NAVAL HEALTH RESEARCH CENTER

THE RESUPPLY VALIDATION PROGRAM (RSVP): A SYSTEMS REPORT

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The ReSupply Validation Program (RSVP):
A Systems Report

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The ReSupply Validation Program (RSVP): A Systems Report

Introduction

The United States Marine Corps (USMC) has changed its doctrine and policy to achieve more flexible and effective combat operations. To accomplish this goal (as expressed in Operational Maneuver From the Sea), Concept of Naval Force Protection for the 21st Century, Joint Vision 2020, Marine Corps Strategy 21, and Sea Power 21 illustrate the need for highly mobile medical units with improved responsiveness.[1-5] The success of such units is impossible without the development of more modular, flexible, and efficient Authorized Medical Allowance List/Authorized Dental Allowance List (AMAL/ADAL) configurations that match the speed and mobility of USMC contingency response operations.

The development of such streamlined AMALs/ADALs requires improvement in the medical resupply process. Currently, USMC is sustained with preconfigured AMALs/ADALs: when some of the supplies within an AMAL are exhausted, the entire block is resupplied rather than only those items that have been depleted. This process assumes the same consumption rate for each line item in the block. When in theater, consumption rates vary significantly depending on the patient stream. As a result, USMC unnecessarily expends resources in the form of supply overstock as well as in storing, maintenance, and transportation of these additional supplies.

To streamline the resupply process, the Naval Health Research Center (NHRC) expanded the Estimating Supplies Program (ESP), a program that estimates the supplies required to treat a particular patient stream, into a tool called the ReSupply Validation Program (RSVP). RSVP is a software program designed for Navy and Marine Corps planners and logisticians as (1) a simulation tool that models the delivery and consumption of a medical supply inventory over a series of time intervals, and (2) a research tool that can help determine the optimal configuration and delivery schedule of medical supplies for any type of operation. RSVP links the resupply process to the demands of the patient stream, providing

users with the ability to tailor their resupply to meet the needs of a specific mission.

This document explains what RSVP does, how it works, and why it is useful for the medical planning and logistics communities.

Background

In the 1990s, NHRC designed the supply review model that established a valid configuration for a single AMAL/ADAL by mapping patient conditions (PCs) to medical tasks to the individual supplies needed to perform those task.[6-15] USMC requested that NHRC use this same process to determine the total materiel requirement for a defined patient stream, this time mapping the quantity of PCs to the individual supply item quantities.

NHRC first evaluated how the current AMAL configurations served a user-defined patient stream. NHRC developed a patient stream using ESP, which incorporated patient probabilities from the ground casualty projection system FORECAS. Eight thousand three hundred and thirty-one patients (the notional number of patients for which the current AMALs are configured) were entered into ESP and distributed over 350 PCs. ESP then generated the consumable supplies and equipment necessary for treating these patients. The analysis showed that the consumption rates of each item in the AMAL vary significantly. In fact, current inventory levels of approximately 70% of the consumable supply items exceeded the actual requirements of the defined patient stream.

After discovering the excess in the original AMAL configuration, NHRC proposed to simulate the consumption of an ESP-generated inventory that was linked to a patient stream. The goal was to assess whether the necessary items and quantities were available to treat patients as they arrived into the health care system. To achieve this goal, several capabilities were incorporated into ESP: the ability to time phase the patient stream and inventory, the ability to decrement supply quantities from an inventory as they were used, and an expanded selection of reports. NHRC named the new program RSVP to acknowledge its new functionality. The results of the simulation showed that the RSVP time-phased inventory would be successful in

treating the patient stream while at the same time reducing supply overstock and, therefore, the resources required to store, maintain, and transport that overstock.

For a detailed description of the development of RSVP from ESP, see NHRC Technical Report 03-18, "The ReSupply Validation Program (RSVP): Developing ESP Into a Tool That Validates Patient-Driven Fleet Marine Force Medical Resource Requirements." [16]

Description of RSVP

Underlying Data

Because RSVP was developed from ESP, the two programs share the same database and are installed at the same time. For RSVP to run properly, the most current version of ESP must also be installed on the same machine. When using RSVP, users select scenarios that were generated in ESP, either preestablished ones or ones they created themselves.

RSVP offers the following levels of care and their respective functional areas (FAs): First Responder, Battalion Aid Station (BAS), Forward Resuscitative Surgery System (FRSS), Surgical Company (SC), En Route Care, Small Ships/Independent Duty Corpsman, Landing Ship Dock/General Medical Officer, and Preventive Medicine. RSVP also has the treatment briefs developed by the Joint Readiness Clinical Advisory Board.

RSVP has two primary functions: to create an inventory and simulate its use. The user enters scenario parameters and RSVP calculates supplies according to stochastic principles, which means it generates inventories by randomly choosing the arrival times and PCs of each patient. Once it creates the patient stream, RSVP identifies supplies consumed by those patients, then, over time, decrements the quantity of each item from the supply block. The user can see which supplies will last throughout the scenario.

These two functions, Inventory Generation and the Consumption Simulator, are explained in greater detail below.

Inventory Generation

The Inventory Generation function is used to generate and schedule the delivery of a resupply inventory based on the arrival of the patient stream. This function has three screens, each with its own tab: Scenario, Functional Area Laydown, and Generate Inventory.

Scenario Screen

In the Scenario screen, the user enters the following parameters to define the scenario: the number of patients, the number of days in theater, and the number of resupply periods (see Figure 1).

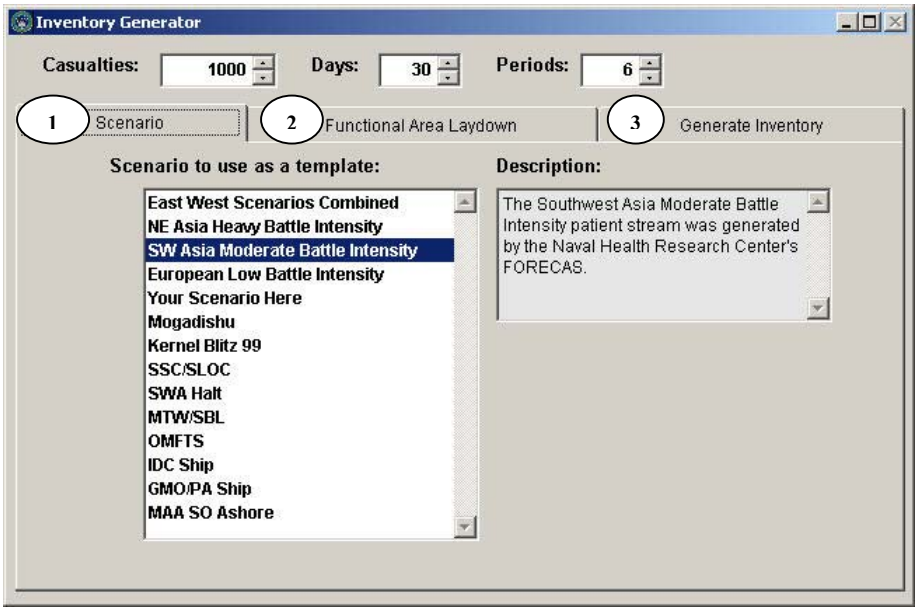

Figure 1. The Scenario screen.

Next, the user selects a scenario. The scenario, as previously mentioned, is originally built in ESP where the user selects the levels of care, the FAs, and the PCs those functional areas are expected to treat. Therefore, the scenario the user selects in RSVP determines the FAs for which the inventory is built as well as the types of patient stream the inventory is suited to treat.

Functional Area Laydown Screen

Next the user clicks the Functional Area Laydown tab to select the FAs for the scenario (see Figure 2). The list of FAs are those that were selected when the user

built the scenario in ESP. The user specifies how many of each FA to supply. At least one FA must be selected to execute RSVP.

