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CSC

# Medical Management

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## Process Analysis Study Report

**William O. Glascoe III, PMP and William G Steele**

**10/28/2011**

Answers to seven of the Military Health System's medical management questions regarding 1) health information technologies 2) best healthcare processes 3) standing operating procedures 4) health information system acquisitions 5) IT strategies 6) recommendations for change and 7) rough order of magnitude costs for more process analyses are described.

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## Executive Summary

The integration of the AudioCommunicator<sup>®</sup>-Disease Management COTS product with the Managed Support Contractors' (MCSC) Clinical Care System (CCS), the acquisition Referral Management Performance Monitoring Tool (RMPMT) and the initiation of a comprehensive education & training campaign for providers and patients represent the best way ahead to address the challenges outlined in this study. Our analysis indicates the cycle time delays caused by patients slow to make appointments and providers slow to send clear and legible reports (CLR) account for more than half of referral lifetime. The use of disparate systems and processes to extract, transform and load data between IT applications account for second largest cycle delay. A varied vocabulary for referral management is but one factor in the differences between referral management offices.

We found only seven common modifiers of “referral” in the US Air Force (USAF) Referral Management Center (RMC) Users Guide Version 7 (v7) and Joint Task Force (JTF) Capital Medical (CapMed) Region’s nascent Integrated Referral Management and Appointing Center (IRMAC) Concept of Operations (CONOPS), which use a total of 81 different modifiers of referral! We consider this significant because a common vocabulary is essential to simplification and standardization with Health Information Technology (IT) applications. Furthermore, knowledge management depends on a shared glossary to communicate between man and machine so reconciling the language of referral management across organizations should be a high priority that will result in a written body of knowledge of consistent word usage.

We interviewed Senior Physician Advisors to the AMEDD CIO, Referral Managers, Case Managers, Care Coordinators, and various Medical Program Managers while requesting process efficiency data and reading MHS-related documents looking for quantified medical management and specifically referral management process improvements. Unfortunately, the data do not exist and we saw no changes occurring to establish measurement systems for continual service improvement as in the base lining and benchmarking referral management efficiencies—cost, time, effort, data, network and application. We heard about the secure messaging (i.e., pre-authorizations) initiatives at the Madigan Medical Center with TRIWEST using Network Care Tracker. And we read OASD(HA) policies to streamline referral processing by deploying the Integrated Clinical Database (ICDB) application suite, CarePoint; and the AudioCommunicator<sup>®</sup>-Disease Management COTS product for reminding patients to make appointments and disseminate time sensitive information.

The beneficiaries who warrant a Care Coordinator or Case Manager because of their illness and debilitating conditions seem to be without an IT solution for their unique duties and responsibilities regarding coordinating care and managing cases. These professionals have access to CHCS, AHLTA and other clinical data systems to view, query and export data to mashup in custom spreadsheets or databases tuned for their workflows. These professionals, while short on discretionary time during the work day, need to build Use & Business Cases for several Request For Change (RFC) to health IT systems to address the structural inefficiencies in their health IT portfolio. We think manpower requirements will grow slower with rising patient populations if the RFCs are timely and successful. Instead of buying more labor to condition and exchange data between health IT applications, use those funds to restructure the health IT solution so end users are doing everything but mundane data management essential for patient safety. We understand,

soliciting requirements, Use Cases and Business Cases is inherent to the Health IT acquisition not clinical community but our experience of not having a single, approved & funded business case, signed off use case or validated requirements document proffered to us after interviewing stakeholders for two months leaves us with but one impression.

In order to manage referrals one needs to have an agreement and/or a target, an instrumented system to measure performance, and terms & conditions to incent achievement and avoid violations. We could not find these basic elements for referral management when taking the perspective of the referral lifetime—creation to disposition regardless of who performs the steps in the processes. We did find these elements in fragments of the referral lifetime embodied in the managed care support contracts, IRMAC CONOPS and USAF RMC UG v7, which explained our inability to find a single office or individual with the enterprise –wide situational awareness of referrals in near real-time. Assuming a “high-touch” model of referral management continues in this era of semantic processing and decision support capability, the Military Health System (MHS) needs to quantify its Health IT vision for RM based on referral processing efficiencies whose costs are mostly variable and in direct proportion to the number but not distribution (type or geographic) of referrals requested. Consider the following statement an example of quantifying referral management.

*In CY2010 there were 20 million referrals ordered for 9.567 million beneficiaries where the referral mean lifetime was 14 calendar days between 443,872 providers that exchanged 25.009 TB via VOIP calls, electronic messages, file transfers and ancillary digital communications of which 20.871 TB are at rest and cost (fully loaded) \$2,000,000 or \$0.0999 per referral to retain this CY. The cost of all previous years referral data (~1,000 TB compressed) retained during CY2010 was \$100K (\$.10/GB the mean of offline, near-line and online storage and transmission costs).*

The preceding statement is possible only when the bookkeeping and financial systems are deeply integrated with every other MHS data system accounting for the assignment, apportionment, allotment, allocation, disposition, and consumption of resources and capabilities in referral management. We think the Herculean effort to achieve the FY2017 DoD clean audit is the window to initiate the integration and interoperability between Health IT and every other data system for autonomic enterprise summaries—cost, human effort, ...energy, consumables, performance, etc.

We propose the next phase of work should be to define and specify an enterprise-wide network and application modeling & simulation environment for the MHS’s Chief Medical Information Officers (CMIO), who sponsors Health IT activities:

- Strategy
- Research & Development
- Demonstration projects
- Pilot projects
- Acquisition
- Operations

- Continual Service Improvement

We think the OASD(HA) needs to consider a strategy of “low touch” referral management where beneficiaries rarely interact with Referral Management Office (or Referral Coordination Center or Referral Management Center) personnel. There are 200 unique referrals (i.e., direction, patient and provider combinations) yet 20 million occurrences amongst 10 million beneficiaries annually, which average out to 200,000 of each referral type per annum. Assuming access to the data unlike what we experienced in this study, we think the “big data” associated with these statistics are promising for conducting an experiment with a digital system model of new medical management platforms that obviate the referral management entity as you know it.

# Introduction

## Introduction

In July 2011, CSC Federal Consulting Practice in Falls Church, VA was chosen by its Army Programs Division, both in the North American Public Sector, to perform the work as stated by the US Army G8 (Army Studies Program) and the Army's Office of the Surgeon General regarding Medical Management. The Director, Clinical Operations at Winn Army Community Hospital at Fort Stewart, GA was the Contracting Officer Technical Representative (COTR) and the Contracting Officer Representative (COR) was a Project Manager out of the Enterprise Solutions Competency Center at Fort Belvoir, VA.

This report answers seven questions after gathering insights, opinions, facts and figures via interviews and literature reviews. The report also has commentary about general observations made during the 12-week period of performance. The first two appendices contain the correspondence between the authors and those with data and/or information thought valuable to analyze the processes for medical management. The last appendix contains Unified Modeling Language 2 diagrams of some but not all medical management processes.

## Background

The Military Health System is under Congressional pressure to bend the curve downward on the alarming cost growth per capita to deliver healthcare [1]. The Assistant Secretary of Defense for Health Affairs, Dr. Jonathan Woodson reported to Congress the standardization on the Integrated Clinical Database (ICDB) will streamline administrative costs [2]. The TRICARE Management Activity (TMA) under the OASD(HA) administers the multi-billion dollar, multi-year Managed Care Support Contracts that bridge the Purchased Care System (PCS) and the Direct Care System (DCS). There are three Managed Care Support Contractors (MCSC); one for each of the three regions (i.e., west, north and south) the TMA has divided the Continental United States (CONUS) [3]. The consequence of the T3 contract requirements and the winning independent MCSCs solutions is no low level standardization and interoperability of data systems for the MHS beneficiaries' healthcare administration. In other words, no one at the top in TMA can go to a healthcare intelligence platform (i.e., web page) and watch "the numbers" change by the visit, test result, procedure or payment for all MHS beneficiaries like we can watch any stock price on any stock exchange fluctuate during a day of trading. And there is no reason why the MHS infostructure and IT infrastructure cannot provide that near real-time updates to a healthcare management activity with near real-time control authority to response to variations.

The numbers of and integration of health IT solutions for administering healthcare via the DCS and PCS to the MHS's 9.6 million beneficiaries are not interoperable and thus does not provide a total asset visibility nor a platform to control enterprise-wide operating parameters. Lacking the total inventory and interfaces makes enterprise IT changes difficult at best and slow to deploy. Nonetheless, there are positive controls and situational acquisition awareness of the mission-critical IT systems in the MHS portfolio [4].

