

A Study of the current Indent Process for developing standard operating procedure for Ambulances based on actual consumption.

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Introduction

- Established in 2005 by B. Ramalingam Raju, to create social equity and help the underprivileged.
- In May 2009, GV Krishna Reddy, founder and chairman, took over as chairman of EMRI.
- Successful operations in 14 States and 2 UT's.
- **Ambulances:** Total Number of Ambulances-Around 7000
 - GVK EMRI has developed its own ambulance design specifications.
 - ❖ Unique features meeting ergonomic and safety requirements.
 - ❖ Fully equipped with modern day medical and communication equipment.
 - ❖ Categories-Advanced Life Support
 - Basic Life Support
 - Rural Life Support

Three Contiguous Sectors

Sense

- Identification of the emergency and need for help at the community level.

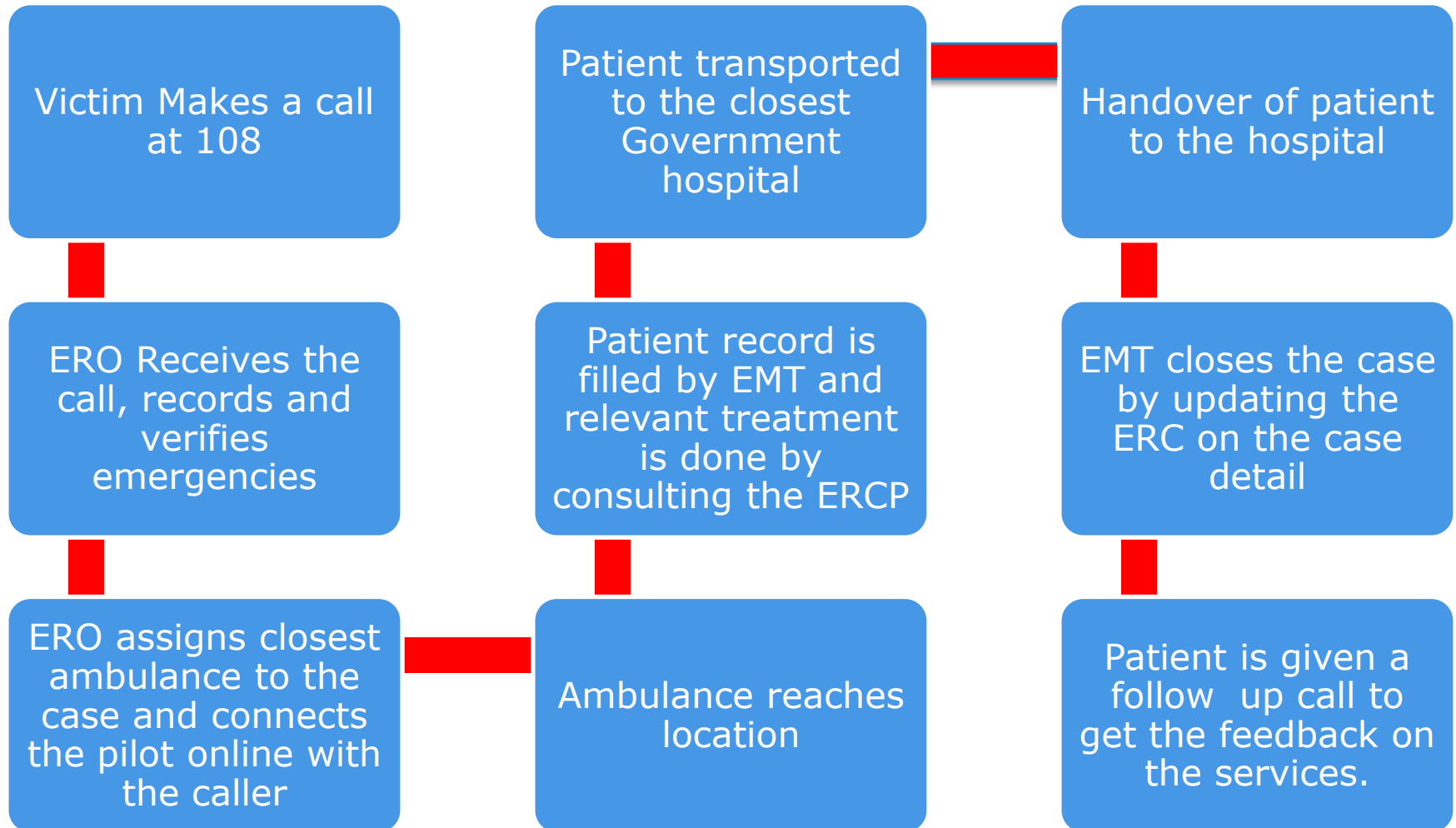
Reach

- Transport of the vehicle to reach the site in time.

Care

- Providing pre hospital care while transporting the victim to the hospital for stabilization.

Process



Rationale



- For the huge fleet of ambulances at GVK EMRI, the current system for providing medicines and medical consumables is based on the demand by the EMT (Emergency Medical Technician) of the ambulance and supply is done as per the indent generated by them. This process is reactive and thus results in long delivery time which might affect the quality (timely access to all medicines) of care provided. This current system has cost implications for the organization because of several reasons like-improper demand resulting in huge bulk of expired medicines, theft of medicines as the actual consumption is not monitored and no standard procedure for indent etc.

Objectives



- To study the current indent process in Meghalaya, Tamil Nadu and Andhra Pradesh at GVK EMRI.
- To analyze the gaps between the current indent procedure and standard indent procedure for ambulances services in the three states- Meghalaya, Tamil Nadu and Andhra Pradesh at GVK EMRI.
- To develop new standard indent procedure to address gaps between the current indent procedure and standard indent procedure for ambulances services and implementation of new standard indent procedure in three states

Methodology

- **Study design**

This study is an Analytical Study, where analysis of the current indent process is done to document the standard indent procedure and then Gap analysis is done for the current and standard indent procedure to formulate a new process of indent requisition.

- **Study Area**

The study area includes the indent process at the three states- Andhra Pradesh, Meghalaya, and Tamil Nadu.