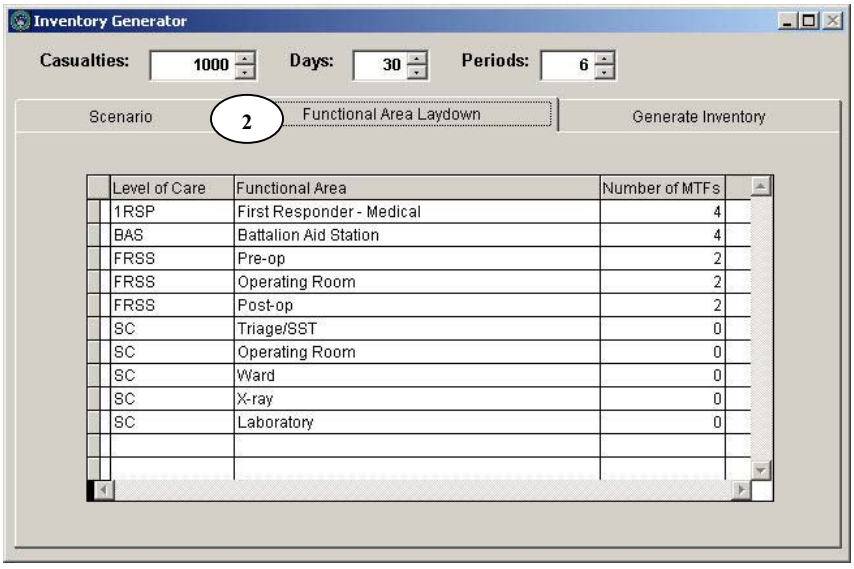

Figure 2. The Functional Area Laydown screen.

Generate Inventory Screen

The user then clicks the Generate Inventory tab. In this screen, the user enters the number of days in each period and the percentage of casualties expected to arrive during each period. Once the days and percentages are entered, RSVP creates a bar graph to display the percentage of patients expected to occur in each period.

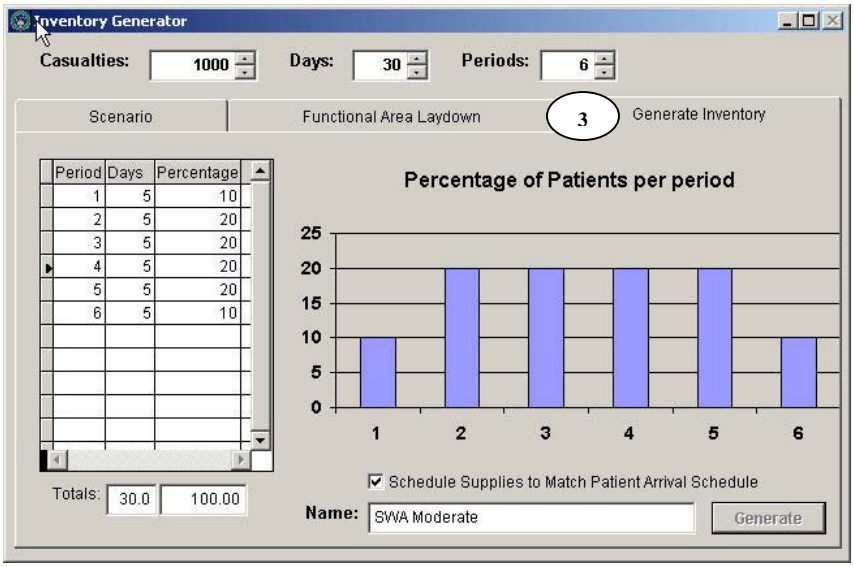

Figure 3. The Generate Inventory screen.

This feature allows the user to model supply delivery while taking into account mission constraints. Based on the knowledge of the type of operation, the location, the terrain, the number and types of available transportation assets, and storage capabilities, the user can adjust how much of the inventory arrives during each period. RSVP uses these percentages to divide the inventory into shipments: if 10% of the casualties are expected in period 1, then 10% of the inventory is sent at the beginning of the period. The user can change the period days and percentages, which in turn changes the bar graph upon leaving the grid.

Once the user types in the inventory Name and clicks the Generate button in the Generate Inventory screen, RSVP generates 100 stochastic iterations of the patient stream. For each iteration, RSVP generates a patient stream based on the percentages of occurrence in the scenario.

Next, each PC's iterations are ordered on patient quantity from highest to lowest. The 80th percentile quantity is chosen for each PC. Then, RSVP identifies the quantity that matches the 80th percentile, aggregates the patient stream, and generates the supplies to treat those patients.

For example, Figure 4 shows 5 iterations of a patient stream. PC 001 appears 2 times in the first iteration, 1 in the second, 4 in the third, 3 in the fourth, and 1 in the fifth. These quantities are then rank ordered. The 80th percentile, which is 3, would be used to generate the supplies to treat that PC.

Sample Patient Stream

Iteration	PC 001	PC 002	PC 003
1	2	1	3
2	1	2	1
3	4	0	4
4	3	0	0
5	1	1	1

Rank-Ordered Sample Patient Stream

Percentile	PC 001	PC 002	PC 003
100	4	2	4
80	**3**	**1**	**3**
60	2	1	1
40	1	1	1
20	1	0	0

Figure 4. Sample Iterations of a Patient Stream.

Inventory Reports

RSVP generates 7 inventory reports, some of which detail elements of the scenario and patient stream, and others that are concerned principally with supplies.

The scenario and patient description reports are:

- Scenario Description
- Patient Stream by Category
- Patient Stream

The reports detailing lists of supplies for the patient stream are:

- Total Calculated Supply Requirements – Units of Measure
- Time-Phased ReSupply Sorted by Functional Area Then Supply
- Time-Phased ReSupply Sorted by Supply Then Functional Area
- Time-Phased ReSupply Sorted by Supply Totaled Across Functional Area – Unit of Issue

The Scenario Description report (see Figure 5) lists the user inputs for the scenario: the name, the selected FAs, the first and last day of each period, and the total number of patients divided into the number of periods. This report is useful for seeing the user inputs at a glance.

Scenario Description

Supply List: SWA Moderate
Number of days: 30 **Number of runs:** 100 **Percentile:** 80

Based on Scenario: SW Asia Moderate Battle Intensity
The Southwest Asia Moderate Battle Intensity patient stream was generated by the Naval Health Research Center's FORECAS.

Functional Areas: 4 1RSP First Responder - Medical, 4 BAS Battalion Aid Station, 2 FRSS Pre-op, 2 FRSS Operating Room, 2 FRSS Post-op

Period	First day	Last day	Patients
1	1	5	100
2	6	10	200
3	11	15	200
4	16	20	200
5	21	25	200
6	26	30	100
	Total Patients:		1000

Figure 5. The Scenario Description report.

Patients by Category

Inventory: SWA Moderate

Category	Number of Patients
Abdomen & Pelvis	65
Battle Fatigue	220
Burns	62
Cardiovascular	19
Directed Energy Weapon Eye Lesion	15
Environmental	19
Eye/Ear Disease	35
Gastrointestinal	109
General	2
Genitourinary	52
Head	125
Infectious/Parasitic	70
Lower Limbs	215
Multiple Injury Wounds	245
Miscellaneous	13
Neuropsychiatric	43
Not Assigned	10
Respiratory	75
Sexually Transmitted Disease	8
Spine	21
Sprains & Strains	91
Superficial/Soft Tissue	325
Surgical	62
Thorax	19
Upper Limbs	243
Dermatological	91
Total	2254

Figure 6. Patient Stream by Category report.

The Patient Stream by Category report (see Figure 6) lists the number of patients within each patient category. The patient categories are those defined by the Joint Readiness Clinical Advisory Board. This report is useful for seeing the frequency of occurrence by types of patients.

The Patient Stream report (see Figure 7) lists the patients in order by PC code. This report is useful for identifying whether a particular PC is in the scenario.

