for all the nurses to refresh and learn to do calculation. This helps to prevent administration high alert medication in wrong rate. If from this research it shows significant results, we are planning to make this course annually to create a sustainable awareness and improvement towards high alert medications.

To reduce administration medication errors done among nurses especially on High alert medication, it is necessary for us to do intervention to improve awareness and knowledge level among nurses in our hospital setting respectively. This research benefit every single study subject, as this serve as a refresher course which help to improve the confident of involved nurses in handling of high alert medication.

High alert medication talk done since year 2013, however the knowledge and awareness level of nurses towards high alert medications are still relatively low. This can be observe through whenever there is involvement in dose calculation, rate of infusion of high alert medications and setting of the infusion pump, nurses tend to get confused easily. There are 14 cases of near misses detected on year 2014.We would rather start the intervention first before major issues that relevant to high alert medications occur. We are not affordable to make any mistake as the cost for the patients are too high. Thus, this study aim to improve the awareness and knowledge level of staff nurse toward High Alert Medication by assessing awareness and knowledge level, explore the factors affecting the knowledge and awareness level and to explore the effectiveness of an educational intervention on Hospital Kanowit staff nurse knowledge and awareness regarding high-alert medications.

Methods:

Our study will be a comparative cross sectional study. In Hospital Kanowit there are 46 nurses including matron, sister and staff Nurse. Our target is to get all the nurses involved. However the minimal sample size is at least 30 participants for Paired T-test to be valid.

Only staff nurse, sister, and matron who undergo all the courses given included to this study. For those who not completed the pre and post-test excluded from this study.

We conducted a course on HAM, and our target group limited to staff nurse, sisters, and matron only even though there will be other hospital staff joining this courses.

A letter if invitation to all matron, sister and nurses will be distributes, and informed them about the HAM course. They informed there is a pre-test during the course and a post test after 1 month of the course.

Once they come to that course they will need to fill in a name list, with the questionnaire number, and sign for their attendance.

Informed consent taken to all participant before the pre-test and course started. The purpose of informed consent is to explain and get agreement for them to participate in this study. Stress to them the important and the need to attend all the courses in this 2 days and the post test one month later. This informed consent form also explained the confidentiality of the data, will only assessable by the principal investigator only.

After the informed consent, a validated questionnaire will be use as a tool to collect data. During the four weeks, all intervention will be implemented, and then a post test will be conducted.
The interventions are as listed below:

1. HAM logo will be implemented, whereby HAM logo will be stick to all trolley or compartment which store HAM.
2. Educational Talk on identifying, calculating, and dilution will be done in between the 4weeks gap before the post-test.
3. HAM Dilution and HAM list Pocket guild will be distribute to all Staff Nurse involve.

4. Rearranging and label the High alert medications storage compartment according to the sound alike and look alike guide and Tall man lettering.

Reliability and Validity of the measurement tools:

All the questions mainly adopted from a validated questionnaire from a study done by Lu 2013 with the title of Nurses' knowledge of high-alert medications: A randomised controlled trial. [5] A part from solely adopt the validated questionnaire; we do modify the questions that fit to our own setting.

After the modified questionnaire developed, we run a pre-testing and content validation among qualified Medical Officer and Pharmacist who all working in Hospital Kanowit. The reason we did not conduct the reliability test is due to the sample size of our project is small. (Pilot study needs at least 30 participants) This is the major limitation in this project.

Statistical Analysis:

Firstly, the data collected directly entered the analyses using the Statistical Package for social sciences (SPSS, version 15.0) for analysis. Profile of the respondents analysed and presented with appropriate descriptive statistics (mean and standard deviation for numerical data and frequency and percentage for proportions). Statistical test that will be use is Paired-T test. Whereby we compare a same group mean score pre test and post test and see there is any significant changes or not. Statistical significance set to be $P < 0.05$.To explore the factors that affect the pre and post test score, we are planning to use General Linear Regression to see the relationship of the factors and the outcome, the B coefficient show the magnitude of the relationship and statistical significance is set to be $P < 0.05$.