- **Sample size**

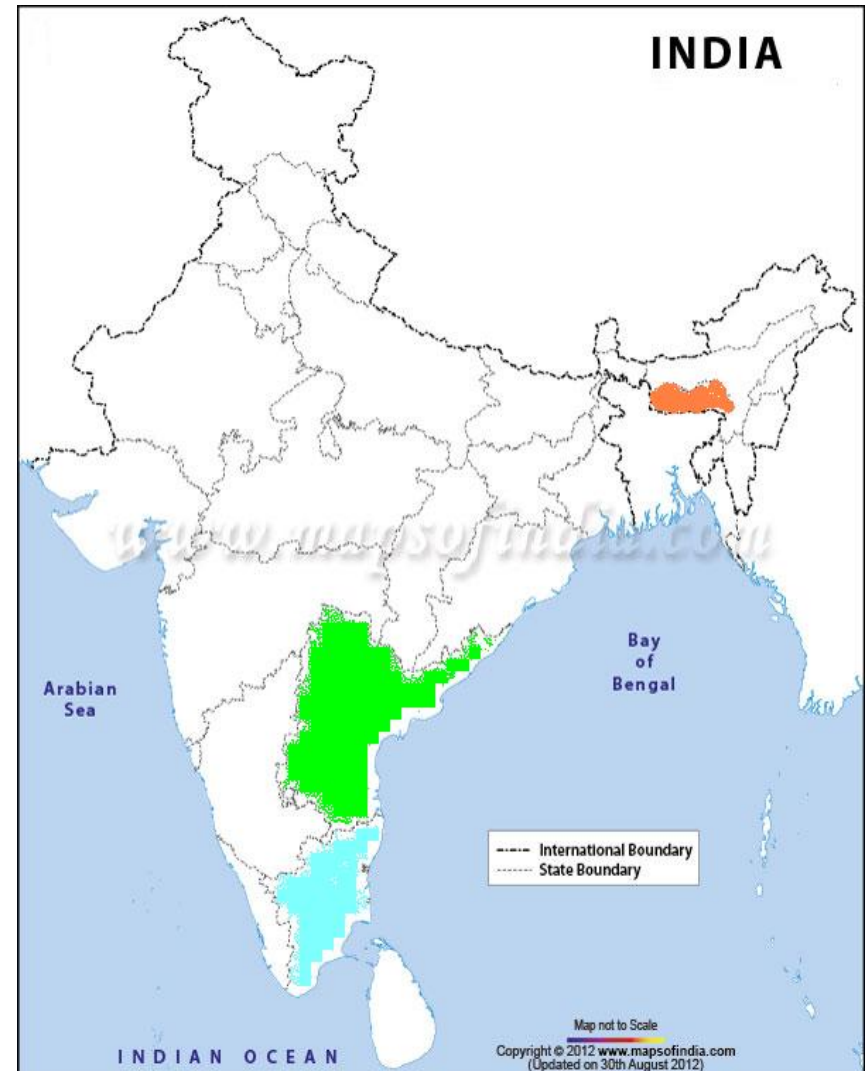
A total of 1399 ambulances in all the three states are operational out of them, 150 Ambulances were chosen for the study and 25 locations in Andhra Pradesh were identified for Primary data collection.

- **Sampling procedure**

Stratified Random Sampling was done to identify the sample. The sampling was done by defining the different regions (Strata) in each state and then the samples were randomly selected from each region

Sample States for Project

State	Total Ambulances	Operational Segments
Andhra Pradesh	802	752
Tamil Nadu	638	605
Meghalaya	47	42



- **Data collection**

- **Targeted on-** Consumption of Pharmacological Agents (medicines) and Disposable Medical equipments.
- **Data collection technique**
 - Qualitative data collection was done for information about- Current indent process for 150 ambulances operational in three states and List of Medicines and disposables used frequently based on the ambulance data.
 - Data collection was Observation based for the state of Andhra Pradesh where data was collected for 25 locations. For Tamil Nadu and Meghalaya the data was collected from the respective State Heads for Supply Chain Management.

➤ **Data collection tool**

A Checklist of all the essential medicines and pharmacological agents was used for data collection which is defined by the ambulance governing committee as the essential list of medicines for each ambulance at GVK EMRI.

➤ **Data Analysis**

Data entry and analysis for all the indents made in these three states in the last one year was done in Microsoft Excel

Project Focus

- The project was focus on the indent process of the following items:
 - Pharmacological Agents
 - Disposable Medical Equipment
- These items have been considered as the most important as these are being primarily used during pre hospital care. Proper monitoring and actual demand analysis from the Head Quarters itself will help us to reduce the wastage of these items as the cost incurred is the maximum for them.

Results and Discussion



- The Indent procedure in each state was based on similar indent formats but was not based on a standard operating procedure.
- For successful and efficient running of ambulance services, it is essential to have and follow Standard Operating Procedures that can direct all those involved in ambulance operations to perform and accomplish tasks with a greater degree of efficiency, economy and uniformity

Indent Process – Andhra Pradesh

EMTs send the closing stock to EMEs



EME verifies the closing stock, generates the indent and sends it to RM/PM for approval



After approval from RM/PM



Indent Request is sent to the stock room



Dispatch from the stock room to the ambulances

Indent Requisition And Stock Report- A.P



INDENT REQUISITION AND STOCK REPORT

Date of indent : 28.04.2014

Name of the Indentor :M Tirupathi

Designation :EMT

Ambulance Location :Anandapuram

District Name : Visakhapatnam

Vehicle Registration No: AP29 TA 3710

Vehicle Mobile No:9160995197

Vehicle Type : ALS/BLS/RLS

Preferred Delivery Address :Visakhapatnam

Available courier in locality :ANL/GMS

Indent Quantity = Max Stock – Closing Stock

Region Wise Schedules		
Region	Week	Dates
HYD	1 & 2	01 to 11
KDP	2 & 3	12 to 17
VZG	3 & 4	18 to 28

Format revised on 01st January'2012

S.No	Material ID	Material Description	UoM	Max. stock at Amby level (No's)	Closing stock at the time of ordering	Indent quantity
Pharmacological Agents (28)						
1	MA0001	Adrenaline Tartarate 1ml Injection	each	10	6	4
2	MA0004	Atropine Sulphate 1ml Injection	each	20	8	12
3	MA0005	Pheniramine Maleate 2ml Injection	each	10	10	0
4	MA0006	Buscopan 1ml injection	each	10	5	5
5	MA0011	Distilled water 5ml	each	10	6	4
6	MA0014	Furosemide 2ml Injection	each	10	10	0
7	MA0016	Paracetamol 2ml Injection	each	15	15	0
8	MA0017	Ranitidine Hydrochloride 2ml Injection	each	15	4	11
9	MA0020	Tramadol Hydrochloride 2ml Injection	each	10	0	10
10	MA0021	Ondansetron 2ml injection	each	10	10	0
11	MA0029	Magnesium Sulphate 2ml Injection	each	5	4	1
12	MA0039	Theophyllin 2ml injection	each	10	10	0
13	MA0078	Midazolam 5ml/5mg Injection	each	5	4	1
14	MV0004	Hydrocortisone 100mg Injection	each	5	3	2
15	MO/0005	Xylocaine Gel 2%	tube	2	0	2
16	MP/0001	Oral glucose 100grms	packet	5	1	4

Indent Process – Tamil Nadu

EMTs send the closing stock to EMEs



EME verifies the closing stock



After approval from the EME



Indent Request is sent to the stock room



Dispatch from the stock room to the ambulances

Indent Process – Tamil Nadu

- Indent generated on a **monthly basis**.
- **Dispatch Time** : 1 Week
- **Delivery Time** : 1 to 3 Days
- **Total time** : 8-10 Days
- Dispatch is done following **FIFO method**.