There are a lot of inertia in the IT infrastructure and ubiquitous deployment of IT systems, solutions and practices are governed by the limitations and constraints of each MCSC's contract and the Armed Service who funds, staffs and/or operationally controls the Military Medical

Treatment Facility (MTF). The consequence is beneficiaries and providers who do move across the boundaries of TMA's regions and MTF's service areas experience administrative variations for healthcare. Simplification and standardization are the fundamental principles for streamlining large complex systems like the MHS but it has yet to make the seismic shifts in infrastructure both physical, informational and via indoctrination to this end.

## Scope

The scope of this 10-week process analysis was limited to answering seven questions in the next section to best of our ability given limited access to key personnel and data that supported their claims and perceptions of the best practices for medical management.

We learned the evidence of optimal, maximal and efficient medical management is not quantified but generally defined by inequalities: fewer faxes, fewer call-seconds, fewer no-shows for appointments, fewer mouse clicks & keystrokes, fewer words read, fewer administrative personnel etcetera per thousand referrals than personnel memory can recall. The issue we realized early on was the absence of SMART goals for medical management efficiency that we consider essential for Medical Managers to manage to! Participants talked about their Healthcare Effectiveness Data and Information Set (HEDIS) values, their adoption of the Integrated Clinical Database and their gap filling custom applications. They didn't talk about the missing application integrations, interfaces and web services to eliminate highly repetitive, error-prone, manual data entry between applications. Moreover, they didn't have a living roadmap of what data exchanges are worth tackling with application integration in priority order based on statistics defined by clinical categories and beneficiaries' chronic versus episodic ill health conditions.

The COTR summarized the scope of this process analysis this way.

“Our goal is to identify the next round of improvements that we should request for ICDB to optimize Medical Management at the MTF and clinic level as part of the patient centered medical home.

Additionally, we are creating process maps, sops, checklists, reports, business rules for each of the key people involved in Medical Management (care coordinator, case manager, PCM, clinic nurses, referral management shop, utilization management?, etc). The goal is to give the MTFs resources to follow to help them achieve excellence.” ---MAJ Christian Nelson

## Study Method

### Introduction

There were seven questions to be addressed by the process analysis:

1. Is there an existing application in use by or licensed to the Army or other government service that meets the needs outlined in the Scope above?
2. What solutions are various MTFs implementing?
3. What are the best practices of these solutions?

4. Are any of those applications/best practices capable of meeting the needs of this study as outlined in the Scope of the PWS?
5. What is the best solution to meeting the Scope outlined in the PWS?
6. Is the proposed solution capable of interfacing with current AMEDD hardware and software?
7. What is the Rough Order of Magnitude (ROM) to perform the next phase of work?

## Work breakdown structure

In the beginning, work was broken down into three phases:

1. Conduct Industry Overview
  - a. CSC Research & Industry Experts
  - b. Interview TriCare Experts (top MTFs)
  - c. Contact Software Vendors
2. Profile Top Solutions
  - a. Profile Top MTF Solutions & Best Practices
  - b. Profile comparable organizations solutions & best Practices
3. Form Recommendation
  - a. Create “short list” of top choices
  - b. Build business case

A new project leader replaced the one who voluntarily left CSC two weeks into the study. The project schedule based on the original work breakdown structure was modified by placing a heavy focus on analyzing the US Air Force’s Referral Management Users Guide v7 and the newly formed Joint Task Force (JTF) Capital Medical (CapMed) Region Integrated Referral Management and Appointing Center (IRMAC) Concept of Operations (CONOPS). We continued to conduct phone interviews with medical management officials who would talk to us. We did not have an ordered list of officials and key personnel to interview at the start so we solicited names of stakeholders and also discovered people to interview from ongoing internet research. The COTR and COR often had to legitimize our inquiries and requests for interviews, documents and data.

## Question and Answer 1

Is there an application in use by or licensed to the Army or other Government Service that meets the needs outlined in the Scope?

The short answer is there is **no** application in use by or licensed to the Army or other Government Service that meets the needs outlined in the Scope. We interviewed senior personnel who has cognizance over the Armed Services MTFs Health IT policies, acquisitions, operations, technology demonstrations, pilot projects, and research & development by Service level organizations to avoid contacting each of the 200+ MTFs.

Our phone interview the Senior Physician to the AMEDD CIO, OTSG, Terry Newton MD revealed that fact from the Army’s perspective. Terry mentioned there are 12 OTSG level

requirements that have been validate for funding when it becomes available. Our phone interviews with the USAF Referral Management Program Consultant & Access to Care Consultant, Ms. Marissa Koch, revealed that fact from the USAF's perspective. The USAF is the Executive Agent for the Integrated Clinical Database (ICDB/CarePoint), the program the ASD(HA) dictated via a policy memo would be the standard application deployed throughout the MHS. Our interview with CAPT Andrew Spencer, Associated Director, Public Health Services, Naval Portsmouth & Program Manager, Navy Enterprise Nursing Procedure Manual, revealed that fact from the Navy's perspective. An OASD(HA) TRICARE Management Activity (TMA) Senior Requirements Analyst, Clinical Information Management (IM) and retired Army Colonel Nurse, Patricia Kinder, essentially told us no single application suite meets the needs outlined in the scope.

The scope as outlined in the PWS was paraphrase in following six questions

1. What software features do you have that render or display a manager's goal in near real-time (e.g., care execution as it's quantitatively defined from elements of a master data model) when the execution occurs in many rooms on many floors across many buildings on different installations in a geographical region (i.e., end users' data entry on end systems of a metropolitan area network)?
2. What software features and functions do you have for referring providers and referral managers to query or be notified of patient encounters or no shows in near real time with in-network and/or out-of-network providers at their treatment facilities?
3. What software features and functions do you have to eliminate or significantly reduce the effort and wall clock time it takes referred providers to send the clear and legible report per patient encounter to the referring provider and/or referral management office or referral management center (RMO | RMC)?
4. What design pattern(s) do you have and have used for transforming faxes from referred providers into notifications to referring providers and RMO or RMC in near real-time?
5. How do you index and render or display CLRs so referring providers can quickly query report data and / or metadata for treatment planning?
6. What software features and functions do you have to effectuate disease management and utilization management for user-defined sub-populations using EHR, which is composed of CLRs?

We interviewed Epic Systems because they are under with the US Coast Guard to deploy a Health IT solution in 2012. Unfortunately, the TRICARE contracts with the MCSC would have to be modified to require them to integrate a solution like Epic's products. Epic told us that the best value of their offerings is realized when all providers and healthcare managers work off a single database application. Data visibility as a function of the application will keep data secure from those who should not have visibility.

No application in use by or licensed to the Army meets the needs outlined in the scope<sup>1</sup>.

	CHCS	Healthnet CCS	AHLTA	TriCare Online	ART (benefit advisors)	MMT	CarePoint (RMS)	Zimbra	AKO	CarePoint (RMSTR)	AudioCOMMUNICATOR	Network Tracker
CHCS		☺	API			☺	API	☺	☺	API	API	IM
Healthnet CCS	☺		☺	☺								
AHLTA	API	☺		☺								
TriCare Online		☺	☺		☺							
ART (benefit advisors)				☺								
MMT	☺											
CarePoint (RMS)	API											
Zimbra	☺											
AKO	☺											
CarePoint (RMSTR)	<b>API</b>											
AudioCOMMUNICATOR	<b>API</b>											
Network Tracker	<b>IM</b>											

API = Application Program Interface

☺ = Human connection between applications. (no API or IM being used)

IM = Integration Middleware (e.g. screen scrape)

By introducing an automated integration (e.g. API or 3<sup>rd</sup> party product) between applications that are commonly used together, a reduction of cycle time and step effort is realized. The use of multiple applications *is* required in order to complete specific referral management activities (e.g. input CLR). If applications are integrated, then data can flow from one application to others seamlessly (e.g. labs and rads entered in AHLTA are sent into CHCS). If applications are not integrated then workers must read and transpose, attach, or reference data from multiple applications. Time is spent logging in and out of disparate apps. Time is spent manually populating data from one application to another. Mistakes are unintentionally made with “human integration” – quality can be affected.

We recommend:

1. Analyze applications’ designs and implementations for integration risks and costs of secure interoperability.
2. Insert COTS software after evaluating it in a trusted or responsible software integration & test facility. Control the [documents] artifacts from integration and testing even for the software application you did not purchase or release into the operational environment.

## Question and Answer 2

What solutions are various MTFs implementing?

The AMEDD website lists 27 medical treatment facilities and we visited one for a total of 8 hours to witness referral management in action. There can be seven, sometime more, different job positions (i.e., referring provider, referred provider, RMC clinical reviewer, RMC non-clinical reviewer, MCSC specialist, patient, and referred provider’s front desk appointment clerk) required to execute a path through a referral process. We only spend time with just one, a RMC registered nurse.