Patient Stream used for Calculations

Inventory: SWA Moderate

Patient Condition		Number of Patients
1	CEREBRAL CONCUSSION CLOSED WITH/WITHOUT NONDEPRESSED LINEAR SKULL FRACTURE SEVERE - LOSS OF CONSCIOUSNESS FROM 2 TO 12 HOURS	6
2	CEREBRAL CONCUSSION CLOSED WITH/WITHOUT NONDEPRESSED LINEAR SKULL FRACTURE MODERATE - LOSS OF CONSCIOUSNESS LESS THAN 2 HOURS	16
3	CEREBRAL CONTUSION CLOSED WITH/WITHOUT NONDEPRESSED LINEAR SKULL FRACTURE SEVERE - LOSS OF CONSCIOUSNESS GREATER THAN 24 HOURS WITH FOCAL NEUROLOGICAL DEFICIT	2
4	CEREBRAL CONTUSION CLOSED WITH/WITHOUT NONDEPRESSED LINEAR SKULL FRACTURE MODERATE - LOSS OF CONSCIOUSNESS FROM 12-24 HOURS WITHOUT FOCAL NEUROLOGICAL DEFICIT	6
5	CEREBRAL CONTUSION CLOSED WITH INTRACRANIAL HEMATOMA WITH/WITHOUT NON- DEPRESSED LINEAR SKULL FRACTURE - SEVERE - LARGE HEMATOMA (INCLUDING EPIDURAL HEMATOMA) WITH RAPIDLY DETERIORATING COMATOSE PATIENT	4
6	CEREBRAL CONTUSION CLOSED WITH NONDEPRESSED LINEAR SKULL FACTURE SEVERE - LOSS OF CONSCIOUSNESS GREATER THAN 24 HOURS WITH/WITHOUT FOCAL NEUROLOGICAL DEFICIT	3
7	CEREBRAL CONTUSION CLOSED WITH DEPRESSED SKULL FRACTURE SEVERE - WITH ASSOCIATED INTRACEREBRAL HEMATOMA AND/OR MASSIVE DEPRESSION	3
8	CEREBRAL CONTUSION CLOSED WITH DEPRESSED SKULL FRACTURE MODERATE - NO ASSOCIATED HEMATOMA OR SIGNIFICANT EFFECT FROM DEPRESSION	2
9	CEREBRAL CONTUSION WITH OPEN SKULL FRACTURE SEVERE - WITH INTRACRANIAL FRAGMENTS AND/OR DEPRESSED SKULL FRACTURE; EYELID AND EYEBALL LACERATION WITH RETAINED INTRAOCULAR FOREIGN BODY	8
10	CEREBRAL CONTUSION WITH OPEN SKULL FRACTURE MODERATE - WITHOUT INTRACRANIAL FRAGMENTS AND/OR DEPRESSED SKULL FRACTURE	7
13	WOUND SCALP OPEN WITHOUT CEREBRAL INJURY OR SKULL FRACTURE SEVERE - SCALPED WITH AVULSION OF TISSUE	18
14	WOUND SCALP OPEN WITHOUT CEREBRAL INJURY OR SKULL FRACTURE MODERATE - SCALP LACERATION	17
15	FRACTURE FACIAL BONES CLOSED EXCLUSIVE OF MANDIBLE SEVERE - MULTIPLE FRACTURES	3

Figure 7. Patient Stream report.

The Total Calculated by Supply Requirements report (see Figure 8) is an alphabetical list of supplies for the given patient stream. The supplies are grouped by FA and includes the National Stock Number (NSN), supply nomen, and unit of measure (UM) quantity. This is useful for viewing the total supply needs for each FA.

Calculated Supplies for SWA Moderate

1RSP First Responder - Medical

Set: Non Set Supplies

Nsn	Nomen	UM Qty
6505009857301	ACETAMINOPHEN TABLETS 0.325GM 1000S	2278.0000
6510002036010	ADHESIVE TAPE SURG 12INx5YDS MOLESKIN	0.0000
6515011676637	AIRWAY NASOPHARYNGEAL ROBERTAZZI 30FR 12S	10.8000
6515009582232	AIRWAY PHARYNGEAL BERMAN DESIGN 80MM 12S	54.0000
6515011649637	AIRWAY PHARYNGEAL CUT AWAY FLANGE 30FR 30S	43.2000
6505014731770	ALUMINUM MAGNESIUM TABS 100S	467.0000
6510012787002	APPLICATOR IMPREG w/BENZOIN 4IN LG 500S	16.0000
6515009051473	APPLICATOR PLASTIC/WOOD ROD 6IN LG 2000S	192.5000
6505001009985	ASPIRIN TABS .32GM 100S (ACLS protocol only)	7.0000
6510009137909	BANDAGE ADHESIVE FLESH 3x.75IN 300S	17.0000
6510001055807	BANDAGE ELASTIC COBAN FLESH 3" X 5YD 24S	438.5000
6510009355823	BANDAGE ELASTIC ROLLED ACE 6INx4.5YDS 12S	192.7500
6510000583047	BANDAGE GAUZE KERLIX 4.5IN x 4YDS 100S	2517.1500
6510002011755	BANDAGE MUSLIN CAMOUFLAGE 37x37x52IN 1S	440.2500
6505014213787	BENZOCAINE MENTH CETYLPYRD LOZENGES 648S	144.0000
6505014437607	BISMUTH SUBSALICYLATE TABLETS CHEWABLE 30S	920.0000
6515013909627	CATHETER & NEEDLE UNIT IV 14GAx1.25IN 200S	394.0500
6515013909654	CATHETER & NEEDLE UNIT IV 18GAx1.25IN 200S	231.2500
6515013909650	CATHETER & NEEDLE UNIT IV 20GAx1.25IN 200S	111.0000
6505010235011	CLOTRIMAZOLE CREAM USP 1% 15GM	14.0000
6530014644424	COMPRESS COLD INSTANT NON-TOXIC 80S	23.0000
6515013738659	COVER ELECTRONIC THERMOMETER DISP 100S	405.4000
6515003245500	DEPRESSOR TONGUE WOOD 6x.75IN STR 100S	140.0000
6505001168350	DIPHENHYDRAMINE HCL CAPSULES 50MG 100S	24.0000
6510014575844	DRESSING BURN 8x18IN w/WATER-GEL 20S	120.0000
6510014001920	DRESSING CHEST WOUND SEAL ASHERMAN 10S	150.7500
6510002017425	DRESSING FIRST AID FIELD CAMO 11x12IN	316.0000

Figure 8. The Total Calculated by Supply Requirements – Units of Measure report.

The Time-Phased ReSupply Sorted by Functional Area Then Supply report (see Figure 9) tells medical planners whether a supply lasts the duration of the scenario.

Time Phased ReSupply sorted by FA then supply

SWA Moderate

Functional Area: 1RSP First Responder - Medical **MTFs:** 4

NSN: 6505009857301 **From FA:** First Responder - Medical **Qty/Pkg:** 1000.000

Nomen ACETAMINOPHEN TABLETS 0.325GM 1000S

	Period1	Period2	Period3	Period4	Period5	Period6
UM Qty	227.800	455.600	455.600	455.600	455.600	227.800
UI Qty	4000.000	4000.000	4000.000	4000.000	4000.000	4000.000
UI-	4000.000	0.000	0.000	0.000	0.000	0.000

Required Qty: 2278.0000 **Order qty:** 4000.000 **Num Pkgs:** 4

NSN: 6510002036010 **From FA:** First Responder - Medical **Qty/Pkg:** 1.000

Nomen ADHESIVE TAPE SURG 12INx5YDS MOLESKIN

	Period1	Period2	Period3	Period4	Period5	Period6
UM Qty	0.080	0.160	0.160	0.160	0.160	0.080
UI Qty	4.000	4.000	4.000	4.000	4.000	4.000
UI-	4.000	0.000	0.000	0.000	0.000	0.000

Required Qty: 0.8000 **Order qty:** 4.000 **Num Pkgs:** 4

Figure 9. Time-Phased ReSupply Sorted by Functional Area Then Supply report

The report categorizes each supply by UM, unit of issue (UI), and unit of issue reduced (UI-) for each FA.

UM is the amount of supply required to treat the patient stream. UI is the amount of the supply required to treat the patient stream rounded up to the nearest package size. UI- subtracts the amount of the supply already in the inventory, so that an additional order will not be placed. This report shows how different methods of packaging supplies affects the quantity required during each period throughout a scenario.

UI amounts carry over from period to period, such that if the supply is packaged in units of 12, and only 5 are needed for period one and 5 for period six, 2 units of 12 each will not be ordered (creating an inventory of 24), but rather the original package of 12 will cover both periods.

The Time-Phased ReSupply Sorted by Supply Then Functional Area report (see Figure 10) lists each supply and all the FAs in which it is used. The report displays the UM, UI, and UI- quantities for each period. This report is useful for viewing the demand for a particular supply for all FAs at once.