Indent Requisition And Stock Report- Tamil Nadu



AMBULANCE INDENT STATEMENT AND CONSUMPTION REPORT0

Ambulance Location & Diistrict	Pudhupettai Police Station & Cuddalore dist		
Despatch Address	108 Ambulance Services, Pudhupettai Police Station, Pudhupettai, Cuddalore dist		
Vehicle Registration No	TN30 G0156		
Mobile No	8754491083		
Vehicle Type	BLS		
Name of the EMT & GID No	P.Pauline Gracy/023481 & R. Sudhahar/023385		

Signature of the EMT	Indent Quantity = Max Stock – Closing Stock		
Name & Signature of the OE			

Previous Indent Date				Consumption Period (Number of Days)				
Current Indent Date		24.04.14						
Date of receipt of Indented Stock								
S.No:	Item Code	Item Description	Type of Ambulance	UoM	Maximum stock at Amby level (No's)	Minimum stock at Amby (No's) Quantity	Closing stock at the time of Indent /order	Indent quantity

Pharmacological Agents (48)

1	MA0001	Adrenaline 1ml Amp	BLS / CIFT/ NLS	Ampoule	10	10	o	10
2	MA0004	Atropine 1ml amp	BLS / CIFT/ NLS	Ampoule	10	10	o	10
3	MA0008	Diazepam 2ml Amp	BLS / CIFT/ NLS	Vial	15	15	o	15
4	MA0005	Pheniramine malate 2ml Amp	BLS / CIFT/ NLS	Ampoule	10	10	o	10
5	MA0014	Furosemide 2ml Amp	BLS / CIFT/ NLS	Vial	10	10	o	10
6	MA0016	Paracetamol 2ml Amp	BLS / CIFT/ NLS	Vial	20	20	o	20
7	MA0017	Ranitidine 2ml Amp	BLS / CIFT/ NLS	Vial	20	20	o	20
8	MA0020	Tramadol hydrochloride 2ml Amp	BLS / CIFT/ NLS	Vial	20	20	o	20
9	MR/0002	Salbutamol Respule 2.5ml	BLS / CIFT/ NLS	Respule	5	5	o	5
10	MR/0003	Budesonide Respule 0.1mg 2ml Amp	BLS / CIFT/ NLS	Respule	5	5	o	5
11	MR/0004	Salbutamol / Ipratropium bromide Respule 2.5 ml Amp	BLS / CIFT/ NLS	Respule	5	5	o	5
12	MA0025	Oxytocin Injection	BLS / CIFT/ NLS	Vial	5	5	o	5
13	MA0010	Diclofenac Sodium Injection	BLS / CIFT/ NLS	Vial	20	20	o	20
14	MA0029	Magnesium Sulphate Injection	BLS / CIFT/ NLS	Ampoule	5	5	o	5
15	MA0011	Distilled water 5ml Amp	BLS / CIFT/ NLS	Number	10	10	O	10
16	MT/0001	Activated charcoal 200mg - 6 Tablets per strip	BLS / CIFT/ NLS	Strip	1	1	o	1

Indent Process – Meghalaya

Call from State Head Quarters to take closing stock



EMT provides closing stock (Medical consumables, disposables and cleaning items)



Ideal quantity required per ambulance is set according to last month consumption



Categorize ambulances according to no. of cases handled last month



Indent request is sent to EME for verification & he verifies the closing stock



After approval from EME



Stock list is sent to stock room



Dispatch to all the ambulances

Indent Process – Meghalaya



- Indent generated on monthly basis.
- Dispatch Time : 7 Days
- Categorization of ambulances :
 - Category 1: 0 – 20 Cases
 - Category 2: 21 – 50 Cases
 - Category 3: >50 Cases

Indent Requisition And Stock Report- Meghalaya



A) The Total Valid Qty: EMT report to office over phone, which is monthly activity.

B) Ideal Qty: As per Category based on no of cases handled last month.

C) Approved Qty: The quantity we issue to base (B-A = C)

Monthly Stock Statement- Indent									
Date:									
Name of O.E :									
Location :						Registration No :			
District :									
No. of Cases Handled in Last Month :						Category :			
Vehicle Mobile No :									
Prepared By(Full name of EMT with signature) :									
Passed By (Signature with Date) :									
S.No.	Item Code	Item Description	UOM	Available Medicine Details	Total Valid Qty Available	Ideal Qty 1	Ideal Qty 2	Ideal Qty 3	Approved Qty
1	MA0001	Adrenaline	Ampule			2	3	5	
2	MR/0002	Asthalin	Ampule			5	5	5	
3	MA0004	Atropine	Ampule			2	5	5	
4	MA0005	Avil	Ampule			5	5	10	
5	MR/0003	Budecort	Ampule			3	3	5	
6	MA0076	Diclofenac sodium	Ampule			10	15	20	
7	MA0011	Distilled water	Ampule			10	10	10	

Ambulance Visit in Andhra Pradesh

- In order to standardize the procedure for indent requisition the secondary data was validated by field visits and collection of primary data from 25 locations in Andhra Pradesh.
- Prepared a list of frequently and rarely used Pharmacological Agents(Medicines) which are essential in the ambulance.
- Sample : 25 Ambulances within the reach.

