

# INCREASING PERCENTAGE OF CORRECT MEDICATION ADMINISTRATION VIA NASOGASTRIC TUBE IN HOSPITAL KAJANG

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## 1. SELECTION OF OPPORTUNITIES FOR IMPROVEMENT

Prescribing medication incompatible with nasogastric tube (NGT) and administering medication incorrectly via NGT lead to lower therapeutic effect and increase risk of adverse events.<sup>1</sup> These subsequently increase morbidity, mortality<sup>2</sup> and hospitalization cost.<sup>1</sup>

### 1.1 PRIORITISATION OF PROBLEM

PROBLEM	S	M	A	R	T	SCORE
Low percentage of correct medication administration via NGT in Hospital Kajang	38	37	36	38	39	188
Poor timing of HAART medication administration in ward in Hospital Kajang	37	29	35	30	30	161
High percentage of discharged prescription after office hour in Hospital Kajang	29	30	32	31	38	160
High return of floor stock from ward in Hospital Kajang	24	28	26	34	36	148

SCORE	1	2	3	4	5
INDICATION	Very Low	Low	Fair	High	Very High

### 1.2 REASON FOR SELECTION

SERIOUSNESS
Low percentage of correct medication administration via NGT reduces medication effectiveness, increases adverse effects, causes various interactions, clogs feeding tube and possibly lead to mortality <sup>3,4</sup>
MEASURABLE
Percentage of correct medication administration via NGT can be measured
APPROPRIATENESS
Increasing percentage of correct medication administration via NGT can prevent compromising medication physicochemical and pharmacological. Thus, it ensures the treatment safety and efficacy <sup>1</sup>
REMIABLE
Integrated program with active involvement of a multidisciplinary team approach can contribute to substantial improvement <sup>5</sup>
TIMELINESS
This study can be completed within a short period of time

### 1.3 PROBLEM STATEMENT

**16th Feb 2019** (Therapeutic Range: 50-100mcg/mL)  
 A patient admitted due to breakthrough seizure. Crushed Tablet Sodium Valproate → TDM level Sodium Valproate **20mcg/mL** (sub-therapeutic)

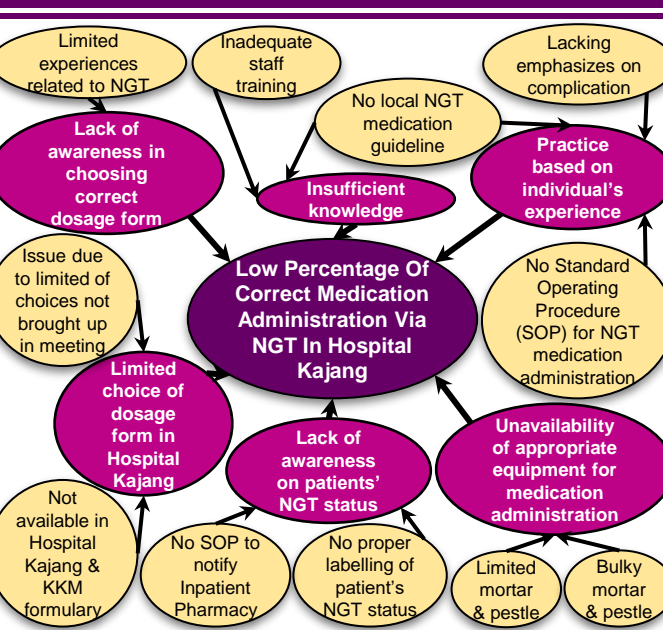
**22nd Feb 2019**  
 Changing to Syrup Sodium Valproate → TDM level Sodium Valproate **74mcg/mL** (within therapeutic)

2 weeks pilot study (1/7/2019-12/7/2019) was conducted in Hospital Kajang. **0%** medication was administered via NGT correctly.

### 1.4 LITERATURE REVIEW

A case reported that <b>crushing extended released</b> nifedipine and administered thru NGT leads to <b>mortality</b> as a because of severe hypotension. <sup>4</sup>	The <b>integrated program</b> consisted of doctor, nurse, pharmacist & dietician result in significant <b>improvement</b> in the number of administration error per nurse ( <b>24% to 93%</b> ). <sup>5</sup>	Crushing oral medication of narrow therapeutic window drugs alters pharmacokinetic and bioavailability, resulting in under dosing or adverse effects. <sup>6</sup>	<b>64%</b> of nurses stated that they had <b>not received enteral feeding training</b> and <b>81%</b> stated that there was <b>no written guideline</b> at their clinic. <sup>7</sup>
(Josh S 2003)	(Bemt 2006)	(Wright et al. 2006)	(Uysal 2016)