Time Phased ReSupply sorted by supply then FA

SWA Moderate

6505009857301 ACETAMINOPHEN TABLETS 0.325GM 1000S

	Period1	Period2	Period3	Period4	Period5	Period6
1RSP First Responder - Medical						**MTFs: 4**
UM Qty	227.800	455.600	455.600	455.600	455.600	227.800
UI Qty	4000.000	4000.000	4000.000	4000.000	4000.000	4000.000
UI-	4000.000	0.000	0.000	0.000	0.000	0.000
BAS Battalion Aid Station						**MTFs: 4**
UM Qty	544.000	1088.000	1088.000	1088.000	1088.000	544.000
UI Qty	4000.000	4000.000	4000.000	4000.000	4000.000	4000.000
UI-	4000.000	0.000	0.000	0.000	4000.000	0.000

Required Qty: 7718.0000 **Qty/Pkg:** 1000.000 **Order qty:** 12000.000 **Pkgs:** 12

6510002036010 ADHESIVE TAPE SURG 12INx5YDS MOLESKIN

	Period1	Period2	Period3	Period4	Period5	Period6
1RSP First Responder - Medical						**MTFs: 4**
UM Qty	0.080	0.160	0.160	0.160	0.160	0.080
UI Qty	4.000	4.000	4.000	4.000	4.000	4.000
UI-	4.000	0.000	0.000	0.000	0.000	0.000
BAS Battalion Aid Station						**MTFs: 4**
UM Qty	0.080	0.160	0.160	0.160	0.160	0.080
UI Qty	4.000	4.000	4.000	4.000	4.000	4.000
UI-	4.000	0.000	0.000	0.000	0.000	0.000

Required Qty: 1.6000 **Qty/Pkg:** 1.000 **Order qty:** 8.000 **Pkgs:** 8

Figure 10. Time-Phased ReSupply Sorted by Supply Then Functional Area

The Time-Phased ReSupply Sorted by Supply Totaled Across Functional Area – Unit of Issue report (see Figure 11) totals the quantity of each supply across all FAs. Each supply is listed in alphabetical order, and the quantities allotted for each period appear across the report in UI amounts, not UM, because using this method prevents accumulation of unnecessary inventory.

Time Phased ReSupply sorted by supply totalled across FA UI

SWA Moderate

Period1	Period2	Period3	Period4	Period5	Period6	Order Qty	Pkgs
6505009857301	**ACETAMINOPHEN TABLETS 0.325GM 1000S**						
8000.000	0.000	0.000	0.000	4000.000	0.000	12000.000	12
6510002036010	**ADHESIVE TAPE SURG 12INx5YDS MOLESKIN**						
8.000	0.000	0.000	0.000	0.000	0.000	8.000	8
6510000033058	**ADHESIVE TIES SURG MONTGOMERY 11x 7IN 24S**						
48.000	96.000	96.000	96.000	96.000	48.000	480.000	20
6515013215211	**AIRWAY KIT PERCUTANEOUS EMERGENCY ADULT 1S**						
6.000	4.000	2.000	4.000	6.000	0.000	22.000	22
6515011295437	**AIRWAY NASOPHARYNGEAL 28FR 10S**						
60.000	0.000	20.000	0.000	20.000	0.000	100.000	10
6515011676637	**AIRWAY NASOPHARYNGEAL ROBERTAZZI 30FR 12S**						
96.000	0.000	0.000	0.000	0.000	0.000	96.000	8
6515009582232	**AIRWAY PHARYNGEAL BERMAN DESIGN 80MM 12S**						
96.000	0.000	0.000	0.000	48.000	48.000	192.000	16
6515011649637	**AIRWAY PHARYNGEAL CUT AWAY FLANGE 30FR 30S**						
420.000	0.000	60.000	0.000	60.000	60.000	600.000	20
6505011169245	**ALBUTEROL INHALATION 17GM CONT 200 SPRAYS**						
6.000	2.000	2.000	2.000	4.000	0.000	16.000	16
6505011464268	**ALUMINUM CHLORIDE HEXAHYDRATE SOL 37 ML BT**						
4.000	0.000	0.000	4.000	0.000	0.000	8.000	8
6505014731770	**ALUMINUM MAGNESIUM TABS 100S**						
800.000	0.000	0.000	0.000	800.000	0.000	1600.000	16
6505013038962	**AMOXICILLIN & POTASSIUM CLAVULANATE 100S**						
400.000	0.000	400.000	400.000	0.000	400.000	1600.000	16

Figure 11. Time-Phased ReSupply Sorted by Supply Totaled Across Functional Area – Unit of Issue report.

This report is useful for ordering supplies because it gives a total number for each required supply, in both the UM and the package quantity.

Consumption Simulator

To run the Consumption Simulator, the second function of RSVP, users select a patient stream and an inventory of medical supplies, then time phase patient arrival and supply delivery over a series of time intervals. The Consumption Simulator evaluates how that inventory performs by simulating the consumption of its supplies as a particular patient stream arrives into the health care system. It has three screens: Scenario, Schedule Patients, and Evaluate.

The Scenario Screen

In the Scenario screen (see Figure 12), the user inputs the number of casualties, the number of days for the scenario, and the number of periods. Next, the user selects the scenario from which to generate the patient stream.

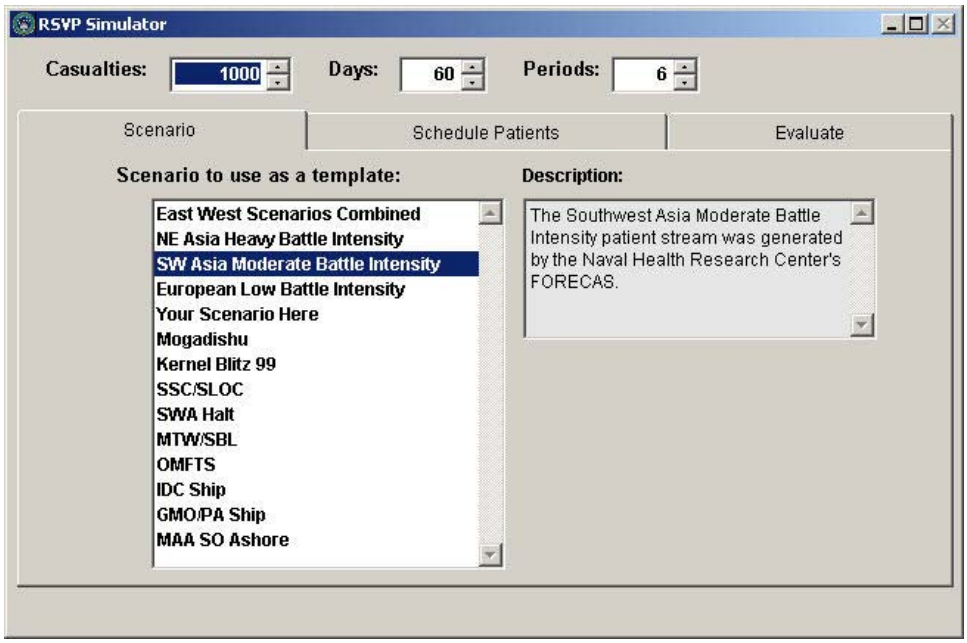

Figure 12. The Scenario screen for the Consumption Simulator.

The Schedule Patients Screen

The user then clicks the Schedule Patients tab and enters the number of casualties expected to arrive in each period over the length of the scenario. Once the quantities are entered, RSVP displays a bar graph showing the user's selection. At this point, the user can modify the patient schedule, which also changes the graph upon leaving the grid, ensuring the changes total 100%.

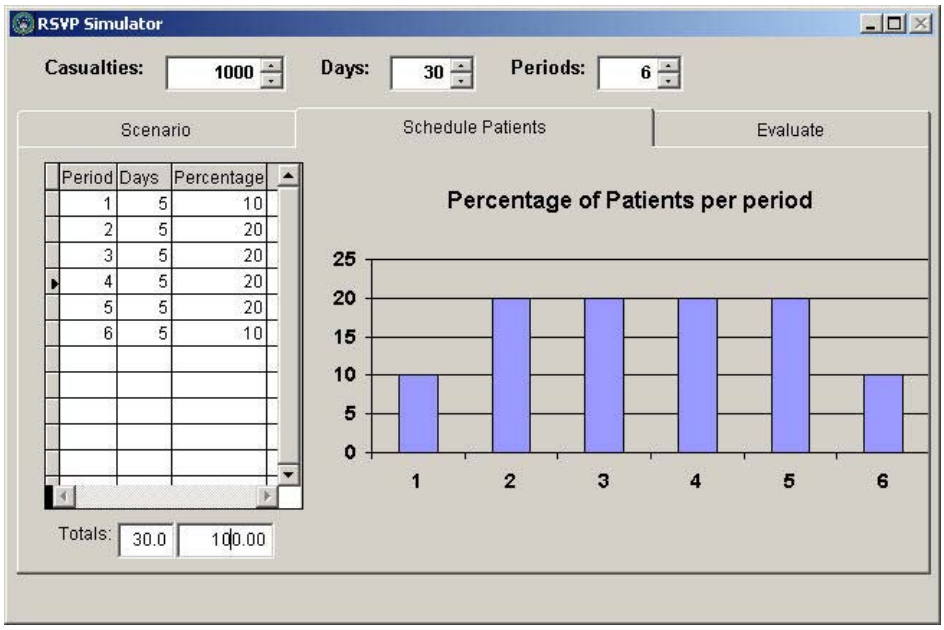

Figure 13. The Schedule Patients screen.