Research Form

Frequently Used Medicines

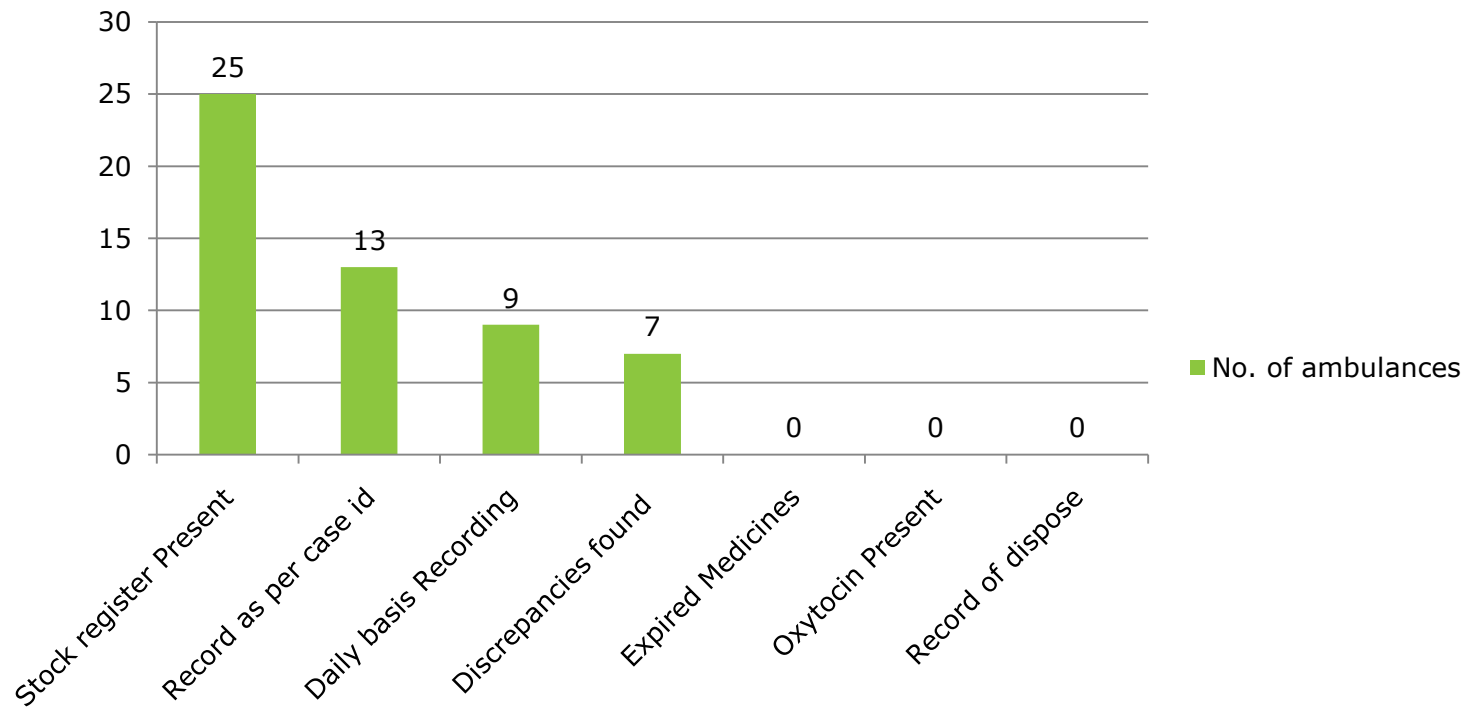
S. No.	Medicines	Form/ Use	Minimal Requirement	Stock Available	Difference	Expired Medicines
1	Oxytocin	Injectable	50 ampoules			
2	Aspirin Dispersible 325 mg	Tablet	30 tablets			
3	Isosorbidedinitrite 5mg	Tablet	30 tablets			
4	Clopidogril	Tablet	30 tablets			
5	Magnesium sulphate	Injectable	20 ampoules			
6	Budesonide	Respule	20 respules			
7	Salbutamol/ Pratriptium	Respule	20 respules			
8	Renitidine	Injectable	10 ampoules			
9	Paracetamol	Tablet	20 tablets			
10	Tramadol hydrochloride	Injectable	10 ampoules			
11	Dextrose 10%	Fluid	10			

Rarely Used Medicines

S. No.	Medicines	Form/ Use	Minimal Requirement	Stock Available	Difference	Expired Medicines
1	Midazolam	Injectable	4 vials			
2	Paracetamol	Syrup	1 bottle			
3	Furosemide	Injectable	5 ampoules			
4	Hydrocortisone	Injectable	5 of 2ml vials			

Observations

No. of ambulances



Observations

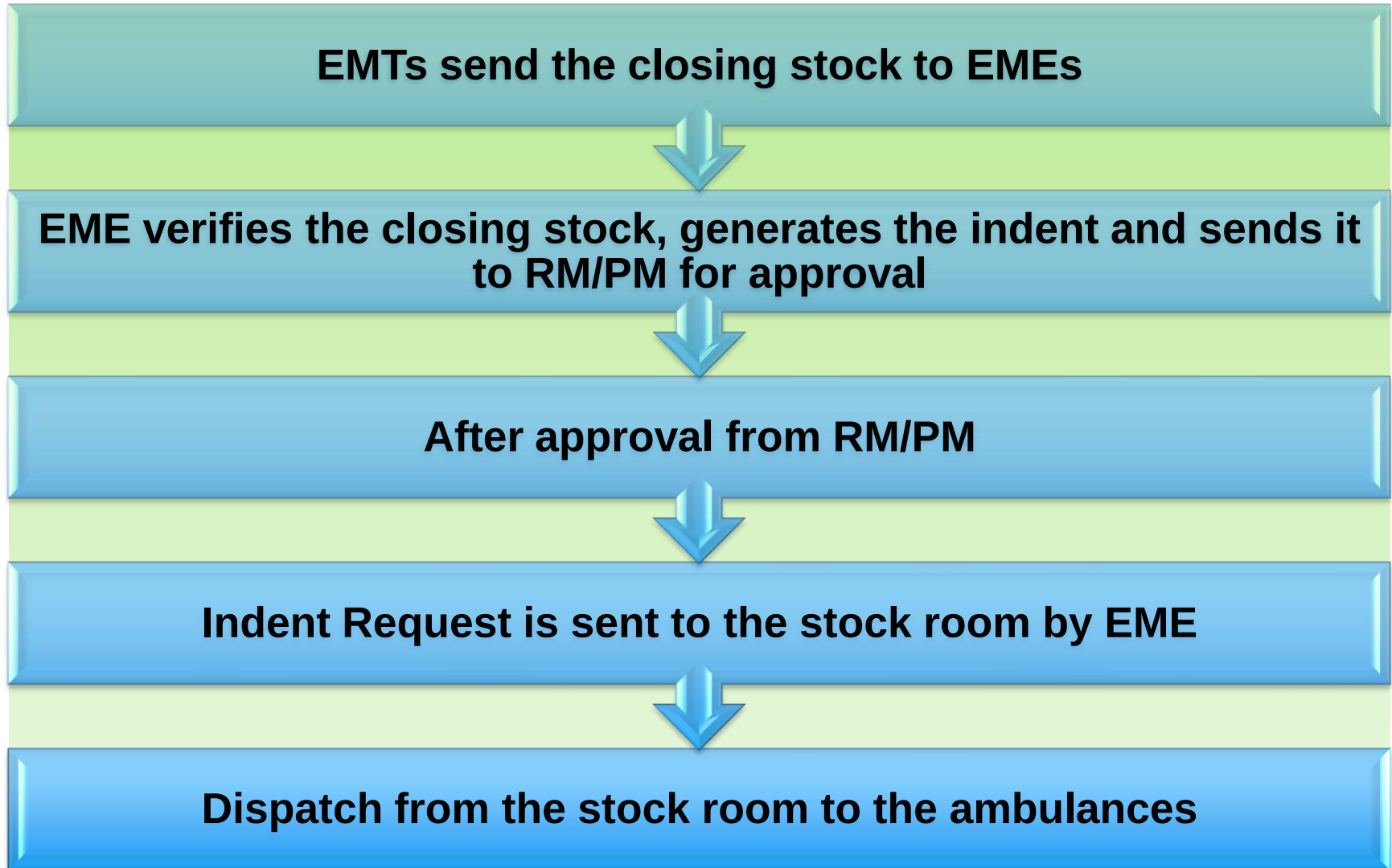
- Stock register was present in all ambulances. But only 13 out of 25 ambulances maintained the records as per the case ID.
- Nine ambulances maintained the record on daily basis where as others had not maintained it as per the standards.
- Discrepancies in the data entries of seven ambulances found for closing stock and actual stock available in the ambulance.
 - **E.g : Ranitidine**
 - As per closing stock 9 units but actually 19 units available.
- None of the ambulances had any expired medicines. In case any medicine is about to expire within 3 months it is sent back to Head Quarter and if any, then disposed off or sent to Gandhi Hospital. But as per standards expired medicines are to be sent back to the HQ or disposed at hospital with the consent of PM/RM.