Results:

25 nurses, 6 sisters and 1 matron participated in this study. There are nurses from various department in Hospital Kanowit (listed in table 1), with an average age of 40±10 years and total year of service of 16±9.0 years. Only 6.3% earned a bachelor's degree, and majority of them 93.7% of them are diploma holders. (Table 1).

Table 1: Demographic Characteristic of 32 respondents

Variable	n (%)	Mean (SD)
Age	**-**	**40.16 (9.65)**
Total year of service	**-**	**16.2 (9.38)**
Education Level		
Degree	**2 (6.30)**	
Diploma	**30 (93.70)**	
Post Basic		
Yes	**7 (21.90)**	
No	**25 (78.10)**	
Position		
Matron/Sister	**7 (21.90)**	
Staff Nurses	**25 (78.10)**	
Unit		
Emergency & Trauma	**6 (18.75) 7 (21.86)**	
Maternity Ward	**5 (15.63)**	
Female Ward	**4 (12.50)**	
Pediatric Ward	**3 (9.38)**	
Male Ward	**3 (9.38)**	
Operation Theater	**4(12.50)#**	
Others		

SD=Standard deviation IQR=Inter Quartile Range

* The distribution skewed to the left

others included hemodialysis unit, infection control unit, In and out patient unit

Multiple linear regressions done to determine the factors which contribute to the pre-interventional score. Data on nurses' backgrounds, such as their educational level, position of nurses, and total year of service does not significantly contribute to the pre-intervention score of the nurses. However, we found that Nurses with or without post basic (further training in midwifery and hemodialysis) made a statistically significant contribution to their scores on the 30 questions in the questionnaire with the *p* value of 0.04 (Table II).

Table 2: Factors associated with pre-intervention score among 32 respondents

Variables	**SLR[a]**		**MLR[b]**		
	b (95% CI)	***P* Value**	**Adj. b (95% CI)**	***t*-stat.**	***P* Value**
Total year of service	0.31 (0.01;0.60)	0.043	-	-	-
Post Basic	**7.7 (1.27;14.1)**	**0.021**	**6.63 (0.292; 12.98)**	**2.14**	**0.04**
Education level	2.53 (-9.47; 14.53)	0.43	-	-	-
Position	4.77 (-2.04; 11.60)	0.16			

[a] Single Linear Regression

[b] Multiple Linear Regression (R^2=0.197; the model fits well; model assumption met; there is no interaction between the independent variables, and no multicollinearity problems)

b=Crude regression coefficient

From table III, we able to see the pre intervention mean score was 69.13 (7.94); post interventions mean score was 78.53 (8.00), mean score different was 9.4 marks, this show significant of improvement in the score after intervention (p value <0.001).

Table 3: Change of Knowledge and awareness score related high alert medication after the intervention among the 32 respondents.

Variable	Pre-intervention Mean (SD)	Post-intervention Mean (SD)	Mean of score difference (95% CI)	*t* statistic [a] (df)	*P* value [a]
Knowledge and awareness score	**69.13 (7.94)**	**78.53 (8.00)**	**9.40 (6.27 ; 12.54)**	**6.13 (31)**	**<0.001**

[a] **Paired t-Test**

Discussion:

The total number of nurses including sisters and matron in Hospital Kanowit was 46; our total respondent which fit to our inclusion criteria were only 32. There are 4 respondents which did not complete the educational intervention and the post test. The response rate is around 70% and this consider as satisfied response rate. However if compare our study to the study done by Min-Chin Lu 2011, their interventional group response rate are 100% which are ideal situation in our study. [5]

Again according to the study done by Min-Chin Lu 2011, factors which show significantly differences on the baseline score before the intervention were age, nursing experience, training in High alert medication, training in Emergency room or intensive care unit (ICU), and experience in Pediatric and ICU. [5]

However, there is some deviation of findings in our study done, first we are performing MLR to see the factors which will affect the pre intervention score (based line) of the respondents. In our module we only tested on the total year of service (nursing experience) but not the age of the

nurses, as this 2 variable are highly collated after checking the multicollinearity**,** and independent variable "age" had dropped out. Furthermore, in our study we also found that, total year of service does not affect the pre interventional test score among nurses in Hospital Kanowit unlike study done by Min-Chin Lu 2011. [5]

This might due to a lot of knowledge towards high alert medication are forgot as longer the service time (older age). This could possible happened especially in district hospital as we rarely exposed to the use of high alert medications.