The Evaluate Screen

The user then clicks the Evaluate tab, selects the inventory to evaluate, and clicks the Evaluate button (see Figure 14).

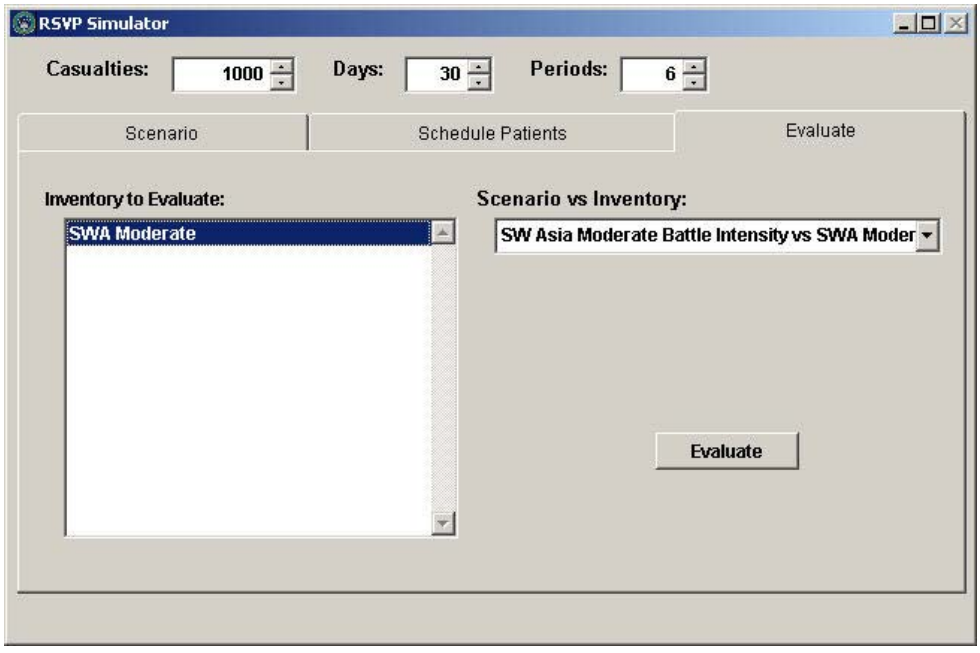

Figure 14. The Evaluate screen.

RSVP generates the patient stream based on the percentages of occurrence for each PC in the selected scenario and then calculates the supply demands for each period. RSVP uses the number of casualties expected in each time period to decrement the supply quantity in the inventory in order of patient arrival and treatment task completion.

For example, going back to the Schedule Patients screen (Figure 13), 10% of the patients, or 20 patients, are expected to occur in period 1. RSVP gets the supplies for period 1. As each patient comes through, the supply quantities required to treat those patients are decremented. When period 2 begins, RSVP gets the supplies for period 2. As the 21st patient comes through, RSVP decrements the supplies. This process is repeated for all periods.

Once the consumption simulation is complete, the user can view the reports by selecting Reports under the Analyze pull-down menu.

Simulation Reports

There are 13 different Simulation Reports. These, too, are separated by information concerning patient stream and supplies.
The scenario and patient description reports are:

- Simulation Descriptions
- Arrival Time Distributions by Hour and Day
- Patient Condition Distributions
- Patient Stream Log (also details supply usage)

The reports detailing lists of supplies for the patient stream are:

- Supply Depletions During Simulation
- Supply Depletions Summary
- Supply Usage Detailed by Patient Condition
- Supply Usage Summarized by Functional Area
- Supply List (UM) Sorted by Functional Area Then Supply
- Supply Quantity Delivery and Consumption – Depleted Supplies
- Supply List UM, UI, UI Reduced Sorted by Supply Then Functional Area
- Supply List UM, UI, UI Reduced and Supply Consumption
- Supply List UI Reduced by Period Sorted by Functional Area Then Supply

Descriptions of the simulation appear in the Simulation Descriptions report (see Figure 15), including the number of days in the scenario and how many patients are expected to be treated.

Simulation Descriptions

Simulation:	SW Asia Moderate Battle Intensity vs SWA
Days:	Moderate
Patients:	30
	1000
Scenario:	SW Asia Moderate Battle Intensity
	The Southwest Asia Moderate Battle Intensity patient stream was generated by the Naval Health Research Center's FORECAS.
Inventory:	SWA Moderate
	SWA Moderate

Figure 15. Simulation Descriptions report.

The patient stream is broken down into a schedule in the Arrival Time Distributions by Hour and Day report (see Figure 16). This report shows how the patient stream looks each day of the scenario.

Simulation: SW Asia Moderate Battle Intensity vs SWA Moderate
Inventory: SWA Moderate vs. Scenario: SW Asia Moderate Battle Intensity

Day	Hour	Patients
1	1	1
1	4	2
1	7	3
1	11	2
1	12	1
1	14	2
1	15	1
1	17	2
1	18	1
1	20	1
1	21	1
1	23	2
1	total	19
2	1	1
2	2	2
2	4	1
2	5	1
2	6	1
2	7	1
2	9	3
2	10	1

Day	Hour	Patients
4	19	1
4	21	1
4	22	1
4	23	1
4	24	1
4	total	20
5	1	1
5	3	1
5	6	2
5	8	3
5	10	1
5	11	2
5	12	2
5	13	1
5	14	5
5	17	1
5	19	1
5	20	5
5	22	1
5	23	1
5	total	27

Day	Hour	Patients
7	12	3
7	13	1
7	14	1
7	15	1
7	17	4
7	18	1
7	19	3
7	20	3
7	21	1
7	22	2
7	24	1
7	total	36
8	1	1
8	2	2
8	3	4
8	4	2
8	5	1
8	6	1
8	8	1
8	9	1
8	11	2

Figure 16. Arrival Time Distributions by Hour and Day report.

Planners can find out which PCs are included in the scenario on the Patient Condition Distributions report (see Figure 17), which shows patients' arrival day, length of stay, and how many cases per PC. The list is arranged by PC, and shows

when in the scenario that patient will arrive, how long their care is expected to take, and how many patients with that condition to expect. Personnel needs may be calculated with this report, since it gives insight into supplies and personnel needed from the perspective of what kind of injuries will need to be treated.

Simulation: SW Asia Moderate Battle Intensity vs SWA Moderate
Inventory: SWA Moderate vs. Scenario: SW Asia Moderate Battle Intensity

Patient Condition Distribution

	Patient Condition	Arrival day From	Arrival day to	Number of Patients
1	CEREBRAL CONCUSSION CLOSED WITH/WITHOUT NONDEPRESSED LINEAR SKULL FRACTURE SEVERE - LOSS OF CONSCIOUSNESS FROM 2 TO 12 HOURS	22	24	1
2	CEREBRAL CONCUSSION CLOSED WITH/WITHOUT NONDEPRESSED LINEAR SKULL FRACTURE MODERATE - LOSS OF CONSCIOUSNESS LESS THAN 2 HOURS	9	29	8
4	CEREBRAL CONTUSION CLOSED WITH/WITHOUT NONDEPRESSED LINEAR SKULL FRACTURE MODERATE - LOSS OF CONSCIOUSNESS FROM 12-24 HOURS WITHOUT FOCAL NEUROLOGICAL DEFICIT	10	10	1
13	WOUND SCALP OPEN WITHOUT CEREBRAL INJURY OR SKULL FRACTURE SEVERE - SCALPED WITH AVULSION OF TISSUE	6	24	7
14	WOUND SCALP OPEN WITHOUT CEREBRAL INJURY OR SKULL FRACTURE MODERATE - SCALP LACERATION	4	32	11
17	WOUND FACE JAWS AND NECK OPEN LACERATED WITH ASSOCIATED FRACTURES EXCLUDING SPINAL FRACTURES SEVERE - WITH AIRWAY OBSTRUCTION	12	25	2
18	WOUND FACE JAWS AND NECK OPEN LACERATED WITH ASSOCIATED FRACTURES EXCLUDING SPINAL FRACTURES MODERATE - WITHOUT AIRWAY OBSTRUCTION; EYELID AND EYEBALL LACERATION WITH RETAINED INTRAOCULAR FOREIGN BODY	6	26	4

Figure 17. Patient Condition Distributions report.