Observations Cont.



- In case the ambulance crew is disposing off the medicines by themselves then there is no verification of the expired medicines & the count of disposed off medicines.
- Essential medicines like Oxytocin, not available in any of the ambulances. The number of pregnancy cases in A.P handled by the EMTs at site and in ambulances are around 500 per month.
- Meghalaya's indent form also includes medicines which are not present in the list provided by the ambulance committee.
 - For E.g : Avil, Duolin, Asthalin
- Some of the medicines present in the ambulances are not much in use.
 - For E.g : Maximum quantity of Adrenaline is 10 units despite of the cases being handled/ day but only one or two units are used in all the regions of AP.

Standard Indent Process- GVK EMRI



Push Pull System

Proposed

Push Process



Indent Release based
on forecast and actual
consumption

1. Acts Proactively
2. Keeps inventory to meet actual consumption

Current

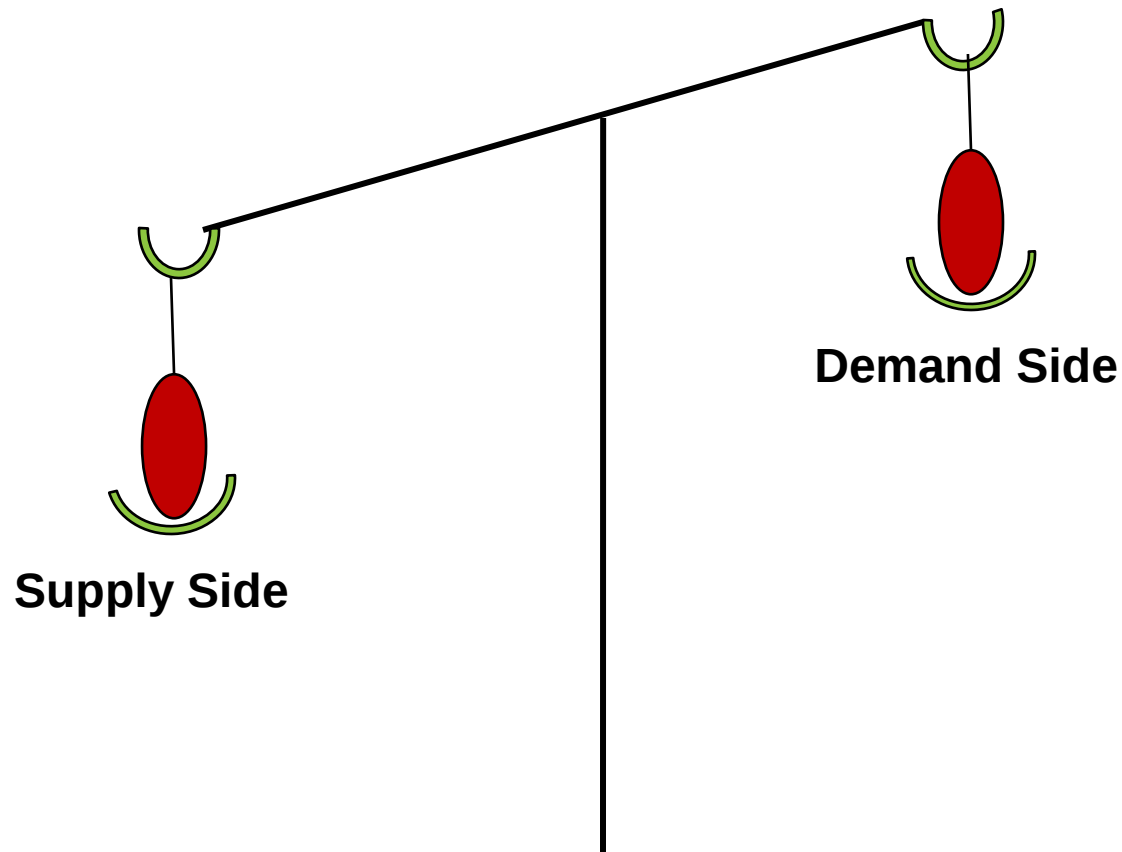
Pull Process



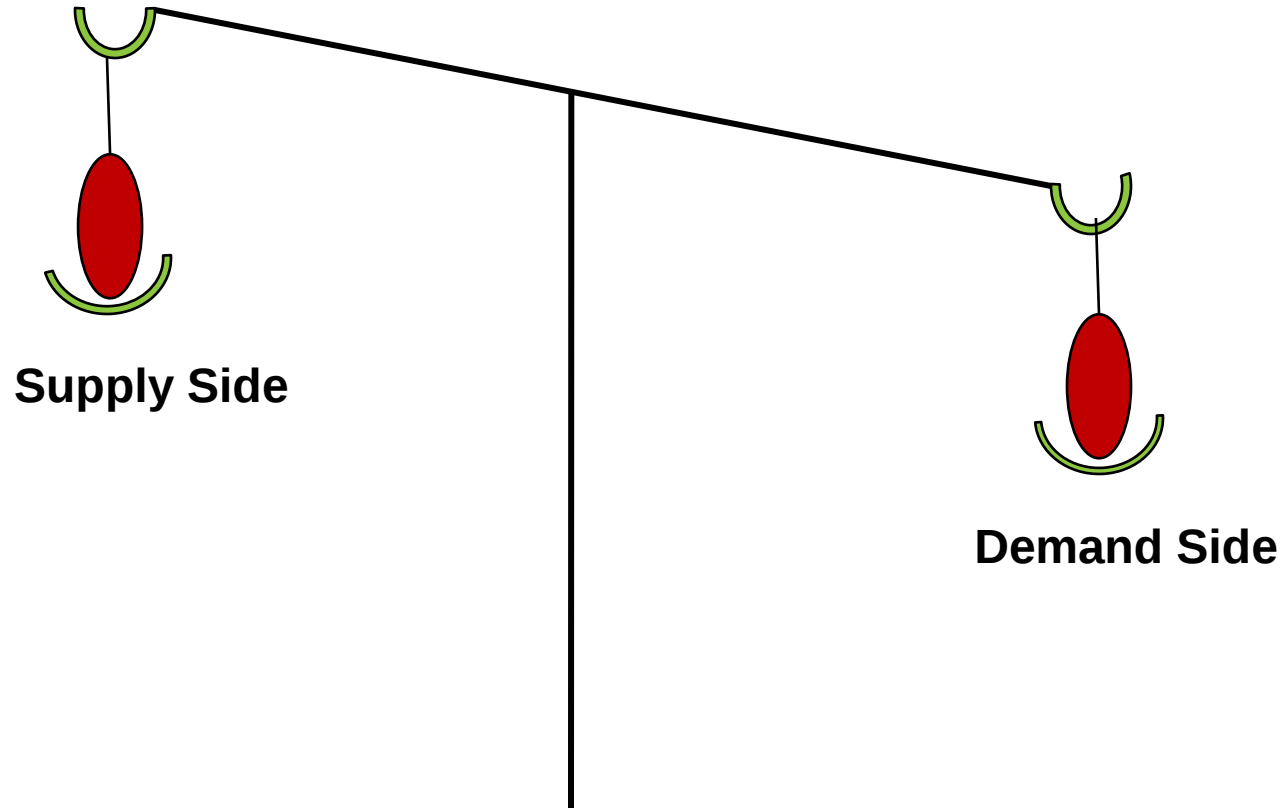
Indent Release based
on demand by EMTs

1. Acts Reactively
2. Cause long delivery lead times

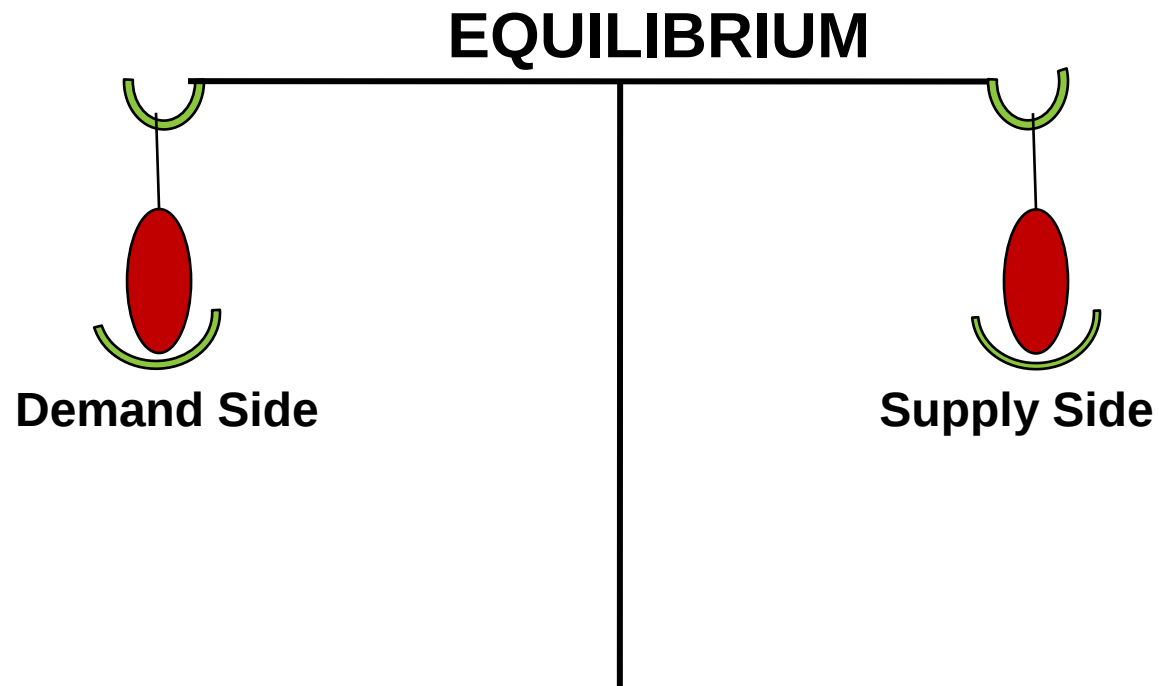
Presumed Scenario 1



Presumed Scenario 2



Presumed Scenario 3



Recommendations

Option 1



Closing Stock by using Case Closure Application:

Case closure application is a software based application for real time data collection.

During this case closure the ERC Communication Officer records real time data on various points like the type of emergency, medication given etc.