### 1.5 PROBLEM ANALYSIS CHART



### 1.6 TERM & DEFINITION

TERMS	DEFINITION
NASOGASTRIC TUBE (NGT)	Tube that are passed proximally from the nose or mouth distally into the stomach or small bowel for medication administration. <sup>8</sup>
CORRECT MEDICATION ADMINISTRATION	Administering the correct medication to the correct patient using the proper technique in accordance with Handbook of Drug Administration via Enteral Feeding Tubes. <sup>8,9</sup>

## 2. KEY MEASURES FOR IMPROVEMENT

### 2.1 OBJECTIVES

#### GENERAL OBJECTIVE

To increase percentage of correct medication administration via NGT in Hospital Kajang

#### SPECIFIC OBJECTIVE

- To determine percentage of correct medication administration via NGT in Hospital Kajang
- To identify factors contributing to low percentage of correct medication administration via NGT in Hospital Kajang
- To formulate strategies and to implement possible remedial actions
- To evaluate effectiveness of remedial measures implemented

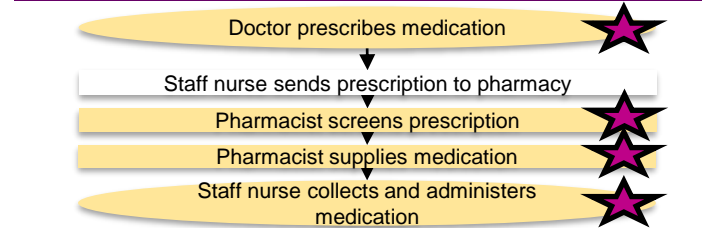
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## 2.2 INDICATOR & STANDARD

INDICATOR	
Percentage of correct medication administration via NGT in Hospital Kajang	
Total number of correct medications administer via NGT	X
Total number of medications administer via NGT	100%
STANDARD 100% Based on Malaysian Patient Safety Goals No.7: Guidelines on Implementation and Surveillance 2013	

## 2.3 PROCESS OF CARE



## 2.4 MODEL OF GOOD CARE

NO	PROCESS	CRITERIA	STANDARD	PRE-REMEDIAL	CYCLE 1	CYCLE 2
1.	Doctor prescribes medications	Prescribe medication based on NGT compatibility	100%	93.3%	94.8%	98.6%
2.	Pharmacist screens prescription	Screen prescription based on NGT compatibility	100%	0%	0%	100%
3.	Pharmacist supplies medication	Supply medication based on NGT compatibility	100%	0%	0%	100%
4.	Staff nurse collects and administers medication	4.1 Collect medication for the correct patient	100%	100%	100%	100%
		4.2 Prepare the medication separately	100%	0%	80%	100%
		4.3 Dilute the medication according to guideline	100%	91.9%	94.8%	98.6%
		4.4 Syringe out correct dose as per prescription	100%	100%	100%	100%
		4.5 Identify correct patient	100%	100%	100%	100%
		4.6 Serve medication compatible with NGT	100%	93.3%	94.8%	98.6%
		4.7 Flush the NGT tube before and after administration	100%	47.6%	69%	94.8%
		4.8 Serve medication separately	100%	0%	80%	100%
		4.9 Does not mix medication with feeding formula	100%	40%	72.9%	100%

## 3. PROCESS OF GATHERING INFORMATION

### 3.1 METHODOLOGY

STUDY DESIGN	Quasi-experimental
STUDY SETTING	Intensive Care Unit (ICU) Hospital Kajang
SAMPLING TECHNIQUE	Universal Sampling
STUDY PERIOD	Pre-Remedial: July 2019 – September 2019 Cycle 1: October 2019 – March 2020 Cycle 2: March 2020 – August 2020
INCLUSION CRITERIA	Medication administered via NGT
EXCLUSION CRITERIA	Incompatible NGT medication which the alternative is not available in Ministry of Health (MOH)

### 3.2 DATA COLLECTION TOOL

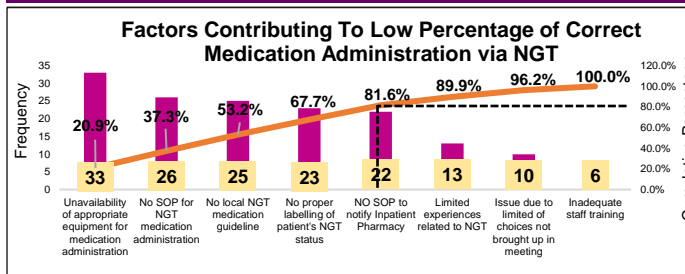
NO	TOOL	AIM	SUBJECT
1	Observational Audit Form	To determine percentage of correct medication administration via NGT	210 NGT medications administration in ICU
2	Self-Administered Validated Questionnaire	To assess the knowledge on NGT medication compatibility and administration steps contributing factors of the problems awareness on compatibility of medication for NGT patient	132 doctors, 20 staff nurses & 6 pharmacists in ICU