When you ask this question to a RCC/RMC/RMO Director, Manager, Chief or Officer you are not handed get a document (i.e., Referral Management Solution Description) that maps people, technology and process at the data element level for operations and administration of consults and referrals. The same goes for higher level Officers (i.e., CMIO, CIO, CTO, ...) of the MTF. There lies a basic question for executive management in general. Is there are need to standardize the living descriptions of solutions for inquires and studies such as this one? We believe the answer is yes and the DoD Architecture Framework is a standard implemented in several COTS software products to use. The education and training of process owners, technology architectures and HR specialists to initialize and sustain the many views of the DoD AF requires significant commitment in the way of budget for licenses and coordination of actors, activities and artifacts that are serialized, controlled and inspected.

### **Integrated Clinical Database**

The Assistant Secretary of Defense (Health Affairs), Dr. Jonathan Woodson, reported to Congress, 21 Jan 2011 the next generation of TRICARE contracts will have the MHS using the Air Force's Integrated Clinical Database (ICDB) on an interim basis to streamline referral processing operations using the Referral Management System (RMS) [1].

Of the 266 MTFs in the Tricare online directory, we did not attempt to confirm how many have complied with the OASD(HA)/TMA policy. The Navy's memo dated 16 Feb 2011 on this subject (IMPLEMENTATION OF THE INTEGRATED CLINICAL DATABASE (ICDB)/REFERRAL MANAGEMENT SYSTEM TRACKING REPORT (RMSTR) FOR CLEAR AND LEGIBLE REPORTING (CLR)) to its four medicine commanders states as of 01 Apr 2011, the use of ICDB/RMSTR is required for all Navy TRICARE North Region MTFs. The next generation of TRICARE contracts (T3) changed the consultation processing responsibility from MCSCs to the respective MTF.

We can only assume the Air Force and Army have followed suite with similar policy memos for their TRICARE North Region MTFs. We asked the Air Force for the cost structure of the ICDB but LtCol Lamb did not acknowledge it and we have no idea of how much the ICDB/CarePoint Suite of 15 applications cost items are or how much has been spent per approved Request for Change (RFC).

Marrissa Koch shared the MHS Conference 2012 breakout session proposal submitted under Maj Rhodes name, which describes a software acquisition in the ICDB Program Office. This topic is related to the following MHS Conference tracks: Integrated Purchased Care, Health Information Technology and Accountable Care –Integrated Delivery Systems. The Referral Management Performance Management Tool (RMPMT) will likely be standardized by the OASD(HA) if not assumed to be because of its RMSTR heritage.

<p>The AFMS Referral Management Performance Measurement Tool (RMPMT) is a health information application that provides leaders and decision-makers global oversight and data on referral management processes and practices at their facility, intermediary Command, and Service. RMPMT provides data on referral numbers by product line and metrics on facility referral processing, enabling transparency and accountability on target areas for improvement and cost avoidance. The RMPMT cannot display patient health information. The RMPMT creates graphs on</p>
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the criterion selected and user's can extract data to spreadsheets.

The reports available on RMPMT include: the Aggregate Referral Report, Purchased Care Referrals Report, Direct Care Access To Care Report, Disposition Report (tracks days from order to review, to booking, to appointing), Total Right of First Refusal (RORF) Report (shows all ROFRs sent to MTF, accepted, declined, and booked, and kept by priority, by specialty), and the Purchased Care Cost Report (to include primary care urgent visit referrals) report. By providing this data at the user's desk top in near real time (daily refresh), leaders will be better informed on referral patterns and processes that can identify areas/tactics for better integrate care and reduce health care costs.

### **Network Care Tracker**

The US Army's Network Care Tracker developed at the US Army's Madigan Medical Center with seed money from TATRC nearly 5 years ago has become a unique capability because of its integration with its MCSC's Comprehensive Care System (CCS). Arguably, without violating any contract provisions, Richard Barnhill's informatics group has acted on the patterns of behavior only known by mining big data in TRIWEST's CCS. Not knowing the exact figures, the two of them have implemented secure messaging to automatically authorize a small set of referrals by content and significantly reduced the cycle time compared to human review. Because each MCSC is independent of the other, the ability of the North and South TRICARE Region MTFs to emulate this [best] practice is subject to their leaders' initiative to reach out and negotiate within the bounds of the MCSC contracts.

### **AudioCare AudioCommunicator®-Disease Management**

AudioCommunicator®-DM (AC-DM) is rolling out to all MTFs thanks to the TMA purchase of a license for the DCS. The AC-DM will give back precious minutes and hours to RM staff by automating the call reminders to patients with open referrals older than X number days per TMA policy [4]. The MTFs Referral Management personnel have been trained on configuring and optimizing the AC-DM based on their patient population. Many expect the percentage of unused referrals to drop significantly from the 25% today with this MHS deployment.

## **Question and Answer 3**

What are the best practices of these solutions?

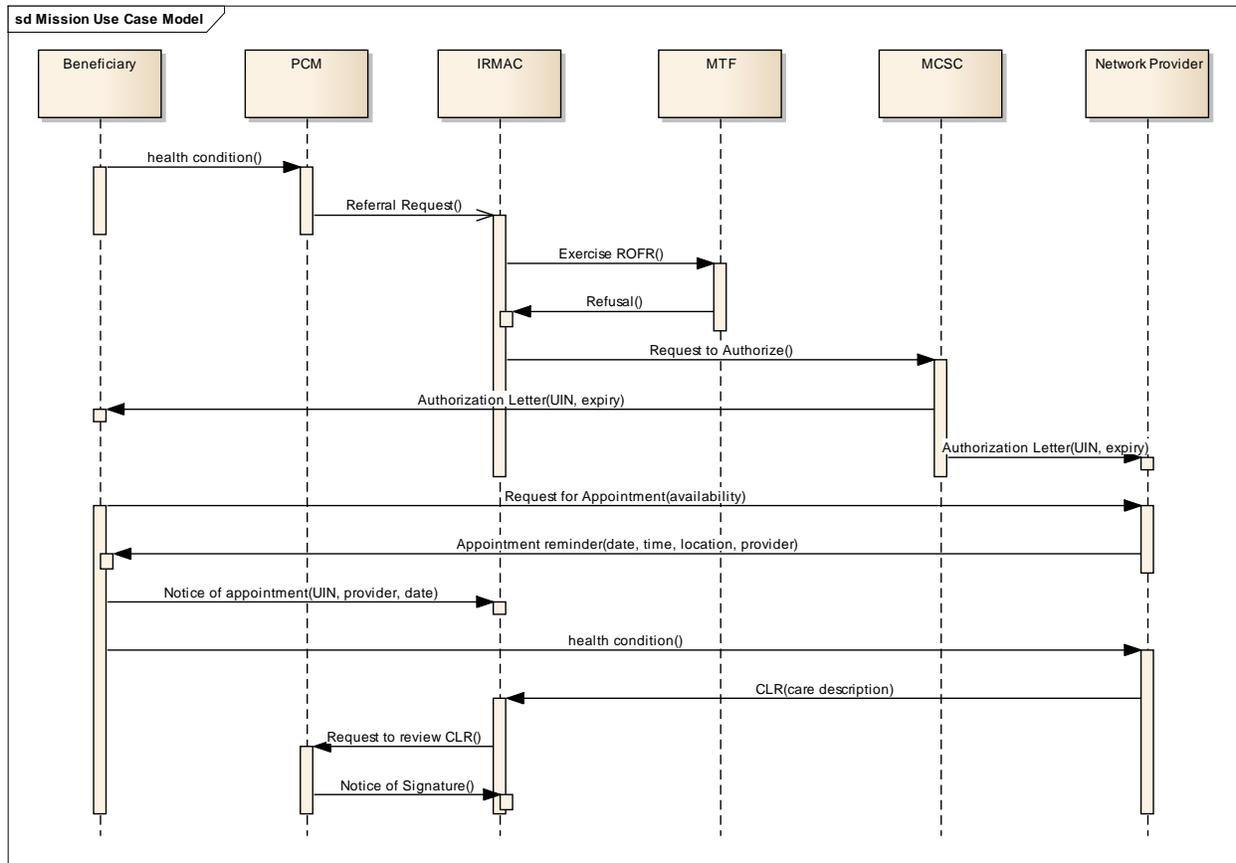
Call the providers before the patients but call both to resolve delinquencies.

Use the process of elimination to know if an event has occurred by a patient or provider.

Profile providers' reaction times and idiosyncrasies to set expectations and anticipate delinquencies.

Educate and promote remote access to FAQ answers

IRMAC Practices per its CONOPS



## Question and Answer 4

Are any of those applications/best practices capable of meeting the needs of this study as outlined in the Scope above?