Currently the case closure process takes around 3 min approximately when observed for 50 cases in the ERC. This time extended only for 20 sec when the following details were added in an excel sheet format for testing.

The current case closure application could be extended including the following details :

1. Medicines/ Medical consumables Used
2. Form of Medicine (Injectable, Tablet etc.)
3. Quantity Used

These details will help in generating the closing stock which will be used at the time of indent generation.

- **Indent** = (Defined Maximum Quantity* – Closing Stock)

***Defined Maximum Quantity is the quantity mentioned in the indent form.**

Incident information - Call Waiting: 0

Incident id	20140009327777
Original Id	
Caller name	
Caller	9949289663
Contact Person	SARIF
PrefContNo	9949289663
PrefCallback	
Alt. Phone No.	
District	GUNTUR
Mandal	NARASAFACPETA
City/Village	NARASAFACPETA
Building no	
Road	
Landmark	REFER TO GUNTUR GGH
Locality	LOCAL
CO remarks	Medical Chief Complaint: Cardiac
Groups	M
C.Complaint	Cardiac
Co name	ASHOK KATURI
Dispatch time	05/05/2014 11:09:41
EGroup	
Subgroup	
Response mode	
Hand holding	With caller at scene
Edit Address	
Map point Play audio	
Save Close call	

Emergency Call

For assigning a victim to a vehicle or agency, double click the respective victim info (3 sec)						
Select	Victim id	Victim name	Age(Mo)	Gender	Remarks	
☒	1		0			

Victim details	
Victim id	1
Victim name	
Age (YY-MM)	
Gender	☐ Male ☐ Female
Remark	
Phone No	
Economic status	
Social status	
Trip id	1
Add Update Delete	

Destination Hospital	
Alternative mandals	NARASARAOPETA
Hospital name	
Alternative districts	GUNTUR
Phone	

Ambulance Details	
Price Details	
ERCAP Approval	
ERCAP Approval is Required	
Remarks	
Close	

