

BAR CODE MEDICATION ADMINISTRATION (BCMA)

**TECHNICAL MANUAL/SECURITY GUIDE**

# Version 3.0

February 2004

(Revised January 2011)

Department of Veterans Affairs Product Development

Each time this manual is updated, the Title Page lists the new revised date and this page describes the changes. If the Revised Pages column lists “All,” replace the existing manual with the reissued manual. If the Revised Pages column lists individual entries (e.g., 25, 32), either update the existing manual with the Change Pages Document or print the entire new manual.

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| **Date** | **Revised Pages** | **Patch Number** | **Description** |
| 01/2011 | i-ii, 6, 7, 10,  15,  B-2, B-4 | PSB\*3\*42 | Added note and list of BCMA Reports that were added to GUI only. Added definition of data field change for Indian Health Service.  Added Indian Health Service terms to Glossary.  REDACTED |
| 10/2009 | i-ii, 7, 9, 17 | PSB\*3\*47 | Added PSBPXFL and PSBPXLP to the list of installed routines. Add Immunizations Documentation by BCMA Nightly Task [PSB PX BCMA2PCE TASK] option to the *Manager* [PSB MGR] menu. Added Patient Care Encounter to the External Relationships section.  REDACTED |
| 01/2009 | i-ii, iv, 6-7,  13-14,  18-19, 21 | PSB\*3\*28 | * Update Table of Contents to include Remote Procedure Calls. (p. iv) * Increased the total for the BCMA V .3.0 routines to 85 and files to 6. (p.6-7) * Updated the files and “BCMA V.3.0 Routines Installed onto VistA Server” Example. (p.7) * Updated the Mail Group Types in BCMA V.3.0 to include scanning failures. (p. 13) * Updated Security Keys to include PSB UNABLE TO SCAN. (p. 14) * Added list of Remote Procedure Calls (RPCs). (p. 18)   -Added new Glossary entry for LIMITED ACCESS BCMA. (p. 19)   * Added new Glossary entry for PSB UNABLE TO SCAN. (p. 21) REDACTED |
| 03/2008 | 6-7, 9-10,  C-1, C-2,  C-4, C-5,  C-7, C-9 | PSB\*3\*2 | Description of [PSBO BZ] functionality added, code strings updated (p. C-1.)   * Updated Intermec Printer Team Type Codes Information, Intermec Barcode Label Field Position Map, Intermec printer Sample Terminal Type File code descriptions updated (pp. C-4, C-5, C-7.) * Barcode samples updated – references to “Dosage” changed to “Dose” and space between colon and dose measurement deleted (p. C-9.)   REDACTED |
| 09/2007 | 6-7 | PSB\*3\*32 | * Increased the total for the BCMA V. 3.0. routines to 68. (p.6) * Updated the “BCMA V. 3.0 Routines Installed onto VistA Server” example to include the following routine: PSBO XA. (p. 7)   REDACTED |

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| **Date** | **Revised Pages** | **Patch Number** | **Description** |
| 08/2006 | 6-7, | PSB\*3\*13 | – Increased the total for the BCMA V. 3.0. routines to 68. (p.6) |
|  | 9, 13 |  | – Updated the “BCMA V. 3.0 Routines Installed onto VistA Server” example to include the following routine: PSBO XA. (p. 7) |
|  |  |  | – Updated Manager Menu [PSB MGR] options list to include Missing Dose Follow-up (correction) and Unknown Action Status Report (new with this patch). (p. 9) |
|  |  |  | – Added description of the “Unknown Actions” mail group parameter. (p. 13) |
|  |  |  | REDACTED |
| 08/2006 | iv,  6, C1-C10 | PSB\*3\*2 | **Note**: The functionality listed below will be activated with the release of PSB\*3\*2.   * Updated Table of Contents to include new Appendix C. (p. iv) * Added reference to new Unit Dose label printing functionality and Appendix C. (p. 6) * Added Appendix C: Interfacing with the Bar Code Label Printer. (p. C1-C10)   REDACTED |
| 12/2005 | 6-7 | PSB\*3\*16 | * Increased the total for the BCMA V. 3.0. routines to 67. (p.6) * Updated the “BCMA V. 3.0 Routines Installed onto VistA Server” example to include the following routines: PSBCSUTL, PSBCSUTX, PSBCSUTY. (p. 7)   REDACTED |
| 01/2005 | 6-7,  14,  20-21 | PSB\*3\*4 | * Increased the total for the BCMA V. 3.0. routines to 64. (p.6) * Updated the “BCMA V. 3.0 Routines Installed on to VistA Server” example to include the PSBOPF routine. (p. 7). * Added description for new PSB READ ONLY security key. (p.14) * Added new Glossary entries for PSB READ ONLY and Read-Only BCMA. (p. 20-21)   REDACTED |
| 10/2004 | 6-7 | PSB\*3\*3 | * Increased the total for the BCMA V. 3.0 routines to 63. (p. 6) * Updated the “BCMA V. 3.0 Routines Installed on to VistA Server” example to reflect the inclusion of routines PSBML2, PSBML3, and PSBMLLKU to the VistA Server. (p. 7)   REDACTED |
| 02/2004 |  |  | Original Released BCMA V. 3.0 Technical Manual/Security Guide  REDACTED |