## 4. ANALYSIS AND INTERPRETATION

### 4.1 PRE-REMEDIAL STUDY

AUDIT FORM	QUESTIONNAIRE
Percentage of correct medication administration via NGT is <b>0%</b>	<p><b>Knowledge on NGT Medication, %</b></p> <p>Medication compatibility with NGT: 39.5                      Administration steps: 54.2</p> <p><b>46.9%</b> Mean score based on knowledge on NGT medication</p>
<b>NONE</b> medication administration via NGT fulfill the 9 steps correctly	<p><b>Awareness on Compatibility of Medication for NGT Patients, %</b></p> <p>Never pay attention: 5.1                      Seldom: 12.7                      Sometimes: 41.1                      Yes, Everytime: 41.1</p> <p><b>41.1%</b> respondents alert about NGT medication compatibility</p>
Oral medications were prepared and crushed together	

## 4.2 PARETO CHART



## 5. STRATEGY FOR CHANGE (NASOCARE INTEGRATED PROGRAM)

### Cycle 1 | 5.1 M&M (MINI & MULTIPLE) KIT

PROBLEM: NONE of NGT medication were prepared correctly because all were crushed together.

PRE-REMEDIAL	POST-REMEDIAL
 1. Bulky 2. Limited quantity	 1. Mini size at cheaper cost 2. 2 times faster NGT medication preparation 3. Convenient, easy to carry around in ward 4. Replicable

Reduced cross-contamination from sharing the same mortar and hence reduced drug residual, cost and time saving.

### Cycle 1 | 5.2 ESTABLISHMENT OF SOP

PROBLEM: Administration practice of NGT medication based on individual's experience

PRE-REMEDIAL	POST-REMEDIAL
1. Inappropriate dilution = 8.1% 2. Inappropriate flushing = 52.4% 3. Mixed with milk = 60%	

SOP with NGT medication administration steps was developed.

### Cycle 1 | 5.3 NASOMED GUIDELINE

PROBLEM: No local NGT medication guideline

PRE-REMEDIAL	POST-REMEDIAL
6.7% medications prescribed were not compatible with NGT	

NGT medication guideline with QR Code was developed.

### Cycle 2 | 5.4 NGT PINKCARD

PROBLEM: Low awareness on compatibility of medication for NGT patients

PRE-REMEDIAL	POST-REMEDIAL
58.9% respondents were not aware of NGT medication compatibility	

Patients were bedside tagged with NGT PinkCard to alert healthcare professionals.

### Cycle 2 | 5.5 DAILY NGT PATIENT LIST

PROBLEM: No SOP to notify Inpatient Pharmacy

PRE-REMEDIAL	POST-REMEDIAL
NONE prescription was screened and supplied based on NGT compatibility	

Inpatient pharmacists were notified on patient's NGT status.

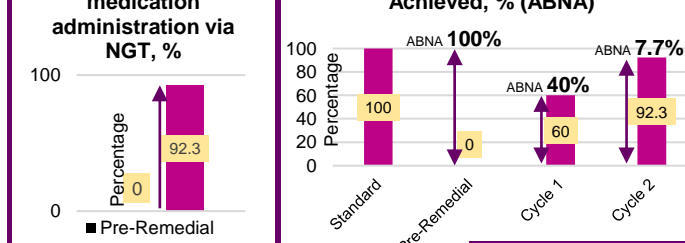
### 5.6 CUSTOMIZED COURSES

Staff Nurse Briefing	Dept.'s Weekly Assembly	Pharmacy Level Briefing
5	4	3

SESSIONS SESSIONS SESSIONS

- To introduce NASOCARE INTEGRATED PROGRAM
- Hands-on training
- Pre-Post Test
- Quiz with rewards

## 6. EFFECT OF CHANGE



**ACHIEVEMENT**

- The mean score of knowledge improved from **46.9%** to **82.3%**.
- The awareness on NGT medications compatibility increased from **41.4%** to **92%**.

**LESSON LEARNT**

- NASOCARE Integrated Program successfully increased the percentage of correct medication administration via NGT.
- These substantial improvements which warrant the treatment safety and efficacy, requires the active involvement of multidisciplinary team.

## 7. NEXT STEP

- To expand in all wards in Hospital Kajang and other MOH facilities
- To include the list of medications available in MOH to NASOMED guideline
- To develop reference guide and to educate patient, caretaker and nursing staff on medication administration via NGT at home

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