We also found that, education level and position of the staff nurses do not affect the pre interventional test score. For educational level our findings are similar with the study done by Min-Chin Lu 2011. [5]

The only factor we found that was significantly affecting the pre intervention test score would be the nurses with post basic or not. We found that Nurses with post basic (further training in midwifery and hemodialysis) tend to score 7 marks (6.63) higher than those without post basic, this made a statistically significant contribution to their scores on the 30 questions in the questionnaire with the *p* value of 0.04. This could be explained by nurses who have post basic are those which are more willing to learn and pay a lot more attention to the previous continuous medical education given and high alert medication stickers implemented since 2013.

After providing about 3 hours of educational intervention (Introduction, identifying, calculation, and dilution) regarding high-alert medications, implemented the high alert medication logo in all compartment in wards, distributing the standard referral material (standard pocket dilution protocol of HAM and pocket list of HAM), and measuring intervention results, we consider that this was a satisfactory intervention study. This could be observed though the significant improvement (p value < 0.001) of score from 69.13% to 78.53 %(mean different of 9.4%). And our score improvements are comparable to similar study done by Min-Chin Lu 2011, whereby the percentage of score improvement was 13% and 19% respectively. [5]

Reasons that may explain the significant improvement in the post intervention score, might due to we can draw their attention and interest towards high alert medication, especially by the educational intervention on the calculating part. Besides there were also real example of calculation questions and the nurses given time to performed the calculation and competitive to answer the questions given during the education intervention course. Similar findings also found in research done by Wilson 2003, whereby those who took the practical test first improved their score more highly than those took the standard test. (t-test 2.93, $p = 0.005$, chi-square showed significance at $p = 0.005$)[9]

From the feedback comments , respondent are asking to showing step by step ways of calculation of the dosage based on body weight, infusion rate, infusion volume, infusion time, working with percentage, ratio, strength, and unit conversion on high alert medication in slides. This show many of them are interest in this area, they also mention such educational intervention serve as refresher course for them.

On top of that, another possible reason explain why the intervention was satisfactory and significant of improvement of the post intervention test score as the nurses very motivated in acquiring knowledge about high alert medications. This reason was also mention in the study done by Min-Chin Lu 2011.This can be explained further whereby according to research done by Tsai-Feng Lo et.al. 2013, nurses believed the ideal stage of training on high alert medications was during in-hospital continuing education (48.9%). [10] A part from that, after the post intervention test a set of feedback forms distributed to the respondents, to get their feedback on this course for future improvement. They expressed appreciation for the teaching and gave it average of 39 points over 40 points on the final evaluation. This also proved that nurses motivated and feel benefits from these educational interventions.

Parts from that all the educational intervention presented in assistant by visual aid material such as computer slides show. This might be another factor which contributes to the success of the intervention and improvement of the post intervention score. With visual aid, it gives better understanding to all the respondents. Besides, it also draws their attention and makes the

education process more interesting, thus respondent are able to absorb more information than usual. According to the research done by Tsai *et al.*, 2004, Taiwan, and Sherriff *et al.* (2011) Australia, they also found that, Multimedia program or computer based educational intervention had significant effect on knowledge (t-test 6.754, $p < 0.05$) and higher confident in dosage calculation respectively. And both the research shows high level of satisfaction. [11, 12]

A part from that, high alert medication logo at all compartment in the ward medication storage and the quick and assessable referral distributed, both of these also draw their attention and awareness to continue learn about high alert medications. These measures serve reminder of the existence of high alert medications. Both of these served as a long-term persistent interventional measure.