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| **Minimum Required Packages** | Before installing BCMA V. 3.0, make sure that your system includes the following Department of Veterans Affairs (VA) software packages and versions (those listed or higher). |

## Example: Minimum Required Packages and Versions



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| **Package** | **Minimum Version Needed** |
| Inpatient Medications | 5.0 |
| Kernel | 8.0 |
| MailMan | 8.0 |
| Nursing | 4.0 |
| Order Entry/Results Reporting | 3.0 |
| Pharmacy Data Management | 1.0 |
| RPC Broker (32-bit) | 1.1 |
| Toolkit | 7.3 |
| VA FileMan | 22.0 |
| Vitals/Measurements | 5.0 |

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| **Installation Time Estimates**  **IMPORTANT:**  You should install and test BCMA in your test accounts ***before*** installing in  your production | On average, it takes approximately two minutes to install BCMA  V. 3.0. This estimate was provided by a few of our BCMA V. 3.0 Beta Test sites. Actual times may vary, depending on how your site is using its’ system resources.  Suggested time to install: non-peak requirement hours. During the install process, PC Client users should not be accessing the Client Software. |

accounts.



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| **Resource Requirements**  **TIP:**  The approximate size for ^PSB was calculated using a “normal” medication pass for a Unit Dose and an IV medication order.  This is only an estimated number; it serves as the “mean.” | This section summarizes the (approximate) number of resources required to install BCMA V. 3.0.   * Routines 84 * Globals 1 (^PSB) * Files 6 (53.66-53.79) * ^PSB Size Unit Dose = 300 x # of Medications (in bytes) Administered   IV = 2100 x # of IV Bags Administered   * FTEE Support .2 * FTEE Maintenance .2   **Response Time Monitor**  BCMA V. 3.0 does not include Response Time Monitor hooks.  **Laptops and Bar Code Scanners**  The approximate requirements for laptops and bar code scanners depend on the number of Inpatient areas, at your site, that use BCMA  V. 3.0 for administering active medication orders. The BCMA Development Team recommends that your site have a minimum of three laptops and three scanners for each ward.  **Printers**  Your site should provide printers for creating patient wristbands and medication bar code labels, and for handling Missing Dose Requests sent from BCMA V. 3.0 to the Pharmacy.  **Unit Dose Label Printer Devices**  BCMA V. 3.0 includes the *Label Print* [PSBO BL] option for printing individual or batch Unit Dose bar code labels. This option allows sites the flexibility to use any printer that has bar code printing capabilities to produce BCMA bar code labels. Routine PSBOBL uses site-specific printers or terminals to produce labels. See Appendix C: “Interfacing with the Bar Code Label Printer” for detailed setup information.  **IV Label Printer Devices**  Inpatient Medications V. 5.0 provides a menu option for printing individual or batch IV bar code labels. See the section “Interfacing with  the Bar Code Label Printer” in the *Inpatient Medications V. 5.0 Technical Manual/Security Guide* for detailed setup information. |