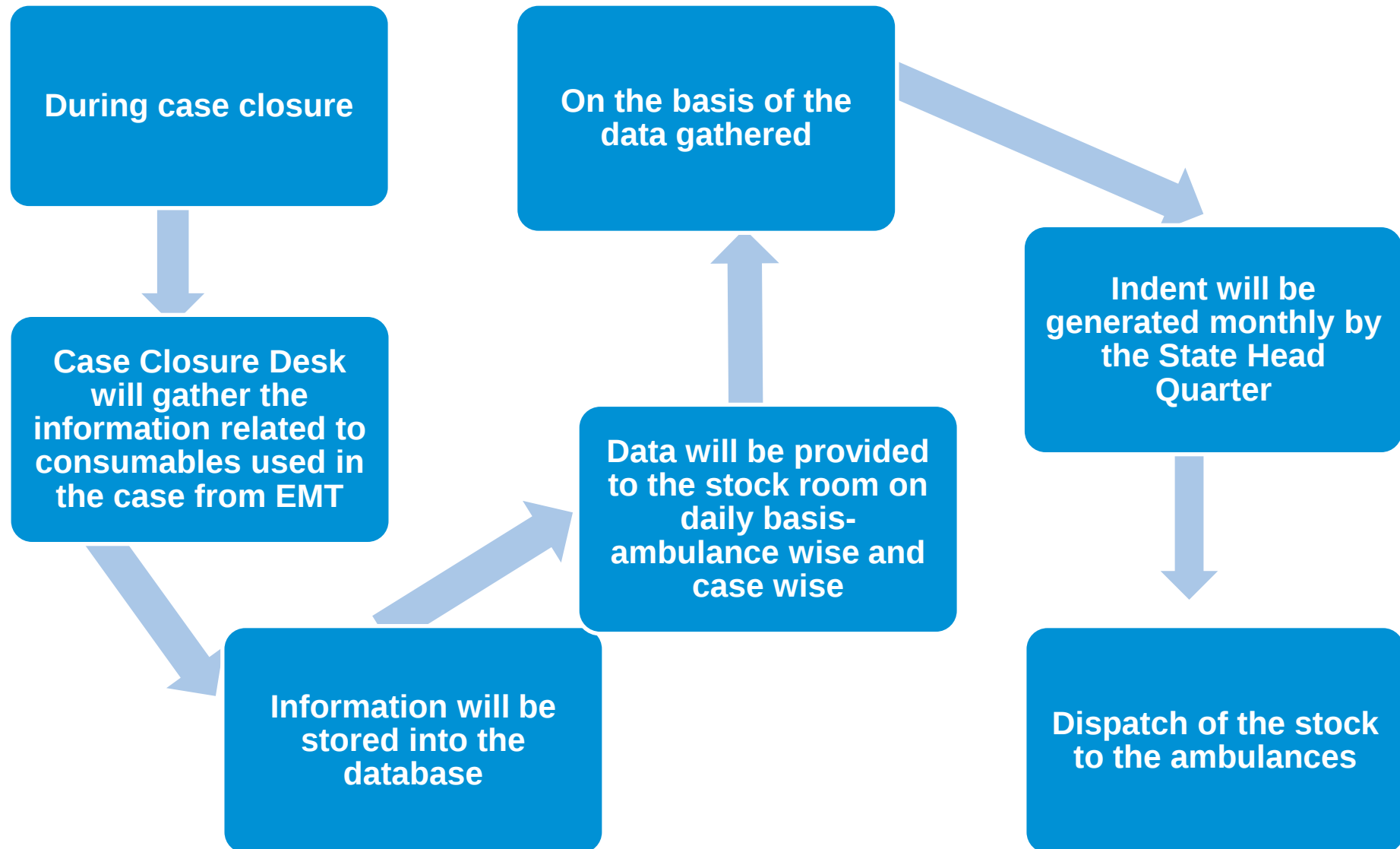
Vehicle and hospital details	
Alternative mandals	
Alternative districts	
Zone	NARASARAOPETA AP28TA3101 MARKET Y
CallBackDetails	Contact no: 9885930235
Assigned To	20140009345314
Status	Active
Assigned time	☒ 05/05/2014 11:10:40
Departure time	☒ 05/05/2014 11:11:40
Scene departure time	☐ 05/05/2014 15:32:12
Hospital 1 reach time	☐ 05/05/2014 15:32:12
Hospital 2 reach time	☐ 05/05/2014 15:32:12
Handover Time	☐ 05/05/2014 15:32:12
Back to Base time	☐ 05/05/2014 15:32:12
☒ Update Timings ☒ Vehicle De-assign ☒ Vehicle Assign	

Call closure remarks	
Dispatch status	
☐ Closed ☐ Unavailable dispatch ☐ Test case ☐ Vehicle not assigned	
☐ IFT case	
Source Hospital	
Alternative mandals	
Alternative districts	
Hospital name	
ERCAP ☐ Yes ☐ No	
ERCAP Conference # 0	
Select ERCP	
EMT Id	
☐ Critical case ☐ Exceptional case ☐ VIP	
Duration of Complaint 0	
Trip type Single	
Odo Meter Readings	
Base Start 65163	
Scene 0	
Destination 0	
Base Reach 0	
Emergency sub type:	
Stancarc remarks:	
Other remarks:	
Geo Limit	
Base to scene -651	
Scene to hospital 0	
GIS Data(km) Not Available	

Process For Disposables

- Products like nasal cannula and airways can be counted case wise and thus the details will be collected at the time of case closure.
- Products like gloves can be provided in the quantity derived by the formula:
No. of gloves= No. of cases handled last month * 1.25
- Products like disposable syringes and cannula can be estimated by the records of the injections and fluids used.
 - **No. of syringes = No. of injectables * 1.25**
- For other products we will provide the maximum quantity of disposable items to the ambulances.
- At the time of visit by quality team, the actual available quantity of the items whose indent is fixed will be checked.
- Depending upon the available quantity of disposables (fixed items) the further stock will be made available to the ambulances.