If the AC-DM application is integrated with the CHCS and MCSC portals that have the master patient and provider lists of outstanding actions in the referral workflow, then it can meet the needs of this study. Patients or their proxies (non-medical attending, Case Manager, Care Coordinator, Social Worker, etc.) have responsibilities to act when able in the referral workflow. Sometimes they do not as soon as the opportunity is available. AC-DM might be configured to communicate with them after a grace period determined by local Medical Management to do so. The same can be said for the providers in the Purchase Care and Direct Care Systems have not submitted Clear and Legible Reports not overdue.

## Question and Answer 5

What is the best solution to meeting the Scope outlined above?

The

Open	2 - 5 min
Review: DCS specialty	1 - 15 min
ROFR	30 min - 24 hrs
Accepted	30 min - 28 days
Deferred	24 hrs
Review: RMC	5 min - 2 mos
Authorized	72 hrs
Un-authorized	72 hrs
Appointed	expiry date - current date
Un-appointed	expiry date - current date
Unused	expiry date - current date
Used	15 min - 12 hrs
Unresolved	expiry date - encounter date
Closed	infinity

- replacing
- simplifying
- standardizing
- redesigning
- reorganizing
- restructuring
- reformatting
- innovating
- eliminating
- reducing
- supplementing

the extant structural and behavioral components of the AMEDD IM/IT systems we can study and observe.

Automate ## manual tasks that care coordinators, case managers, referral managers, appointing clerks, utilization managers and disease managers perform.

Manual tasks	Cycle Time	Recommendations	Cycle Time
Schedule appointments within ATC standards unless patient waives right to them (p 5, b.i.)	5 min	Self-service appointing like in the airline industry but the referring provider et al with a need to know receives electronic notification (of their choice: email, SMS, etc.) of appointment object through its lifecycle (i.e., reschedule, sign-in DTG, sign-out DTG, cancelation, follow-up appointment DTG, etc.)	

## Question and Answer 6

Is the proposed solution capable of interfacing with current AMEDD hardware and software?

We propose in Answer #7 that work be performed to present all the AMEDD hardware and software interfaces in a readily accessible (i.e., near transparent) platform via a XML-based format offered by any one of many desktop (i.e., thick client) architectural modeling tools.

Our non-material solution is a comprehensive education and training campaign for providers and patients to eliminate the human tendency to ignore or disregard the following for the sake of working on tasks other than those for medical management.

- checklist discipline
- procedural requirements
- terms of agreement
- professional standards and courtesies
- industry best practices
- process guidance

Current AMEDD hardware and software external interfaces are not affected by implementing such a campaign. The standard [instructional] content could be delivered via extant software user interfaces as part of upgraded COTS/GOTS software help systems. Otherwise, the instruction should be delivered by face-to-face conversations in the normal course of doing business, PCS and DCS web sites, YouTube, iTunes, and social media sites like Facebook that local surveys indicate are effective and efficient at reaching beneficiaries. The change you want occurs one patient's encounter at a time, and if the entire 9.6M beneficiaries are referred to secondary in or out of the DCS at least once per year, you know everyone of the 380,000 PCS providers will get the message.<sup>1</sup> Similar to the success of decreasing the no show appointment rate at Winn Army Community Hospital by informing the Active Duty Service Members immediate chain of command of the member's appointment, the target list of providers not submitting CRLs on time if at all will become targets for face to face commitments to fulfill their duty via beneficiaries known to frequent their practice. Peer pressure in the form of leveraging a trusted relationship between patient and provider might be effective at changing behavior in lieu of increasing the health IT footprint on both sides of the transaction. Reformatting the authorization letter and even supplementing it with physical items as reminders to ask and demand a commitment to write and send the CLR for the evaluation and treatment as if it was a personal exchange, not a professional one could be surprisingly effective.

In general, the basis for answering this question in the affirmative for any solutions should be on the results of accredited digital simulation models and simulation results when access to test versions of deployed systems & software are not extant, available and/or affordable to integrate and test. We are aware of the portfolio for advanced research and development via demonstration projects at the Telemedicine and

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<sup>1</sup> We asked this question of CAPT A. P. Spencer but he didn't think it is readily available because of the segregation of data required to answer it.

We effectively asked for technical and acquisition histories of extant MM software releases of all types but not replies with data and documents were forthcoming.

## Question and Answer 7

What is the Rough Order of Magnitude (ROM) cost for the next phase of work?

The next phase of work is based on the amended performance work statement for this study. We did not have time for coordinating a price, even for a ROM so the ROM costs are in staff-hours and based on the authors' engineering management judgment. The 5,000 staff-hour ROM cost assumes few if any barriers to access extant data we discover and is deemed by us required for creating architectural artifacts.

1. Derive requirements of a Medical Management (MM) system from the MHS CMIO's IT Service Management Strategy and Armed Services' OTSG guidance
  - a. **1,000 hours** = 100 requirements x 10 hours per requirement
2. Integrate and configuration controlled workflows in a business architecture tool (e.g., Sparx Systems Enterprise Architect v9.1) between
  - a. Care coordination
    - i. **300 hours** = 300 modeling elements x 1 hr per element
  - b. Referral management
    - i. **300 hours** = 300 modeling elements x 1 hr per element
  - c. Utilization management
    - i. **300 hours** = 300 modeling elements x 1 hr per element
  - d. Disease management
    - i. **300 hours** = 300 modeling elements x 1 hr per element
  - e. Case management
    - i. **300 hours** = 300 modeling elements x 1 hr per element
3. Discover and consolidate the AMEDD-owned, leased, licensed, controlled and/or operated IT infrastructure including software stack's Interfaces into an enterprise architecture tool (e.g., Sparx Systems enterprise architect v9.1).
  - a. **1,000 hours** - 1,000 interface points x 1 hr per interface point
4. Estimate a MHS CMIO coordinated MM system 6-year life cycle cost as of its Initial Operational Capability and Full Operational Capability.
  - a. **2,000 hours** – a function technologies' variable evolution, contracts turning over, system users turning over, master data volume and traffic patterns, policies & rules shifting and swinging

We did not have time to request, collect and consider the engineering data of the extant MHS IT infrastructure to estimate a ROM cost for a MM system. We know Kaiser Permanente spend \$4.2 billion (circa 2000 dollars) over seven years to overhaul their medical management system for its 8 million customers but we do not know what the operations and maintenance costs post Full Operational Capability, if there was such a declaration, especially in the age of continual IT

service improvement. We were told the administrative costs of MHS healthcare delivery is comingled with the cost of healthcare, which represents a significant barrier to verifiable MHS policy analysis.

The instrumentation and interest via standard reports or better yet near real-time technical intelligence dashboards for the MHS enterprise-level architects of how many data are at rest and in motion of any type at any node or link in the MHS do not exist. Consequently, models and simulations of the MHS technical architecture germane to medical management do not exist to analyze cost and service implications of transforming to alternative IT service models, technical or business architectures and designs for a given set of requirements or policies.

We suggest the federal executive leadership verify their general ledger, cost accounting, contract administration and financial systems to support the accuracy and precision of their policy analysis goals. We noticed the absence of a best guess administrative process cost growth reduction, administrative costs benchmarks and baselines with the mention of the ICDB standardization in the Report to Congress from the OASD (HA). Improve the efficiency of cost collection and transformation from the low-level work definitions (e.g., position descriptions, Contract Work Breakdown Structures, etc.) and observations (performance reports, audit reports, Inspector General reports, etc.) in the DCS and PCS to the high level before heavily investing in modeling and simulation capabilities that cannot be verified and validated without these data. Nonetheless, we suggest the follow on work be the foundational work for a MHS IT service model that is simulatable over long durations (e.g., 365 days) and/or at high accuracy and resolution (e.g., packet level and end-user experience of page load delay during peak local area network traffic—start of duty day).

## References

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2. OASD(HA), Report to Congress: *Study and Plan to Improve Military Health Care—Follow Up Report*, 21 Jan 2011.
3. OASD(HA), 2011 MHS Stakeholders Report.
4. Defense Health IT Council, MHS Investment Review Status as of August 2011.
5. TMA, INFORMATION PAPER ON IMPLEMENTING THE MHS AUDIOCOMMUNICATOR REFERRAL REMINDER, 11 May 2011.

## Appendix A Correspondence Summary

The following list of names, employee type, employer and email addresses represent the breath of our correspondence. Some people were only Cc'ed on the correspondence. The listing is in order of correspondence.

The table below summarizes the data and documents we collected from others. We reviewed dozens of documents from open sources via the Internet, which are not cited herein because they do not have the level of detail to advance the state of practice in referral management units the MTFs.