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| **Files Required to Run BCMA V. 3.0**  **TIP:**  The namespace for the BCMA package is PSB and the primary global  is ^PSB. | BCMA V. 3.0 uses the following files installed on the VistA Server. “Journaling” is recommended.   * ^PSB (53.66, BCMA IV Parameters * ^PSB (53.68, BCMA Missing Dose Request * ^PSB (53.69, BCMA Report Request * ^PSB (53.77, BCMA Unable to Scan Log * ^PSB (53.78, BCMA Medication Variance Log * ^PSB (53.79, BCMA Medication Log   **Note:** You can learn more about these files by generating a list with file attributes using VA FileMan. |
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| **Routines Installed** | Review the listing below to learn the routines installed on to your site’s VistA Server during the installation of BCMA V. 3.0. The first line of each routine briefly describes its general function.  **Note:** You can use the *Kernel First Line Routine Print* [XU FIRST LINE PRINT] option to print a list containing the first line of each PSB routine.  **Routine Mapping**  At this time, we do *not* offer any recommendations for routine mapping. However, if you choose to map the BCMA V. 3.0 package routines, you will need to bring your system down, and then restart it  to load the new routines into memory. |

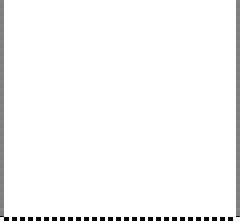
## Example: BCMA V. 3.0 Routines Installed onto VistA Server

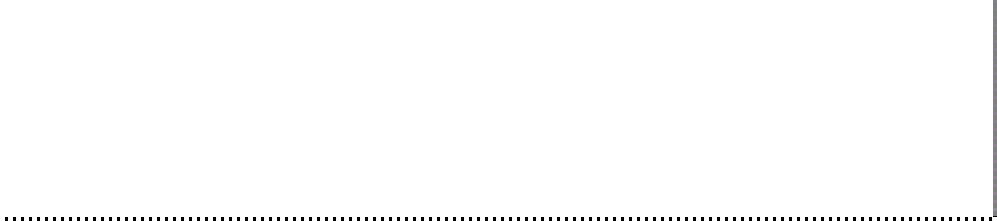
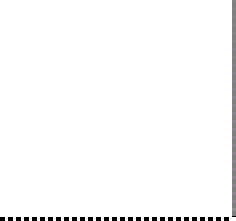
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| PSBALL | PSBAPIPM | PSBCHIVH | PSBCHKIV | PSBCSUTL | PSBCSUTX | PSBCSUTY |
| PSBMD | PSBML | PSBML1 | PSBML2 | PSBML3 | PSBMLEN | PSBMLEN1 |
| PSBMLHS | PSBMLLKU | PSBMLTS | PSBMLU | PSBMLVAL | PSBO | PSBO1 |
| PSBOAL | PSBOBL | PSBOBLU | PSBOBZ | PSBOCE | PSBOCE1 | PSBOCI |
| PSBOCI1 | PSBOCM | PSBOCM1 | PSBOCP | PSBOCP1 | PSBODL | PSBODL1 |
| PSBODO | PSBOHDR | PSBOIV | PSBOIV1 | PSBOMD | PSBOMH | PSBOMH1 |
| PSBOMH2 | PSBOML | PSBOMM | PSBOMM2 | PSBOMT1 | PSBOMV | PSBOPE |
| PSBOPF | PSBOPI | PSBOPM | PSBOPM1 | PSBOSF | PSBOST | PSBOVT |
| PSBOWA | PSBOXA | PSBPAR | PSBPARIV | PSBPOIV | PSBPRN | PSBPXFL |
| PSBPXLP | PSBRPC | PSBRPC1 | PSBRPC2 | PSBRPC3 | PSBRPCMO | PSBRPCXM |
| PSBSAGG | PSBSVHL7 | PSBUTL | PSBVAR | PSBVDLIV | PSBVDLPA | PSBVDLPB |
| PSBVDLTB | PSBVDLU1 | PSBVDLU3 | PSBVDLUD | PSBVDLVL | PSBVITFL | PSBVT1 |
| 84 | routines |  |  |  |  |  |