The Supply Depletions Summary report (see Figure 18) shows how many supplies will be depleted daily as an aggregate, not as individual pieces. This will tell the user at a glance when the largest supply depletions will occur, giving an indication of how to adjust the distribution of supplies.

Supply Depletions Summary

Inventory Depletion Days	Number of Supplies Depleted
zero	2
1 to 5	160
6 to 10	100
11 to 15	71
16 to 20	233
21 to 25	102
26 to 30	142

Figure 18. Supply Depletions Summary report.

The Supply Usage Detailed by Patient Condition report (see Figure 19) tracks supplies. Arranged alphabetically by supply, it then lists each FA and which PCs will be treated there. Also included is how many of an individual supply each PC requires, and the total used. This gives users the ability to go supply by supply and evaluate how many of each are needed and for which conditions.

Simulation: SW Asia Moderate Battle Intensity vs SWA Moderate
Inventory: SWA Moderate vs. Scenario: SW Asia Moderate Battle Intensity

Supply Usage Detailed by Patient Condition

6505009857301 ACETAMINOPHEN TABLETS 0.325GM 1000S

1RSP First Responder - Medical

Patient Condition		Uses	Total used
014	WOUND SCALP OPEN WITHOUT CEREBRAL INJURY OR SKULL FRACTURE MODERATE - SCALP LACERATION	11.00	66.0
213	CYST/ABSCESS ALLCASES INCLUDING MINOR INCISION	1.00	30.0
219	HYPERHIDROSIS ALL CASES	2.00	40.0
234	BRONCHITIS ACUTE ALL CASES	9.00	216.0
239	ACUTE RESPIRATORY DISEASE SEVERE	3.00	72.0
240	ACUTE RESPIRATORY DISEASE MODERATE	6.00	144.0
260	PHLEBITIS DEEP VEIN INVOLVEMENT	1.00	20.0
278	RENAL/URETERAL CALCULUS NOT CAUSING OBSTRUCTION	4.00	96.0
332	MALARIA MODERATE - ALL SPECIES	13.00	260.0
348	EYE WOUND DIRECTED ENERGY INDUCED (LASER) MODERATE NONMACULAR, NONOPTIC NERVE, NO VITREOUS BLOOD.	1.00	20.0
349	EYE WOUND DIRECTED ENERGY INDUCED (LASER/RFR) MILD TO MODERATE, ANTERIOR, PAIN WITH PHOTOPHOBIA AND DISRUPTION OF CORNEAL INTEGRITY.	2.00	40.0

BAS Battalion Aid Station

Patient Condition		Uses	Total used
014	WOUND SCALP OPEN WITHOUT CEREBRAL INJURY OR SKULL FRACTURE MODERATE - SCALP LACERATION	11.00	66.0
023	HEARING IMPAIRMENT SEVERE	1.00	6.0
024	HEARING IMPAIRMENT MODERATE	3.00	18.0

Figure 19. Supply Usage Detailed by Patient Condition report.

The Supply Depletions during Simulation report (see Figure 20) details, by supply, when in the mission each supply will run out. The report gives a day-by-day accounting, beginning with those supplies that will be depleted first. This report is useful for evaluating how well the inventory stocks the scenario, and for determining which supplies will need to be reordered first.

SW Asia Moderate Battle Intensity vs
Supply Depletions During Simulation

Nsn	Nomen	Quantity Estimated	Quantity Required	ECD	Depl Day
6530011075798	BAG STERILIZATION-BIOHAZ DISP 36x24IN 200S	2000.00	549.75	D	0
6530011832863	CONTAINER DISPOSE HYPO NDL & SYR 6.9QT 12S	0.00	102.57	D	0
6640011079169	DETERGENT GLASSWARE & INSTRUMENTS ALCONOX 4LB	256.00	279.71	C	0
6510014575844	DRESSING BURN 8x18IN w/WATER-GEL 20S	480.00	124.00	C	0
6510002020800	GAUZE PETROLATUM ACCORDION 18x3IN 12S	240.00	131.50	C	0
6515012738647	INTRODUCER SET CATHETER PERCUTANEOUS 4 COMP 2	94.00	147.75	C	0
6505010141378	NEOMYCIN POLYMY HYDROCORT OTIC SOL 10ML	0.00	20.00	M	0
6505004917557	POVIDONE-IODINE CLEANSING SOL 7.5% 118ML	6136.00	6119.75	M	0
6505012085955	RANITIDINE INJ 25MG/ML 2ML SINGLE DOSE 10S	0.00	14.00	M	0
6515003865800	TUBE STOMACH LAVAGE w/FUNNEL 30FR 60 IN LG 1S	0.00	0.00	C	0
6515012346838	APPLICATOR DISP SQUARED OFF TIP 100S	0.00	545.00	C	1
PN18029940503	BAG PLASTIC RESEALABLE ZIPLOCK 6x9IN 200S	800.00	512.00	C	1
6510009355822	BANDAGE ELASTIC ROLLED ACE 4INx4.5YDS 12S	0.00	370.69	C	1
6510000583047	BANDAGE GAUZE KERLIX 4.5IN x 4YDS 100S	7800.00	5576.50	C	1
6135009857845	BATTERY NONRECHARGABLE 1.5V AA 24S	4560.00	1909.00	D	1
7530002223525	BOOK,MEMORANDUM,10.5x8",RULED,192PAGES	0.00	698.25	C	1
6515013909627	CATHETER & NEEDLE UNIT IV 14GAx1.25IN 200S	3200.00	1283.30	C	1
6515013909650	CATHETER & NEEDLE UNIT IV 20GAx1.25IN 200S	1600.00	187.45	C	1
6505014802501	CEFAZOLIN INJECTION 1GM VIAL 25S	1000.00	1398.20	M	1
6505012426532	CEFOTETAN DISODIUM STERILE 2GM VIAL 10S	440.00	373.20	M	1
6505012192760	CEFTRIAXONE SODIUM 1GM VIAL 10S	260.00	572.80	M	1
6530014604782	CONTAINER SHARPS FOLD-FLAT 5 LITER 25S	300.00	111.75	D	1
6515013738659	COVER ELECTRONIC THERMOMETER DISP 100S	2400.00	2033.00	C	1
6530000000070	CUP MEDICINE PLAS 1 OZ POLYPROPOLENE 5000S	0.00	729.00	C	1
6840014763011	DISINFECTANT INSTRUMENT SURG CIDEX OPA 1GL 4S	8192.00	4810.00	C	1
6550010754011	FECAL SPECIMAN COLLECT/PREPARAT KIT 20S	0.00	299.00	C	1

Figure 20. Supply Depletions During Simulation report.

Users may want to know how each supply is distributed across FAs. The Supply Usage Summarized by Functional Area report (see Figure 21) arranges that information first by FA, then alphabetically by supply, and again lists totals used. This enables users to quickly go down their inventory list by supply.

Simulation: SW Asia Moderate Battle Intensity vs SWA Moderate
Inventory: SWA Moderate vs. Scenario: SW Asia Moderate Battle Intensity

Supply Usage Summarized by Functional Area

	Functional Area	Uses	Total used
6505009857301	ACETAMINOPHEN TABLETS 0.325GM 1000S		
	1RSP First Responder - Medical	53.00	1004.0
	BAS Battalion Aid Station	146.00	2966.0
	SC Triage/SST	14.00	38.0
	SC Ward	48.00	948.0
	Total for ACETAMINOPHEN TABLETS 0.325GM 1000S		**4956.0**
6515010701497	ADAPTER INJECTION SITE SODIUM LOCK		
	SC Triage/SST	141.00	90.0
	SC Ward	69.00	8.0
	Total for ADAPTER INJECTION SITE SODIUM LOCK		**98.0**
6515008801832	ADAPTER RIGHT ANGLE ELBOW TRACHEAL ANESTHESIA		
	SC Operating Room	198.00	102.0
6515008801833	ADAPTER Y-PIECE TRACHEAL ANESTHESIA SET CATHE		
	SC Operating Room	198.00	102.0
6505013809548	ADENOSINE INJ 3MG/ML 2ML SINGLE DOSE VIAL 10S		
	SC Triage/SST	84.00	90.0
6510002036010	ADHESIVE TAPE SURG 12INx5YDS MOLESKIN		
	1RSP First Responder - Medical	3.00	0.6
	BAS Battalion Aid Station	3.00	0.6
	SC Triage/SST	2.00	0.4
	Total for ADHESIVE TAPE SURG 12INx5YDS MOLESKIN		**1.6**

Figure 21. Supply Usage Summarized by Functional Area report.