Date (2011)	Name and Title	Organization	Question	Answer
05 Aug	LtCol Wendy J Lee	AFMSA/SG30	Will you disclose correlated and illustrative behavior patterns of referrals? Will you disclose RM capacity and asset inventories? Will you disclose RM asset usage and quality data? What are the tasks for rework and the data that are re-entered because applications are not integrated? What are your unfunded requirements and wants for software and software integration?	No response.
09 Aug	Mark Lamb	AFMSA/SG	Will you provide the ICDB architecture description, database design document and application programming interface?	No response.
11 Aug	David B Anderson	WINN ACH	How much patient information should go to a network provider with an authorization?	As much as required but the 5 line limit is not worth changing; delivering a communication service that connects one provider with another the first try every time is worth it.
12 Aug	Rebecca Baker, RN, MHA, CCM, NRMC Nurse Consultant, CM, PCMH	WINN ACH	How much patient information should go to a network provider with an authorization?	More than 5 lines because we the ...standard dictates it.
16 Aug	MAJ Christian Nelson	Winn ACH	How is the bookkeeping when change occurs with software entitlements from the MHS? Do both parties retain or archive outgoing and ingoing messages/forms/requests for O&M, continual service improvement, integrated product and process development meetings?  Does your office have any visibility in to the direct submissions by end users via organizational MOUs or MOAs?  Does your office or has your office considered local user groups, virtual communities of interest to solicit end user feedback for a formal/official written submission to a software application maintenance activity?	
22 Aug	Anita L Sachs	Winn ACH	Do you have the CHCS master data model?	No.
22 Aug	LTC Camp and MAJ Moakler		Do you have cycle time and throughput data for each type of referral processed at you your MTF for the last year? What referral states and transitions do you acknowledge at your MTF?	No answer.
24 Aug	Marissa Koch	AFMSA/	Will you send us RMPMT beta software account request forms so we can	No response.

29 Aug	Marissa Koch	AFMSA/	discover what it means to manage referrals? Have you considered revising your business rules or a version of them that is composed of unambiguous "who does what, when, where, how and how often"? What is the significance of a procedure vice a process when it comes to inspecting, auditing, certifying the individual and the organization? Signatories? Recurring training hours per person? ...?	No response.
31 Aug	Marissa Koch	AFMSA/	How many non-US technologies have you evaluated over the years for the continuous improvement of referral management?	None.
02 Sep	Bill Steele	CSC NPS FCP Technical Consulting	What are the structural elements of the KACC RMC?	No data available.
06 Sep	Richard Barnhill	Madigan Medical Center	Is the nirvana of medical management defined by the absence of job titles because of long-awaited application and data integration to implement iEHR (life after ALHTA), or something else?	No answer.
07 Sep	CDR McArdie and CDR McGuire	WRNMMCB	What are the terms, phrases and concepts used with those you interact that are cause for rework, mistakes and/or confusion? What are the cycle times for repetitive tasks while using IM/IT systems to coordinate care? What is your precise input on the changes to your microcosm's structural and behavioral elements that need to occur (in priority order) to achieve the level of efficiencies you know or think is possible and sustainable?	No written response. No direct answers.
07 Sep	COL Art DeLorimier	JTF CapMed IRMAC	What are the asymptotes of performance for IM/IT and personnel for a given policy/process/procedure stack?	No response.
13 Sep	COL Art DeLorimier	JTF CapMed IRMAC	What are the answers to the questions to my mark up of your IRMAC CONCOPS?	No response. The CONOPS is not changing anytime soon.
13 Sep	COL Art DeLorimier	JTF CapMed IRMAC	What is the name of the document that has the data and information to use criterion 3 on page 14? What exactly do you collect on providers to know they have the expertise for a referral when the patient illness could be a mystery? Along those same lines, do you have access to what "right" equipment exists and is available (not in the shop for repair) for every MTF?	No response.
16 Sep	Dr. Terry J Newton	AMEDD CIO Office	What is the result of an administrative review of referrals (see page 14); some kind of report using a standard DD Form? Are reviews and artifacts generated now in the JOA? Did you read the ONC's Federal Health IT Strategic Plan 2011- 2015 (80 pp) yet? How does it compare to the MHS Strategic Plan and Action Plans? Does the AMEDD have a Health IT Strategic Plan too?	No written response.
19 Sep	Dr. Terry J Newton	AMEDD CIO Office	How many AMEDD beneficiaries (# of # of total beneficiaries in the AMEDD population) as of any given date-time group in CY2010 never had a referral or	No answer.

			consult as a MHS beneficiary as of that date-time group?	
20 Sep	Kathy Larkin	OSD TMA	1) What is the cost distribution of referrals? In other words does 96% of referrals equals 96% of cost [\$] to an MTF or civilian network provider and conversely 4% of cost to out-of-network providers? 2) What calendar period to you use to calculate the percentage? A varying contract award fee period, CY, GFY, other?	No answer.
20 Sep	IRMAC Team	JTF CapMed IRMAC	Considering the many attributes a referral has given its stage of life or processing, have you considered reducing or simplifying the number of modifiers (adjectives) to strictly control with the IM/IT language used in the displays with that used in your CONOPS?	No answer.
21 Sep	Barb	Epic Systems	Six questions (see Appendix B)	A teleconference that didn't answer the questions and no documents were proffered.
23 Sep	Rick Barnhill	Madigan Medical Center	Can you share any NCT financial structure and data?	No answer.

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51. Maj Don L Smith USAF AETC 81 MDG/SGH Case Manager
52. MAJ Chad Rodarmer USA PCMH Team FSHTX
53. Brenda Rollins CIV MEDCOM/EAMC

## **Appendix B Data and Information Requests via email**

The following excerpts represent the effort and extend we took to discover the facts, figures and relationships between Network Providers, MTFs, MCSCs and TMA; hoping indicators of best practices with any one suite of Health IT governed by ASD(HA) policies, TMA contracts, and DoD Information Assurance/Cyber Defense regulations would emerge. Nearly each of the 40+ questions below was not answered leaving us with a dearth of process execution data to analyze. The USA OTSG should have near real-time visibility of all software entitlements, configurations and assignments, if it wishes to know them, regardless of where the software is executed—data center, desktop or mobile device.

11:34 AM EST **05 Aug 2011**, LtCol Wendy J Lee USAF AFMSA/SG30

LtCol Lee,

Thanks for your time discussing the Medical Mgmt Process Study this morning.

Please send any germane data and information to MAJ Nelson and he'll release it to Bill Steele and me. I expect MAJ Nelson will suggest you send the materials to all of us at once, avoiding the FORWARDing delay.

Let me recap what data and information are germane. Correlated and illustrated behavior patterns and frequency distributions (histograms) are ideal sources but we know they are a rare find.

Capacity & Inventory data (manpower study for the roles and jobs described in the RM processes, software titles and entitlements for the RM processes, data model for RM)

Usage & Quality data (personnel performance appraisal factors for the roles and jobs described in the RM processes; anonymous scores for those factors; goal vs. actual for efficiency, throughput, cycle times in RM processes)

Rework & disintegration data (role specific rework identifiers (task names), data elements common to all the software titles used in RM processes that have to re-entered)

Requirements and Wants data (software titles' screens annotated with cycle time starting points and ending points, written descriptions of what you want measured that some application integration or new feature in extant software or new software title could bring, descriptions of artificial intelligence, reasoning, heuristics, and/or business rules you want to be able to visual[ly] program or have programmed to coach or assist role-specific account holders of RM software titles)

I look forward to collaborating with Maj Don Smith at Kessler AFB, MS on a measurement framework for Release Management.

10:48 **09 Aug 2011** LtCol Mark Lamb USAF AFMSA/SG

Lt Col Lamb,

Thanks for taking my call this morning. Bill Steele and I are performing contractors for MAJ Nelson (Administrator, Winn Army Community Hospital). Please forward my request to your ICDB Program Manager and Chief Architect so we can get familiar with the ICDB technical capabilities and architectural limitations.

Regards,

**06:06 PM 12 Aug 2011**

MAJ Nelson,

In order to reference authoritative documents, will you provide the text from the performance appraisals or job vacancy announcements or development plans or position descriptions of those deemed to be actors in the Clinical Referral Management at Winn Army Community Hospital?

We simply want to be able to cite the presence or absence of explicit and implied duties and responsibilities of MM/RM in these actors' HR documents to should how much semantic coupling is documented between people, process and technology.

Regards,

**10:19 AM 16 Aug 2011**

MAJ Nelson,

Just wondering about the history of formal correspondence between Winn ACH and MHS IM/IT Offices/Officers/PoCs when it comes to Winn's installed software applications comments, suggestions, requests, etc. How is the bookkeeping performed on such exchanges?

Do both parties retain or archive outgoing and ingoing messages/forms/requests for O&M, continual service improvement, integrated product and process development meetings?