Indent Generation through Case Closure Application

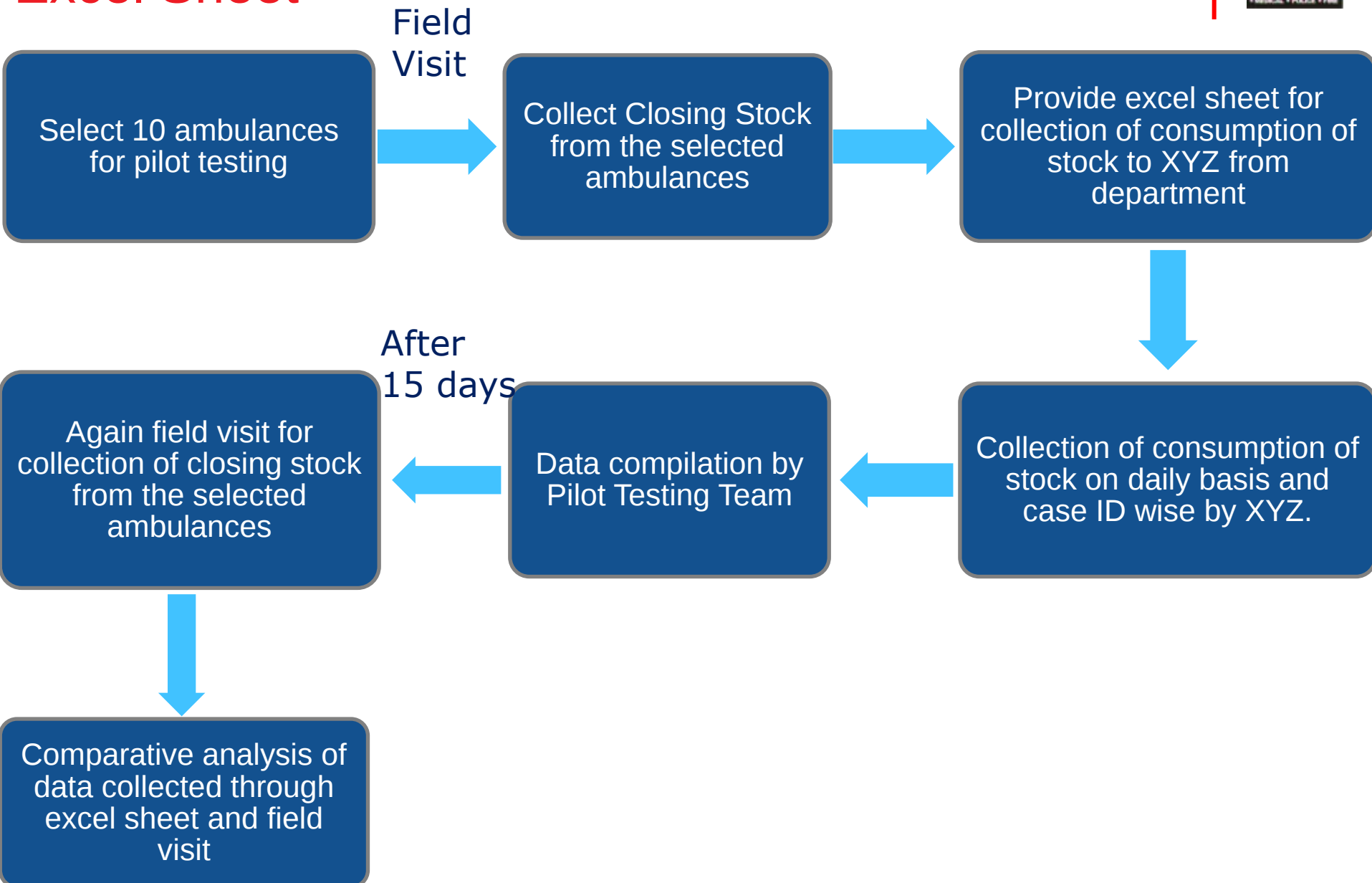


Advantages of Proposed Process Over Current Process



- Quality enhancement.
- Wastage of the medicines and medical consumables will be reduced.
- Authenticity of the closing stock will increase.
- Step including the EMT, EME & RM/ PM verification will be bypassed thus the process will be fast.
- Redundancy of the process will be reduced.
- Smooth information flow.
- Providing appropriate stock to all the ambulances.
- Procurement of only the required stock in the stock room.
- Monitoring of the ambulance stock will be regular.
- This process can be implemented throughout the country irrespective of the terrain & connectivity.

Flow of Pilot Study Process – Excel Sheet



Option 2

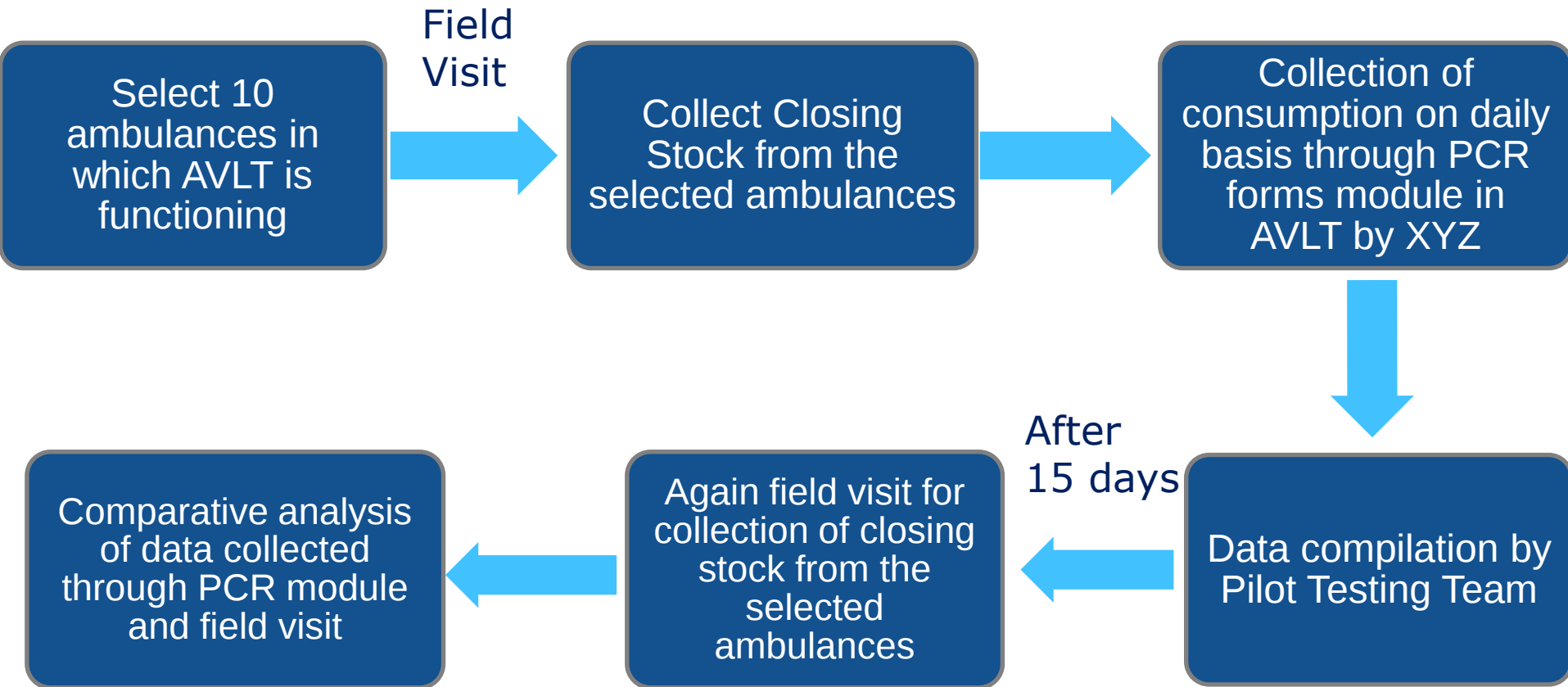
AVLT Device



- Automated Vehicle Location Tracker
- AVLT is currently used only for tracking the ambulances and for biometric attendance.
- Currently has three modules – PCR, Fleet and SCM
- Only PCR module is integrated with the database
- Along with the details pertaining to the case, PCR module covers the details and quantity of the medicines and medical consumables used.

- The PCR records can be used to generate closing stock as the records will be maintained case ID wise.
- Real time data will be available.

Flow of Pilot Study Process - AVLT



Limitations for AVL T for Indent

- All the ambulances are not equipped with AVL T system in any of the state.
- Those ambulances where AVL T is present it is not functional all the time.
- AVL T poses a drawback of loss of connectivity.
- Integration of all the functions of the AVL T System is still in progress.
- Hence the data can not be collected on a regular basis for Indent through AVL T.

Conclusion

Gaps

- The current process has many levels thus increasing the time for indent generation. There are three levels at the demand side i.e. closing stock by EMT, verification by EME, and approval from RM/PM. Thus the process is redundant.
- Current process poses many responsibilities for the EMEs which increases their work load which may affect the authenticity of the indent request.
- There were some discrepancies in the closing stock and the actual stock.

- The new indent procedure based on case closure application has been accepted by the organization for adaptation for all 14 states and 2 Union Territories after successful completion of the pilot testing.
- Pilot study has been initiated and primary data is collected for 8 ambulances in the state of Andhra Pradesh till now.
- This study is an ongoing project and hence the organization has not permitted to disclose the data details.

Thank You