Unit of measure (UM) is the amount of each supply required to treat the patient stream. The Supply List (UM) Sorted by Functional Area Then Supply report (see Figure 22) sorts supplies first by FA, then by supply. The list gives the per package amount and the quantity required by the scenario, which allows users to see how each FA will be stocked.

Simulation: SW Asia Moderate Battle Intensity vs SWA Moderate
Inventory: SWA Moderate vs. Scenario: SW Asia Moderate Battle Intensity

Supply List (UM) sorted by FA then Supply

SWA Moderate

1RSP First Responder - Medical

Nsn	Nomen	per Pkg	Quantity
6505009857301	ACETAMINOPHEN TABLETS 0.325GM 1000S	1000.00	2278.00
6510002036010	ADHESIVE TAPE SURG 12INx5YDS MOLESKIN	1.00	0.80
6515011676637	AIRWAY NASOPHARYNGEAL ROBERTAZZI 30FR 12S	12.00	10.80
6515009582232	AIRWAY PHARYNGEAL BERMAN DESIGN 80MM 12S	12.00	54.00
6515011649637	AIRWAY PHARYNGEAL CUT AWAY FLANGE 30FR 30S	30.00	43.20
6505014731770	ALUMINUM MAGNESIUM TABS 100S	100.00	467.00
6510012787002	APPLICATOR IMPREG w/BENZOIN 4IN LG 50OS	500.00	16.00
6515009051473	APPLICATOR PLASTIC/WOOD ROD 6IN LG 2000S	2000.00	192.50
6505001009985	ASPIRIN TABS .32GM 100S (ACLS protocol only)	100.00	7.00
6510009137909	BANDAGE ADHESIVE FLESH 3x.75IN 30OS	300.00	17.00
6510001055807	BANDAGE ELASTIC COBAN FLESH 3" X 5YD 24S	24.00	438.50
6510009355823	BANDAGE ELASTIC ROLLED ACE 6INx4.5YDS 12S	12.00	192.75
6510000583047	BANDAGE GAUZE KERLIX 4.5IN x 4YDS 10OS	100.00	2517.15
6510002011755	BANDAGE MUSLIN CAMOUFLAGE 37x37x52IN 1S	1.00	440.25
6505014213787	BENZOCAINE MENTH CETYLPYRD LOZENGES 648S	648.00	144.00
6505014437607	BISMUTH SUBSALICYLATE TABLETS CHEWABLE 30S	30.00	920.00
6515013909627	CATHETER & NEEDLE UNIT IV 14GAx1.25IN 200S	200.00	394.05
6515013909654	CATHETER & NEEDLE UNIT IV 18GAx1.25IN 200S	200.00	231.25
6515013909650	CATHETER & NEEDLE UNIT IV 20GAx1.25IN 200S	200.00	111.00
6505010235011	CLOTRIMAZOLE CREAM USP 1% 15GM	1.00	14.00
6530014644424	COMPRESS COLD INSTANT NON-TOXIC 80S	80.00	23.00

Figure 22. Supply List (UM) Sorted by Functional Area Then Supply report.

The Supply Quantity Delivery and Consumption – Depleted Supplies report (see Figure 23) shows how each supply will be decremented over the course of the scenario. It is broken down by FA, then alphabetically by supply. Each supply quantity is then shown over 6 periods. In this example, the supply quantity is delivered at the beginning of the scenario. This will show if enough of the supply has been ordered for the scenario.

Simulation: SW Asia Moderate Battle Intensity vs SWA Moderate
Inventory: SWA Moderate vs. Scenario: SW Asia Moderate Battle Intensity

Supply Quantity Delivery and Consumption - depleted supplies

BAS Battalion Aid Station

6515014211388 TUBE TRACHEAL ESOPHAGEAL COMBITUBE 41 FR 4S Units EA

Pkg Qty 4.000 Consumable **Day Depleted** 1.00

	Period1	Period2	Period3	Period4	Period5	Period6	Total
Qty In	16.000	32.000	16.000	32.000	16.000	16.000	128.000
Qty Out	3.000	6.000	11.000	6.000	7.000	3.000	36.000

FRSS Pre-op

XXXXXXXXXX2O FORM PRINTED RESUSCITATION TRAUMA 4-PAGES Units EA

Pkg Qty 1.000 Consumable **Day Depleted** 2.00

	Period1	Period2	Period3	Period4	Period5	Period6	Total
Qty In	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Qty Out	9.000	25.000	22.000	22.000	20.000	14.000	112.000

FRSS Post-op

XXXXXXXXXX2O FORM PRINTED RESUSCITATION TRAUMA 4-PAGES Units EA

Pkg Qty 1.000 Consumable **Day Depleted** 10.00

	Period1	Period2	Period3	Period4	Period5	Period6	Total
Qty In	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Qty Out	0.000	16.000	68.000	108.000	72.000	96.000	360.000

6545015099851 PACK POST-OP SURGICAL 3S Units EA

Pkg Qty 3.000 Consumable **Day Depleted** 11.00

	Period1	Period2	Period3	Period4	Period5	Period6	Total
Qty In	150.000	294.000	294.000	294.000	294.000	144.000	1470.000
Qty Out	0.000	24.000	102.000	156.000	114.000	144.000	540.000

Figure 23. Supply Quantity Delivery and Consumption – Depleted Supplies report.

To see how the patient stream uses supplies, the Patient Stream Log (see Figure 24) shows each FA and lists the supplies used in that area over the 6 periods. Supplies are grouped by medications, consumables, or durables, and the chart shows how many are available at the beginning and end of each period. It also indicates the day the supply will run out.

Patient Stream Log

Patients 53 Number Treated 53

First Responder - Medical

Supply		Qty
6505009857301	ACETAMINOPHEN TABLETS 0.325GM 1000S	1004.0000

Patients 146 Number Treated 146

Battalion Aid Station

Supply		Qty
6505009857301	ACETAMINOPHEN TABLETS 0.325GM 1000S	2966.0000

Patients 15 Number Treated 14

Triage/SST

Supply		Qty
6505009857301	ACETAMINOPHEN TABLETS 0.325GM 1000S	42.0000

Patients 49 Number Treated 48

Ward

Supply		Qty
6505009857301	ACETAMINOPHEN TABLETS 0.325GM 1000S	984.0000

Patients 142 Number Treated 141

Triage/SST

Supply		Qty
6515010701497	ADAPTER INJECTION SITE SODIUM LOCK	91.0000

Figure 24. Patient Stream Log report.

To sort first by supply then by FA, the user can select the Supply List UM, UI, UI Reduced Sorted by Supply then Functional Area report (see Figure 25). This report views supplies across FAs, and shows quantities as they decrement according to patient usage. The UM, UI and UI reduced (UI-) amounts are broken out and listed by period. The user can then see where each supply is needed and how many will be needed to meet demand in all FAs.