Does your office have any visibility in to the direct submissions by end users via organizational MOUs or MOAs?

Does your office or has your office considered local user groups, virtual communities of interest to solicit end user feedback for a formal/official written submission to a software application maintenance activity?

If you have any OFFICIAL RECORDS of correspondence between your IM/IT apps' service center equivalents and Winn's end users, we would appreciate a copy just to read the language, tone and focus of the content.

Regards,

12:53 PM 22 Aug 2011

Anita L Sachs  
Anita,

Bill and I have had no exposure to CHCS yet. If you have its data model, we sure would appreciate a copy for our study. Same goes for all the user screens and the Interface Control Document (aka API).

I found 74 modifications of the word referral in the USAF's Referral Management Center Users' Guide Version 7, 08 Mar 2010. My purpose in generating the list was to reconcile the language in the Users' Guide with the data labels in IM/IT systems processing referrals and connected documents (e.g., CLR and claims). My philosophy is [to] be consistent in the prose and the software programs. No extra terms or variants if you want efficient communication. When new terms must be introduced, make a "Request For Change" for all configuration controlled containers of those terms concurrently despite the variation in implementation and deployment to the user community. At least, you covered all bases and it's just a matter of time and budget before the vocabulary is consistent across the paper policies/forms/guides/etc., person's diction and software programs.

Regards,

03:51 PM 22 Aug 2011

LTC Camp and MAJ Moakler:

Bill and I really need to witness referrals being managed and not just talk about it anymore during this study. We are primed with the basic understanding of the process, technology and people thanks to MAJ Nelson et al and study's government furnished information. We want to get as close as possible to doers making decisions using capability & capacity reports and appointment book openings; any interaction with germane auditors, inspectors and/or commissioners querying the same managed care source data for their purposes will be a bonus. The quality our process analysis study report will be directly proportional to the quality and fidelity of the experiences we have in MTFs like yours.

Bill and I are eager to collect cycle time and throughput measures for each type of priority a referral has at your MTF--STAT/ASAP, Same-Day, 24-hr, 72-hr, Routine, Provider-defined, etc. captured by your MTF and the same set deferred to the Network. We hope that the sheer volume of referral activity at your hospital will allow us to witness every state of a referral in a day's visit or two. Bill and I read the Aug 2010 USAF Referral Management Center's Users Guide and derived 16 states of a referral

1. open
2. pending
3. disapproved
4. invalid

5. approved
6. ROFR
7. accepted
8. denied
9. authorized
10. un-authorized
11. non-activated
12. activated
13. unused
14. used
15. unresolved
16. closed

We need to find out what the REAL states are in your MTF based on the diction of your personnel, the labels of your referral management IT solutions (i.e., COTS, MOTS, GOTS and Custom) and the content of your published (document-controlled) Work/Operating Instructions, Checklists, SOPs, etc. We are interested in the differences between these media and how you sustain effective and efficient communication despite any differences and during the introduction of new terms or retirement of archaic ones. Bill and I are tasked, amongst other things, to recommend and suggest improvements to MAJ Nelson in RM process as much as the enabling information technology. We are seeking Best Practices during this short study (ends 30 Sep 2011) too.

Please let me know how soon Bill and I (or just one of us) can visit your work areas to collect the needed data for this important study. I happen to be a USAFR Individual Mobilization Augmentee so I can easily get on Post. Call me anytime with any questions.

Regards,

**03:10 PM 24 Aug 2011**

Hi Marissa,

Please forward Bill and me the request forms to the beta software for the RMPT you said is in development. We really want to read the requirements document too. I know you said it's a bit dry but that's ok. We think it holds clues to what it really means to MANAGE referrals.

Regards,

**10:01 AM 29 Aug 2011**

Marissa,

I will not bother with it because the specifics are not central to our deliverables.

Have you considered revising your business rules or a version of them that is composed of unambiguous "who does what, when, where, how and how often"?

After reviewing the 200+ statements in the business rules table I found 47 phrases that could be classified as something other than a "business rule". I consider the "establishment" of something different from a business rule. I know I'm carping over the presentation of business rules but it seems clearer to separate and illustrate the business directives, processes and procedures from the business rules in them via IM/IT applications settings, features and personnel KSAs | duties & responsibilities independent of IM/IT apps.

The "rules" call for the establishment of

PROGRAMS	2 or more
PROCESSES	67 (I counted 2 when "processes" was used not knowing exactly how many of them will be established; how did you decide "a process" will suffice?)
PROCEDURES	14
DIRECTIVES	4
OFFICE LOCATIONS	1
UNKN FORMAT	1

-----  
89 things

I'm curious how do you handle (i.e., document control) 67 (sub)processes? Does a MTF have a file plan of these processes by title that we can review? If there are what I consider, business rules, buried in those 67 processes then we are looking at 100+ unique business rules.

What is the significance of a procedure vice a process when it comes to inspecting, auditing, certifying the individual and the organization? Signatories? Recurring training hours per person? ...?

- establish educational programs
- establishing a process for the CLR to be sent to medical records
- establish a process to note receipt and send to the referring provider
- establish the RMC at a location within the MTF and preferably in close proximity to the primary care clinics
- establish in writing that all referral requests must be entered in the CHCS MCP module or AHLTA order entry systems
- establish written processes that require ALL referral requests to go directly to the RMC or Multi-Service Market (MSM) Referral Center
- establish processes ensuring that the requesting provider directs the patient to the MTF RMC for referral review, instructions, appointing etc.
- establish written processes for the management of urgent/emergent specialty care referrals
- establish processes to manage and track consults for Urgent or Routine primary care IAW OASD (HA) and AF/SG3 policy
- establish processes to obtain the consult result/documentation ...
- establish processes to assist ADSMs on terminal leave ...
- establish and maintain written procedures for the RMC or MSM Referral Center to accept/identify the patient needing referral management

establish processes that guards the patient's health information (PHI) privacy IAW all applicable local, state and federal regulations

establish individual MTF referral appointing processes ...

establish processes that inform the patient of the specialty care appointment...

establish local processes for the special handling of referrals for ADSMs...

establish procedures in writing that RMCs will refer patients directly to the Patient Administration travel section

establish procedures in writing that RMCs will refer patients directly to the Patient Administration travel section...

establish processes to ensure that all referrals include sufficient clinical, administrative and authorization information...

establish processes to ensure the fullest extent of ROFR acceptance

establish a written process that ensures review and acceptance or declination of the ROFR within one business day

establish written processes to address acceptance and tracking of referral requests...

establish written processes that ensure administrative OIs, Memorandums of Understanding/Agreements

establish written appointing processes...

establish written directives that mandate that the RMC staff shall be allowed to...

establish written directives that MTF initial specialty care referral appointments are booked

establish processes in writing for how MTF/RMCs will notify patients...

establish written procedures that direct the RMC to try to book the appointment to other DCS MTFs...

establish procedures in writing that if capacity is not available at other DCS MTFs within ATC standards...

establish procedures to track appointments made to other DCS MTFs...

establish processes that the RMC or MSM Referral Center will forward via fax/electronic transmission "defer to network" specialty care referrals...

establish RMC processes in writing for monitoring and tracking of "defer to network" special tests/studies...

establish processes in writing that ensure MTF consideration/monitoring

establish MTF processes for monitoring and tracking of "defer to network" special tests/studies...

establish written processes for the management of specialty care referrals to non-network specialty care providers based on...

establish processes that when referrals are deferred to a non-network specialty care provider...

establish written processes to ensure the patient is advised

establish written processes that address the below referral statuses...

establish written processes that mandate that the RMC be the MTF's single POC...

establish written processes that referring providers are responsible for...

establish process that ensure the DCS specialist makes available his/her note/recommendations within 72 hours

establish processes that ensure that the referring provider has reviewed the completed referral results

establish processes to ensure that the RMC will return completed ROFR specialty care referral results

establish written processes to track the location and status of external specialty care and deferred primary care referral results  
establish a process to notify the referring provider that referral results are available  
establish processes to follow-up with the MCSC...  
establish written processes that address notifying the referring provider

MAY  
CAN

Regards,

06:12 AM **31 Aug 2011**

Marissa,

How many non-US technologies have you evaluated over the years for the continuous improvement of referral management? I stumbled across a UK SNOMED-CT based application yesterday (see link below) that affects referral management performance.

<http://www.mapofmedicine.com/solution/learnmore>

Clearly, national healthcare structures radically different from ours can make their strategies and solutions non-starters. I'm just wondering how much exposure, effort and accounting of the ways of others you have going on as a surveillance task. Don't know if you get to task [low cost] summer interns or direct graduate-level informatics researchers to take the deep dive and synthesize the global market's RM activities.