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| **BCMA CHUI Menus** | BCMA V. 3.0 exports three main menus. They include those listed below, in the CHUI version of BCMA V. 3.0. The options for each menu are listed in this section.   * **Manager Menu:** [PSB MGR] is assigned to managers * **Pharmacist Menu:** [PSB PHARMACY] is assigned to all inpatient Pharmacists * **Nurse Menu:** [PSB NURSE] is assigned to all clinicians and other personnel who administer active medication orders   **Manager Menu [PSB MGR]**  This menu includes the following options:   * Drug File Inquiry * Immunizations Documentation by BCMA Nightly Task * Medication Administration Menu Nursing   + Medication Administration Log Report   + Missed Medications Report   + Ward Administration Times Report   + Due List Report   + PRN Effectiveness List Report   + Enter PRN Effectiveness   + Manual Medication Entry   + Medication Administration History (MAH) Report   + Missing Dose Request   + Medication Variance Log   + Drug File Inquiry * Medication Administration Menu Pharmacy   + Medication Administration Log Report   + Missed Medications Report   + Due List Report   + Medication Administration History (MAH) Report   + Missing Dose Request   + Missing Dose Follow-up   + Missing Dose Report   + Label Print   + Drug File Inquiry * Missing Dose Follow-up * Reset User Parameters * Trouble Shoot Med Log * Unknown Action Status Report |

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| **BCMA CHUI Menus (cont.)** | **Pharmacy Medication Administration Menu [PSB PHARMACY]**  This menu includes the following options:   * Medication Administration Log Report * Missed Medications Report * Due List Report * Medication Administration History (MAH) Report * Missing Dose Request * Missing Dose Follow-up * Missing Dose Report * Label Print * Drug File Inquiry   **Nursing Medication Administration Menu [PSB NURSE]**  This menu includes the following options:   * Medication Administration Log Report * Missed Medications Report * Ward Administration Times Report * Due List Report * PRN Effectiveness List Report * Enter PRN Effectiveness * Manual Medication Entry * Medication Administration History (MAH) Report * Missing Dose Request * Medication Variance Log * Drug File Inquiry   **Note:** The following reports have been added to BCMA and are available via GUI only, but have not been added to the CHUI menus.   * Cover Sheet Reports:   + Medication Overview   + PRN Overview   + IV Overview   + Expired/DC’d/Expiring Orders * IV Bag Status Report * Medication Therapy Report * Unable to Scan Detailed Report * Unable to Scan Summary Report |

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| **Developing a Contingency Plan** | In March 2006, patch PSB\*3\*8, the BCMA Backup System (BCBU), was reissued with significant enhancements to the field as a Class I solution for the BCMA Contingency Plan. This patch provides real- time backup of all inpatient medication activities on a designated workstation. Review the patch description to learn more about the benefits of this patch. |