Simulation: SW Asia Moderate Battle Intensity vs SWA Moderate
Inventory: SWA Moderate vs. Scenario: SW Asia Moderate Battle Intensity

Supply List UM,UI,UI reduced sorted by Supply then FA

6505009857301 ACETAMINOPHEN TABLETS 0.325GM 1000S TB 1000.000

1RSP First Responder - Medical

	Qty1	Qty2	Qty3	Qty4	Qty5	Qty6	Total
UM Qty	227.8000	455.6000	455.6000	455.6000	455.6000	227.8000	2278.00
UI Qty	4000.0000	4000.0000	4000.0000	4000.0000	4000.0000	4000.0000	24000.00
UI reduced	4000.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4000.00

BAS Battalion Aid Station

	Qty1	Qty2	Qty3	Qty4	Qty5	Qty6	Total
UM Qty	544.0000	1088.0000	1088.0000	1088.0000	1088.0000	544.0000	5440.00
UI Qty	4000.0000	4000.0000	4000.0000	4000.0000	4000.0000	4000.0000	24000.00
UI reduced	4000.0000	0.0000	0.0000	0.0000	4000.0000	0.0000	8000.00

6510002036010 ADHESIVE TAPE SURG 12INx5YDS MOLESKIN RL 1.000

1RSP First Responder - Medical

	Qty1	Qty2	Qty3	Qty4	Qty5	Qty6	Total
UM Qty	0.0800	0.1600	0.1600	0.1600	0.1600	0.0800	0.80
UI Qty	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	24.00
UI reduced	4.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.00

BAS Battalion Aid Station

	Qty1	Qty2	Qty3	Qty4	Qty5	Qty6	Total
UM Qty	0.0800	0.1600	0.1600	0.1600	0.1600	0.0800	0.80
UI Qty	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	24.00
UI reduced	4.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.00

Figure 25. Supply List UM, UI, UI Reduced Sorted by Supply then Functional Area report

The rate of consumption is easily viewed in the Supply List UM, UI, UI Reduced and Supply Consumption report (see Figure 26). It lists supplies in alphabetical order and charts decremented quantities throughout the scenario.

Simulation: SW Asia Moderate Battle Intensity vs SWA Moderate
Inventory: SWA Moderate vs. Scenario: SW Asia Moderate Battle Intensity

Supply List UM,UI,UI reduced and Supply Consumption

1RSP First Responder - Medical

							UM	**Pkg Size**
6505009857301 ACETAMINOPHEN TABLETS 0.325GM 1000S							TB	1000.000
Period	1	2	3	4	5	6	Total	**Qty Left**
UM Qty	227.80	455.60	455.60	455.60	455.60	227.80	2278.00	1274.00
UI Qty	4000.00	4000.00	4000.00	4000.00	4000.00	4000.00	24000.00	22996.00
In UI-	4000.00	0.00	0.00	0.00	0.00	0.00	4000.00	2996.00
Out	0.00	72.00	356.00	536.00	40.00	0.00	1004.00	

							UM	**Pkg Size**
6510002036010 ADHESIVE TAPE SURG 12INx5YDS MOLESKIN							RL	1.000
Period	1	2	3	4	5	6	Total	**Qty Left**
UM Qty	0.08	0.16	0.16	0.16	0.16	0.08	0.80	0.20
UI Qty	4.00	4.00	4.00	4.00	4.00	4.00	24.00	23.40
In UI-	4.00	0.00	0.00	0.00	0.00	0.00	4.00	3.40
Out	0.00	0.00	0.00	0.00	0.60	0.00	0.60	

Figure 26. Supply List UM, UI, UI Reduced and Supply Consumption report.

Sorting by FA then supply, the Supply List UI Reduced by Period Sorted by Functional Area Then Supply report (see Figure 27) quickly shows the inventory of supplies at each FA, and how many will be available by period. If they are all scheduled to arrive at the beginning of the scenario, the list will look more like Figure 26, in which the majority of supplies are grouped in period 1.

Simulation: SW Asia Moderate Battle Intensity vs SWA Moderate
Inventory: SWA Moderate vs. Scenario: SW Asia Moderate Battle Intensity

Supply List UI reduced by Period sorted by FA then Supply

1RSP First Responder - Medical

Supply		Period 1	2	3	4	5	6
6505009857301	Acetaminophen Tablets 0.325gm 1000s	4000.00	0.00	0.00	0.00	0.00	0.00
6510002036010	Adhesive Tape Surg 12inx5yds Moleskin	4.00	0.00	0.00	0.00	0.00	0.00
6515011676637	Airway Nasopharyngeal Robertazzi 30fr 12s	48.00	0.00	0.00	0.00	0.00	0.00
6515009582232	Airway Pharyngeal Berman Design 80mm 12s	48.00	0.00	0.00	0.00	48.00	0.00
6515011649637	Airway Pharyngeal Cut Away Flange 30fr 30s	120.00	0.00	0.00	0.00	0.00	0.00
6505001161120	Sodium Chloride Injection 500ml 12s	48.00	0.00	48.00	48.00	0.00	48.00
6505011533024	Ringer's Injection Lactated Usp 500 Ml 12s	48.00	0.00	48.00	48.00	0.00	48.00
6510012787002	Applicator Impreg W/benzoin 4in Lg 500s	2000.00	0.00	0.00	0.00	0.00	0.00
6515009051473	Applicator Plastic/wood Rod 6in Lg 2000s	8000.00	0.00	0.00	0.00	0.00	0.00
6505001009985	Aspirin Tabs .32gm 100s (acls Protocol Only)	400.00	0.00	0.00	0.00	0.00	0.00
6510002011755	Bandage Muslin Camouflage 37x37x52in 1s	48.00	88.00	88.00	88.00	88.00	44.00
6510009137909	Bandage Adhesive Flesh 3x.75in 300s	1200.00	0.00	0.00	0.00	0.00	0.00
6510001055807	Bandage Elastic Coban Flesh 3" X 5yd 24s	96.00	96.00	96.00	96.00	96.00	0.00
6510009355823	Bandage Elastic Rolled Ace 6inx4.5yds 12s	48.00	48.00	48.00	0.00	48.00	48.00
6510000583047	Bandage Gauze Kerlix 4.5in X 4yds 100s	400.00	400.00	800.00	400.00	400.00	400.00
6505014213787	Benzocaine Menth Cetylpyrd Lozenges 648s	2592.00	0.00	0.00	0.00	0.00	0.00
6515013909627	Catheter & Needle Unit Iv 14gaxl.25in 200s	800.00	0.00	0.00	0.00	0.00	0.00
6515013909654	Catheter & Needle Unit Iv 18gaxl.25in 200s	800.00	0.00	0.00	0.00	0.00	0.00
6515013909650	Catheter & Needle Unit Iv 20gaxl.25in 200s	800.00	0.00	0.00	0.00	0.00	0.00
6505010235011	Clotrimazole Cream Usp 1% 15gm	4.00	4.00	0.00	4.00	4.00	0.00
6515013738659	Cover Electronic Thermometer Disp 100s	400.00	0.00	0.00	0.00	0.00	400.00

Figure 27. Supply List UI Reduced by Period Sorted by Functional Area Then Supply report.

Discussion

You can use RSVP for planning, scheduling, and ordering the optimal configuration and delivery of supplies for any type of operation. Based on estimated patient streams, RSVP identifies those supply items that are considered high use, which can assist in developing likely resupply configurations. RSVP can benefit the Navy and Marine Corps by:

- Decreasing the medical logistics footprint ashore.
- Reducing costs of acquiring, storing, and maintaining medical assets.
- Decreasing on-hand quantities of supplies and inventory holding costs.
- Reducing personnel needs associated with storing, maintaining, and inventorying medical supplies.
- Pushing forward the high frequency usage supply items.

Conclusion

RSVP is a planning tool that can help prepare for operational missions, providing insight into whether an inventory is sufficient for a patient stream. The user can define scenario parameters, including casualty numbers, days in theater, medical treatment facilities, and supply delivery schedules to approximate an operation. Using those user-defined parameters to model a patient stream that might flow through the health care system, RSVP generates an inventory and simulates its consumption.

To simulate inventory consumption, RSVP time phases the arrival of a particular patient stream and supply delivery as they might actually occur. This enables RSVP to show whether or not a supply delivery schedule can successfully accommodate the arrival of a particular patient stream. It tracks shortages and excesses in the supply inventory, identifying when in the scenario an individual supply becomes exhausted, as well as the patient who consumed it.

RSVP provides a more precise method for reordering supplies, because it details the quantity (in unit of issue and unit of measure) of each supply delivered, used, and overstocked for each time interval in the delivery schedule.

RSVP generates a variety of reports to address as wide a variety of users' concerns as possible.

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To help the United States Marine Corps streamline its medical materiel, the Naval Health Research Center expanded the Estimating Supplies Program (ESP) into the ReSupply Validation Program (RSVP) to link medical materiel to a defined patient stream. RSVP is a simulation program that validates medical supply configurations by stochastically generating multiple iterations of a patient stream, generating the supplies necessary to treat the patients, and comparing these needs with a time-phased inventory. This document explains what RSVP does, how it works, and why it is useful for the medical planning and logistics communities.

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