Regards,

08:25 AM **02 Sep 2011** for Kimbrough Ambulatory Care Center visit (Mrs. Cheryl Jones)

Bill [Steele],

Questions we want answered by probably will not get answered because the data don't exist.

Process numbering system

Process index (process ID; process full name, process related dates)

Process revision page

Process statistics (cycle time, throughput, correlations with other system variables, ...)

job descriptions of everyone who executes part or all of the processes indexed

job appraisals of everyone who executes part or all of the processes indexed

process-related education and training materials index (document ID, full name, dates)

process-related education and training materials revision page

enabling technology summary (software title, version number, release notes, group ID, account type, user account permission summary, etc.)

data structures, types, files, forms, fields and values used in processes and technologies (as explicitly documented) to manage referrals (consults, appointments, CLRs, claims, payments, etc.)

**07:49 PM 06 Sep 2011**

Mr. Barnhill,

Bill Steele and I only have time this month so we'll take your first availability.

Our medical management process analysis study implies we can quantify and qualify best practices in the context of deployed IM/IT solutions. That could mean 1) fewest data fields but the most information fields 2) referral state aware displays 3) minimal mouse clicks, keystrokes, finger taps, stylus taps, other input events 3) mobile platform accessibility (e.g., iPad2) 4) minimal referral update delay wrt appointment events and CLRs 5) shortest cycle time between any set of discrete events (states) traceable to RM processes 6) greatest throughput per employee without eventful burnout 7) etc.

We have not found any publications and documents that present the data behind the "concept of efficiency", regardless of type (e.g., cost, memory, bandwidth, time, or energy), for medical management, let alone referral management. We have some throughput numbers for the Winn Army Hospital but those data do not address the cycle time aspect of getting referrals processed.

We will appreciate your view (documented or otherwise) of critical success factors with respect to an IM/IT solution for medical referral management. I perceive the deliberate complication and variation of data types, data formats, data collection, data storage, data access, data visualization and data reporting to name a few, to be antithetical to sound human factors engineering, which demands simplification and standardization to be most effective.

We have not found a time-motion study focused on this domain so there are no well-known MM/RM baselines to ground this process study. Bill and I have read several conference briefs, papers, reports and articles about medical management and its sub domains--utilization, case, disease, referral, consult, etc.

We are System Thinkers and wonder how the MHS executive leaders think about this management practice. Is the nirvana of medical management defined by the absence of job titles because of long-awaited application and data integration to implement iEHR (life after ALHTA), or something else?

We'll take any read heads to be informed viewers of the DCO event.

Regards,

**11:51 AM 07 Sep 2011**

CDR McArdie and CDR McGuire:

My colleague, Bill Steele, and I want to shadow your operations long enough to witness an entire episode of care coordination. We have not been able to find time-motion like data of Care Coordinators to ground our recommendations for change in 1) locally published, controlled and measured processes 2) trained practices of Care Coordination and 3) information management / information technology applications (licensed or home-built) to [quantitative] improve the domain of Referral Management.

MAJ Nelson, Winn Army Community Hospital, is the Contracting Officer Technical Representative. Mr. Dennis Ruane is the Contracting Officer Representative. They can provide legitimacy to our request and its relevance to your office.

Please let us know when any window of time, any day of the week before Wednesday 28 Sep 2011, Bill and/or I can interact with you under any constraints or limitations set by WRNMMCB et al.

Bill and I have specific goals for working with you. First, we want to enumerate the terms, phrases and concepts used with those you interact that are cause for rework, mistakes and/or confusion. Second, we want to measure the cycle times for repetitive tasks while using IM/IT systems to coordinate care. Third, we want your precise input on which changes to your microcosm's structural and behavioral elements that need to occur in priority order to achieve the level of efficiencies you know or think is possible and sustainable.

Attached is our [working] view of the REFERRAL in terms of its states and transition conditions spanning its life cycle from an absolute sense, meaning the union of views of all stakeholders (i.e., payers, providers, patients). The performance work statement is background information for the MM Process Analysis Study.

Regards,

02:40 PM **07 Sep 2011**

COL DeLorimier,

I spoke with the U.S. Army OTSG's Business Operations Chief, Dave Griffin a few minutes ago. His request to digest the vast flow of words and wants I spoke forced me to write him via AKO.

I finally wrote the quantitative parameters based on the MM Process Analysis study Performance Work Statement.

I'm hoping we can share the same mindset by exchanging facts and figures on what the flowery words imply when we read

"fully integrated"

"optimized execution"

"automatically generated"

"instant notification"  
"highest quality ..."  
"enterprise wide..."  
"standardized implementation..."

I think we have a similar mentality about the "concept of efficiency" when it comes to MM and its sub disciplines but we will not know under we get into the details tomorrow. Bill and I are searching for the realistic asymptotes of performance for IM/IT and personnel for a given policy/process/procedure stack. We believe you have defined those asymptotes and that stack.

Regards,

10:40 PM 13 Sep 2011

COL de Lorimier,

I'm digging into the numbers and have questions.

page 3: 540,000 referrals in JOA during CY2010

page 3: 810,000 calls JUST at WRAMC, NNMC and FBCH during CY2010

page 10: 300,000 referrals/year IRMAC capacity

page 10: 810,000 calls/year IRMAC capacity

page 34: Ratio Appointments to Calls - 50% of call result in an appointment

When I consider 50% of the IRMAC call capacity should result in an appointment,  $810,000 * 0.5 = 405,000$  appointments and ASSUME 1 referral is associated with 1 appointment then the 300,000 referrals/year goals is OFF by 105,000 referrals/year. Unless, the data reveal 1 referral to 1.35 appointment ratio (405K/300K), how do you explain having too few referrals per year as a goal?

Can you tell me how are your able to cite the referral/year for the JOA but not for the fraction of MTFs with RMCs (see..., the majority of which were directed to DeWitt, NNMC or WRAMC specialty services)? Does that referral majority equal 300,000 referrals/year and the remaining 240,000 referrals/year were directed to the MTFs not managed by one of the seven RMCs in the JOA? Why not have a table that makes the bookkeeping transparent, even if it goes in an appendix or annex as a baseline?

What is the interval you want to calculate the abandonment percentage and averages (see page 34)? It's not specified or implied.

Work day, business day, duty day, and just day are used. You might want to eliminate the variations unless there are separate calendars for each type. I expect to read "calendar day" to be clear about each and every day elapsed for ATC standards as opposed to the unmodified day. Consider a glossary if you insist on using all 4 modifiers of the time unit, day.

Speaking of "all", I noticed you used that term in 5 of 14 goals enumerated (see page 34). Did you purposely leave out "all" in #s 3., 4. and 5.? What is the reader to assume when all is absent from the goal statement?

I'll email more as they pop up during my analysis and translation of your content into UML 2.3 diagrams.

Regards,

**11:45 PM 13 Sep 2011**

COL deLorimier,

More questions.

What is the name of the document that has the data and information to use criterion 3 on page 14? What exactly do you collect on providers to know they have the expertise for a referral when the patient illness could be a mystery? Along those same lines, do you have access to what "right" equipment exists and is available (not in the shop for repair) for every MTF?

What is the result of an administrative review of referrals (see page 14); some kind of report using a standard DD Form? Are reviews and artifacts generated now in the JOA? We'd love to get a copy of some administrative review reports, memos, etc.

Can you explain the differences between Manage...referrals and Process...referrals used in Section F, pages 15-16? Tell me what artifacts remain after someone manages a ...referral vice process it.

Regards,

**12:07 AM 16 Sep 2011**

Terry,

We didn't get answers from COL DeLorimier's team yet.

Did you read the ONC's Federal Health IT Strategic Plan 2011- 2015 (80 pp) yet? How does it compare to the MHS Strategic Plan and Action Plans? Does the AMEDD have a Health IT Strategic Plan too? Part of me hopes it does NOT because that just represents another faction in the MHS enterprise that has to be harmonized as opposed to leverage what the MHS wants for all its providers and beneficiaries.

If you can give us any AMEDD measurement framework documents that essential represent WHAT it takes to truly Manage Care, we appreciate it. I'm curious to know just how fast the leaders what to know how good and bad processes are executing, how fast patient outcomes are

changing, etc. from their web interface to the enterprise NOT via a response to a task for the Healthcare Studies & Analysis Unit.

Please call me anytime tomorrow, Friday, 16 Sep 2011 if you have 30 minutes for one last conversation. Bill and I are going dark next week, starting Tuesday, to write the Study Report with what we have from others. Chasing people to probe them for process (not outputs or outcomes) measures and metrics is terribly time consuming and has not yielded any data thus far. We have referral throughput data but not process efficiency data which is what we are suppose to analyze.