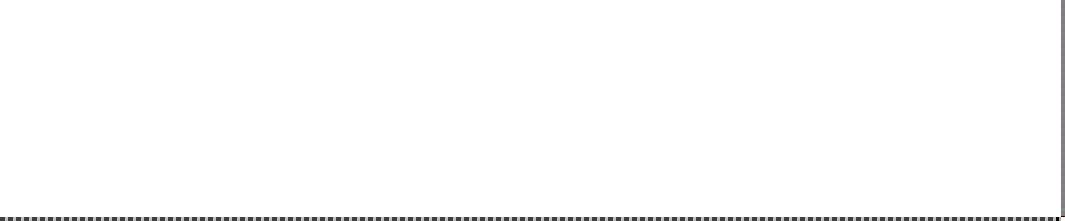
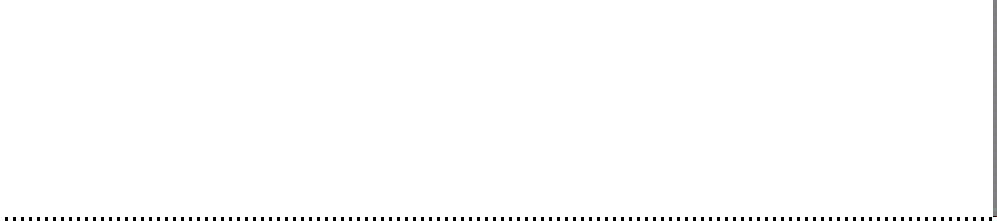
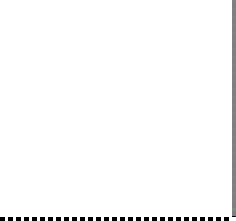
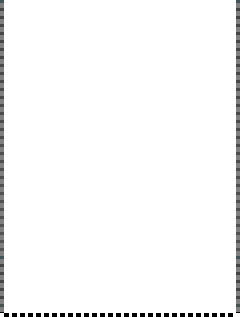
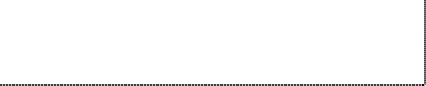
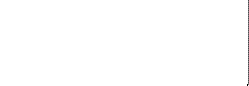
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| **Sample HL7 Data Fields Broadcast to BCMA Subscribers** | BCMA includes the Standards from the HL7 V. 2.4 (VistA Messaging) package. For more information, refer to the VistA Messaging and Interface Services Web site at: REDACTED This section provides a list of sample Health Level Seven (HL7) data fields that BCMA broadcasts to BCMA HL7 subscribers. Review the information to learn the “RAS” messages created for the administration and/or update of a medication order. The activities, which cause the broadcast of BCMA HL7 messages, are called “trigger events.” BCMA HL7 trigger events are MEDPASS, UPDATE STATUS, PRN EFFECTIVENESS, and ADD COMMENT.  **Note:** Every message will not use every data field and every segment provided. Some segments may repeat as necessary. Some segments  may not appear in the exact order depicted below for all trigger events, but they will be consistent for each specific trigger event. |

**Example: “RAS” Messages Created for the Administration of a Medication Order**

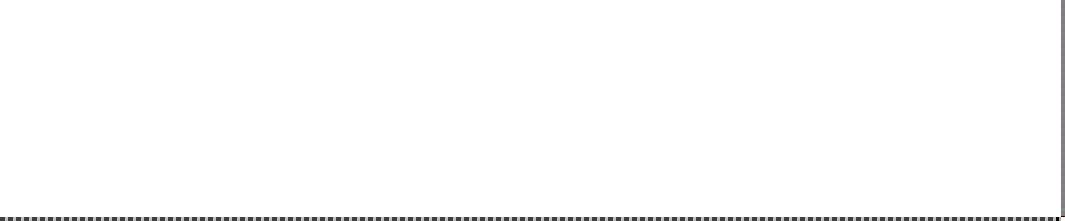
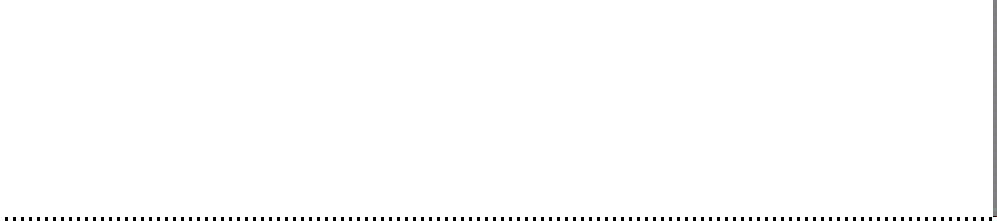
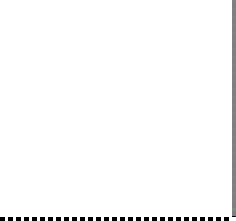
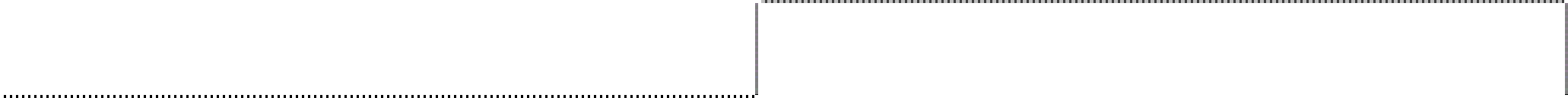