Limitation:

There are some limitations in this study; first, we assume the results of the pre and post test solely based on respondent knowledge and awareness. The respondents might just guess the correct answers. The duration of the effectiveness of our intervention measure is unsure, because of the time constraints in our formal study; we did not formally test this for longer than 4weeks; the knowledge and awareness level may decay after 4 weeks. On top of that, among all these interventions implemented which is the most effective measure not determined as well in this study. Reliability of the measuring tools needs to be determined and improved for future similar study.

Conclusion:

All in all, we found mean pre interventional test score of Hospital Kanwoit nurses was 69.13% and this score affected by the only factors found in this study which is the post basic status (further training in midwifery and hemodialysis) of the nurses. We also able to conclude that nurses with post basic average score 6.63 marks higher than those who are not. Last but not the least, all of our intervention measure such as educational intervention , referral material

distributed, as well as High alert medication logo of this study are promising in improving the knowledge and awareness level of nurses in Hospital Kanowit as the post intervention score was significant higher which is 78.53% (with mean difference of 9.40%; p value <0.001). This also support there is a need to include high alert medication education courses or talk into the orientation programme for all staff nurses or even all hospital staff in the future.

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References:

1. Ministry of Health Malaysia. GUIDELINE ON SAFE USE OF HIGH ALERT MEDICATIONS. Selangor, Malaysia: Pharmaceutical services division; 2011 p. 1-10.
2. Barker KN, Flynn EA, Pepper GA, et al. Medication Errors Observed in 36 Health Care Facilities. *Arch Intern Med.*2002; 162(16):1897-1903.
3. Krähenbühl-Melcher A, Schlienger R, Lampert M, et al. Drug-Related Problems in Hospitals. Drug Safety. 2007;30(5):379-407.
4. Westbrook J, Rob M, Woods A, et al. Errors in the administration of intravenous medications in hospital and the role of correct procedures and nurse experience. BMJ Quality & Safety. 2011;20(12):1027-1034.
5. Lu M, Yu S, Chen I, et al. Nurses' knowledge of high-alert medications: A randomized controlled trial. Nurse Education Today. 2013; 33(1):24-30.
6. Bergqvist M, Karlsson EA, Björkstén KS, et al. Medication Errors by Nurses in Sweden-Classification and Contributing factors. Journal of Mass Communication and Journalism. 2012; 03(01).
7. Phillips J, Beam S, Brinker A, et al. Retrospective analysis of mortalities associated with medication errors. Am J Health Syst Pharm 2001; 58 (19): 1835-1841.
8. Tang F, Sheu S, Yu S, et al. Nurses relate the contributing factors involved in medication errors. J Clin Nurs. 2007;16(3):447-457.
9. Wilson A. Nurses' maths: researching a practical approach. Nursing Standard. 2003;17(47):33-36.
10. Lo T, Yu S, Chen I, et al. Faculties' and nurses' perspectives regarding knowledge of high-alert medications. Nurse Education Today. 2013;33(3):214-221.
11. Tsai S, Tsai W, Chai S, et.al. Evaluation of computer-assisted multimedia instruction in intravenous injection. International Journal of Nursing Studies. 2004;41(2):191-198.
12. Sherriff K, Burston S, Wallis M. Effectiveness of a computer based medication calculation education and testing programme for nurses. Nurse Education Today. 2012;32(1):46-51.

Appendix

AWARENESS and KNOWLEDGE LEVEL ON HIGH ALERT MEDICATION (HAM)
Unit Pharmacy HOSPITAL KANOWIT (EXT : 236)

Ladies and gentleman,

This is a questionnaire prepared by pharmacy unit Hospital Kanowit for the purpose of finding out the awareness and knowledge level of HIGH ALERT MEDICATION among Staff Nurse(s) in Hospital Kanowit.I hope that all sister and staff nurse that involved can help to filled in this questionnaire on the spot before our programme today and return it to pharmacy unit by today as well.