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| --- | --- | --- | --- | --- |
| **SEG** | **SEQ** | **Field Name** | **Example** | **HL7 Type** |
|  | | | | |
| MSH | 1 | Field Separator | ^ | string |
|  | 2 | Encoding Characters | ~|\& | string |
|  | 3 | Sending Application | PSB HL7 SRV | hierarchic designator |
|  | 4 | Sending Facility |  | hierarchic designator |
|  | 5 | Receiving Application | PSB HL7 SUB | hierarchic designator |
|  | 6 | Receiving Facility |  | hierarchic designator |
|  | 7 | D/T of Message | 20030530075514-0600 | HL7 format timestamp (yyyymmddhhnnss-0600) |
|  | 8 | Security |  | string |
|  | 9 | Message Type | RAS~O17 | composite |
|  | 10 | Message Control ID | 5001457 | string |
|  | 11 | Processing ID | P | processing type |
|  | 12 | Version ID | 2.4 | ID |
|  | 13 | Sequence Number |  | numeric |
|  | 14 | Continuation Pointer |  | string |
|  | 15 | Accept Acknowledgement Type | AL | ID |
|  | 16 | Application  Acknowledgment Type | NE | ID |
|  | 17 | Country Code | USA | ID |
|  | 18 | Character Set |  | ID |
|  | 19 | Principal Language of Message |  | coded element |





## Example: “RAS” Messages Created for the Administration of a Medication Order (cont.)

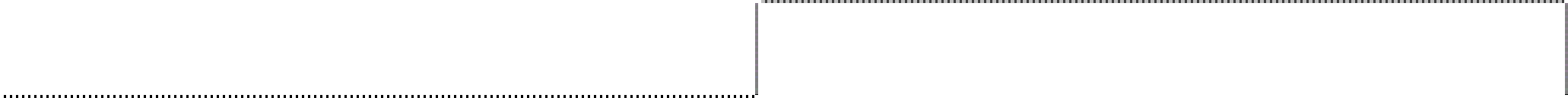


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| --- | --- | --- | --- | --- |
| **SEG** | **SEQ** | **Field Name** | **Example** | **HL7 Type** |
|  | | | | |
| PID | 3 | Patient Identifier List | 748 | composite ID |
|  | 4 | Alternate Patient ID | 54~~~~AGE | extended composite ID |
|  | 5 | Patient Name | BCMAPATIENT~TWO | patient name |
|  | 7 | Date/Time of Birth | 19490101 | HL7 format timestamp (yyyymmdd) |
|  | 8 | Administrative Sex | M | user table |
|  | 19 | SSN Number (VA)  or HRN Number (IHS)– Patient | 000001000 (VA)  or 123456 (IHS) | string |
| PV1 | 2 | Patient Class | U | table 0004 |
|  | 3 | Patient Location | 7A GEN MED 724-A~~~500 | user table |
|  | 7 | Attending Doctor | BCMAPROVIDER~ONE | composite ID |
| ORC | 1 | Order Control | XX | table 119 |
|  | 2 | Placer Order Number | 1045~PSB~1045~IEN | entity identifier |
|  | 3 | Filler Order Number | 13V | entity identifier |
|  | 7 | Quantity/Timing | ~~~~~~~~~C | dosage, scheduled  administration time, schedule type |
|  | 8 | Parent | ~ | composite |
|  | 9 | D/T of Transaction | 20030530075514-0600 | HL7 format timestamp  (yyyymmddhhnnss-0600) |
|  | 10 | Entered by | BCMANURSE~ONE | extended composite name |
|  | 15 | Order Effective D/T | 20030530075514-0600 | HL7 format timestamp  (yyyymmddhhnnss-0600) |
|  | 19 | Action By | BCMANURSE~ONE | extended composite name |
| RXR | 1 | Route | IV | table 0162 |
|  | 2 | Administration Site | 3 INJECTION SITE | table 0163 |
| RXO | 1 | Requested Give Code | 269~FLUOROURACIL | coded element |
|  | 2 | Requested Give Amount |  | numeric |
|  | 10 | Requested Dispense Code | 748V52 | coded element |
|  | 21 | Requested Give Rate Amount | ~250 ml/hr | string |