Demographic Data:

1. Unit : _____

2. Sex (M/F):

3. Age :

4. Race:

5. Educational level

Master/P.H.D	☐	A-Level/STPM/DIPLOMA/Matriculasi	☐
Degree	☐	Others (eg post-basic on certain area please state it_____)	

6. Position:

Sister	☐
Staff Nurse/Matron	☐

7. Total years of services: _____

8. Have you ever heard of HIGH ALERT MEDICATION?

Yes (please answer question no. 9) ☐ No (please avoid question no. 9) ☐

9. From where or whom you heard of HIGH ALERT MEDICATION?

Medical staff(eg Medical officer/pharmacist) ☐
please state it:_____

Any Media(eg internet/Magazine) ☐
please state it:_____

Others ☐
Please state it:_____

Question:
Please fill in all the questions (boxes) with "T" for True or "F" for False

DEFINATION

1. What is the defination(s) of High alert Medication?

	T/F
Medications that is very expensive	
Medications that bear a highthened risk of causing significant patient harm when these medications use in error	
Medications that must request Director General approval	
Medications that only can be prescribe by Medical officer	

DILUTION PROTOCOLS & MEDICATION SAFETY:

2 Dilution of Adenosine is 6mg in 50CC of NS ☐

3. 10% KCl is better added to Ringer's solution for rapid infusion ☐

4. To use "U" instead of "unit" for dose expression ☐

5. The standard dilution of Digoxin is 2.5mg in 50 CC of NS ☐

6. If patient can tolerate, IV potassium can be administered orally instead of IV route ☐

7. When an emergency such as ventricular fibrillation happens, push fast 10%w/v KCl 10 ml into IV ☐

8. For pediatric dose, use teaspoon for dose expression ☐

9. IV Vitamin K can be given fast IV bolus ☐

10. Use “Amp” or “Vial” for dose expression instead of “mg” or “gm” ☐

11. Use distinctive labeling on look-alike drugs ☐

12. For convenience, heparin and insulin should be stored together in the refrigerator ☐

14. “cc” or “ml” is the dosage expression for insulin injection ☐

15.. Noradrenaline double strength dilution is 8mg in 50cc NS ☐

16. Adrenaline usual dilution is 3mg in 50cc NS ☐

17. Dopamine usual dilution is 250mg in 50cc NS ☐

18. Dobutamine usual dilution is 200 in 50cc NS ☐

19. IV Vitamin K need to be given at the rate not more than 1mg/min ☐

20. IV vitamin K can be given orally ☐

21. IV Magnesium Sulphate can be given orally with the help of filter straw ☐

CALCULATION:

22. Amiodarone dilution 600mg in 100cc D5W to run 25ml/hr for 2 hours, then follow by 6ml/hr for 22hours. The total mg of Amiodarone use a day is 1092mg

23. Patient body weight of 53kg, hypovolemic shock dose decided by doctor is 0.5mcg/kg/min, the dilution of Noradrenaline is 4mg in 50cc D5%, the rate of infusion is 19.9mg/hour

IDENTIFYING HIGH ALERT MEDICATION:

24. Is the following medications are High Alert Medication

Enoxaparin

IV Fentanyl

Streptokinase

Calcium Gluconate

Dextrose > 20%

HAM course Feedback form

Ladies and gentleman, this come to the end of this HAM course, we would like to get some feedback from all participants regarding the effectiveness of this course. Hope that, every participant will help to fill in this feedback form and give us your earnest opinion so that we can improve in the future.

Please marks us accordingly from number 1 till 10 for each sections asked below.

1=strongly disagree/negative, 10= strongly agree/positive

Do you find this course interesting?

1 2 3 4 5 6 7 8 9 10

After receiving this HAM course, do you think this is helpful in your daily routine work?

1 2 3 4 5 6 7 8 9 10

Will you be more confident in handling HAM after this?

1 2 3 4 5 6 7 8 9 10

Do you feel that this course should be held annually?

1 2 3 4 5 6 7 8 9 10

Please give your suggestion(s) to improve this course in the future.

_____
_____
_____
_____
_____
_____

END OF QUESTIONS THANK YOU FOR ANSWERING