**Example: “RAS” Messages Created for the Administration of a Medication Order (cont.)**



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| --- | --- | --- | --- | --- |
| **SEG** | **SEQ** | **Field Name** | **Example** | **HL7 Type** |
|  | | | | |
| RXC | 1 | RX Component Type | A | table 0166 |
|  | 2 | Component Code | 20~5-FLUOURACIL | coded element |
|  | 3 | Component Amount | 5-FLUOURACIL | numeric |
|  | 4 | Component Units |  | coded element |
| RXC | 1 | RX Component Type | B | table 0166 |
|  | 2 | Component Code | 8~AMINO ACID SOLUTION  8.5% | coded element |
|  | 3 | Component Amount | AMINO ACID SOLUTION 8.5% | numeric |
|  | 4 | Component Units |  | coded element |
| RXA | 1 | Give Sub-ID Counter | 0 | number |
|  | 2 | Administration Sub-ID  Counter | 1 | number |
|  | 3 | Date/Time Start of Administration | 20030530075514-0600 | HL7 format timestamp (yyyymmddhhnnss-0600) |
|  | 5 | Administered Code | 20~5-FLUOURACIL | coded element |
|  | 6 | Administered Amount | 450 MG | number |
|  | 7 | Administered Unit |  |  |
|  | 9 | Administration Notes |  | coded element |
|  | 18 | Substance/Treatment Refusal Reason | ~Elevated Blood Sugar | coded element |
|  | 19 | Indication | ~ | coded element |
|  | 20 | Completion Status | C | user table |
| NTE | 2 | Source of Comment |  | table 105 |
|  | 3 | Comment | This is a comment … | free text |
|  | 4 | Comment Type | BCMANURSE~ONE~20030 530075514-0600~Date  Entered | coded element  (includes HL7 format timestamp [yyyymmddhhnnss-0600]) |

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| **Definitions of Data Fields Under FIELD NAME Column** | This section lists the definitions for some of the data fields provided under the FIELD NAME column, along with the location of the data field. The message header (i.e., the MSH segment) is constructed and supported by the VistA HL7 message development tool.  **Note:** The MSH segment field names are *not* described below.   * **PATIENT ID:** Field (#.01) of the BCMA MEDICATION LOG file (#53.79) and Internal Entry Number (IEN) pointer to the PATIENT file (#2). * **PATIENT NAME:** As returned by the Application Program Interface (API) VADPT. * **DATE OF BIRTH:** As returned by the API VADPT. * **ADMINISTRATIVE SEX:** As returned by the API VADPT. * **SSN NUMBER (VA) or HRN NUMBER (IHS):** As returned by the API VADPT. * **PATIENT LOCATION:** Field (#.02) of the BCMA MEDICATION LOG file (#53.79), which contains the actual room-bed and ward location of the patient at the time the medication pass occurred. Also contains field (#.03) of the BCMA MEDICATION LOG file (#53.79), which contains the division number of the ward that the patient was on during the medication pass. * **PLACER ORDER NUMBER:** IEN for the BCMA MEDICATION LOG file (#53.79). * **FILLER ORDER NUMBER:** Contains the ORDER REFERENCE NUMBER field (#.11) of the BCMA MEDICATION LOG file (#53.79), which contains the IEN of the actual medication order from the PHARMACY PATIENT file (#55)PREVIOUS ORDER NUMBER as returned by the API PSJBCMA1. * **QUANTITY/TIMING:** Contains the order dosage, schedule type, and scheduled administration time data from the BCMA MEDICATION LOG file (#53.79), fields #.15, #.12, and #.13 respectively. * **PARENT:** Contains the PREVIOUS ORDER NUMBER as returned by the PSB routine PSBVT. * **DATE/TIME OF TRANSACTION:** Contains the ACTION DATE/TIME field (#.06) of the BCMA MEDICATION LOG file (#53.79), which contains the FileMan date/time of the actual time that the action was taken. |