I dropped in at Joint Base Andrews this afternoon (3:30 - 4:00 EST) and spoke with Ms. Patricia Ashe for 30 minutes, Chief Referral Management. She was a great listener but offered no or presented no documents on how their processes have changed or are performing since the Air Force congealed into their RMC structure in 2004. Unfortunately, Malcolm Grow Hospital will be a Super Clinic as of FY12 and there is a AAA inspection all next week her group is part of, which is a polite way of saying we cannot host you for any period of time to shadow operations next week.

Regards,

**09:33 PM 19 Sep 2011**

Terry.

How involved is to answer the following?

How many AMEDD beneficiaries (# of # of total beneficiaries in the AMEDD population) as of any given date-time group in CY2010 never had a referral or consult as a MHS beneficiary as of that date-time group?

Regards,

**9:55 PM 19 Sep 2011**

Terry,

I am wondering if the referral and/or consult is like death and taxes for AMEDD's beneficiaries--guaranteed you will experience it. Knowing so allows me to write in a way that implies the effects of any future referral management change will be felt or affect everyone in the USA. It also indicates the span of inertia in the "system".

Two follow-on trivial questions are

What is the longest time before a new AMEDD beneficiary had his/her first referral?  
The shortest time?

Regards,

04:59 PM **20 Sep 2011**

Kathy,

Thanks for taking my 22-min call this afternoon. I'll attempt to contact the CORs for their permission to have the MCSC answer a few basic IT infrastructure and application questions.

TRIWEST - West Region - Marty "Charles" Blomberg  
Humana - South Region - Ken Reid  
HealthNet - North Region - Steve Hellman

On page 11 of your brief

– 96% of referrals for Prime enrollees shall be to an MTF or civilian network provider.

When I read a constraint (or objective albeit abbreviated for the brief) like this and think of the policy analysis behind it, I wonder (and I'm asking) 1) what is the cost distribution of referrals? In other words does 96% of referrals equals 96% of cost [\$] to an MTF or civilian network provider and conversely 4% of cost to out-of-network providers? 2) What calendar period to you use to calculate the percentage? A varying contract award fee period, CY, GFY, other?

Regards,

11:23 PM **20 Sep 2011**

IRMAC Team:

Your CONOPS uses the word referral 178 times and it is modified 21 different ways. The USAF RMC Users Guide modifies the word 74 different ways! Considering the many attributes a referral has given its stage of life or processing, have you considered reducing or simplifying the number of modifiers (adjectives) to strictly control with the IM/IT language used in the displays with that used in your CONOPS? It would help when diagramming the referral management domain. If not, when you write explanations in your glossary consider addressing the 21 variants of referral.

Regards,

12:07 PM **21 Sep 2011**

Hi Barb,

7,000 Epic customers on site this week sounds like a lot of folks to cater to! Any answers will be appreciated, even if it's next week. Please do not hesitate to send partial answers as they emerge. I'm looking for what's "off the shelf (but has to be configured, NOT specified, designed, programmed, tested, ..." first and what's possible second.

I mentioned I'm wrapping up a study for the US Army Office of the Surgeon General on streamlining referral management by analyzing its processes and identifying best practices of RM in the military health system and industry.

My questions.

1. what software features do you have that render or display a manager's goal in near real-time (e.g., care execution as it's quantitatively defined from elements of a master data model) when the execution occurs in many rooms on many floors across many buildings on different installations in a geographical region (i.e., end users' data entry on end systems of a metropolitan area network)?
2. What software features and functions do you have for referring providers and referral managers to query or be notified of patient encounters or no shows in near real time with in-network and/or out-of-network providers at their treatment facilities?
3. What software features and functions do you have to eliminate or significantly reduce the effort and wall clock time it takes referred providers to send the clear and legible report per patient encounter to the referring provider and/or referral management office or referral management center (RMO | RMC)?
4. What design pattern(s) do you have and have used for transforming faxes from referred providers into notifications to referring providers and RMO or RMC in near real-time?
5. How do you index and render or display CLR's so referring providers can quickly query report data and / or metadata for treatment planning?
6. What software features and functions do you have to effectuate disease management and utilization management for user-defined sub-populations using EHR, which is composed of CLR's?

Regards,

09:29 AM **23 Sep 2011**

Rick,

Can you share any NCT financial structure and data? We'll be happy with only the parameters (minus actual and budgeted numbers) for life cycle costs of NCT. We have to answer a couple of questions about ROM costs for our recommendations and it makes sense for us to know a little something about NCT presentation of costs (budget, actual, variance as a function of time, function/feature point, requirement, release candidate, version, and/or Use Case). I realize this request is something you should be able to answer with extant files so I'm hoping there is little to no effort evolved after deciding on disclosure. At worst, you have to delete all the numbers

leaving behind just the names of the data element, which is VALUABLE to us. We'll take the lowest level (highest resolution) structure and data you can disclose.

Regards,

# Appendix C UML 2 Diagrams

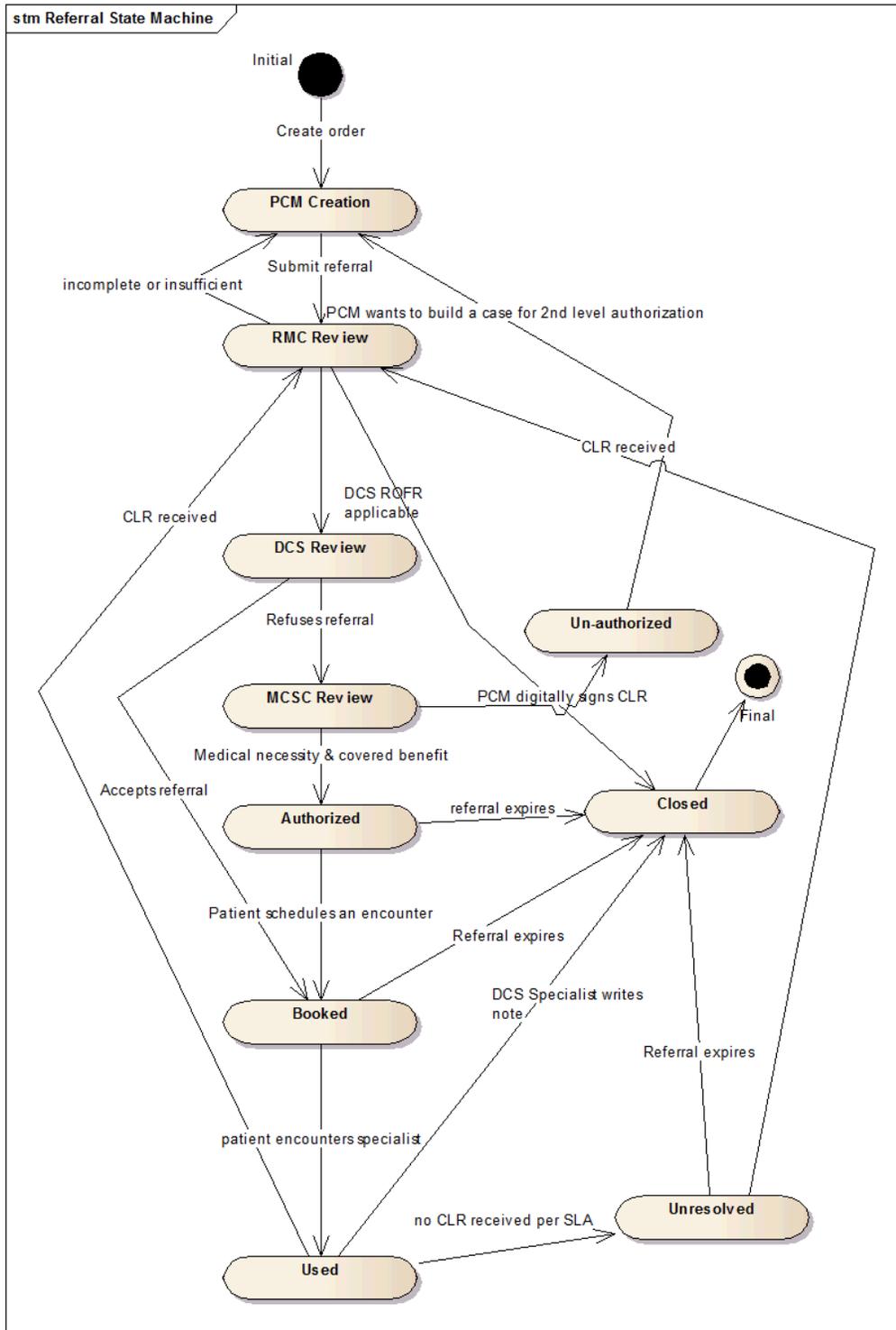


Figure 1: Referral State Machine Diagram

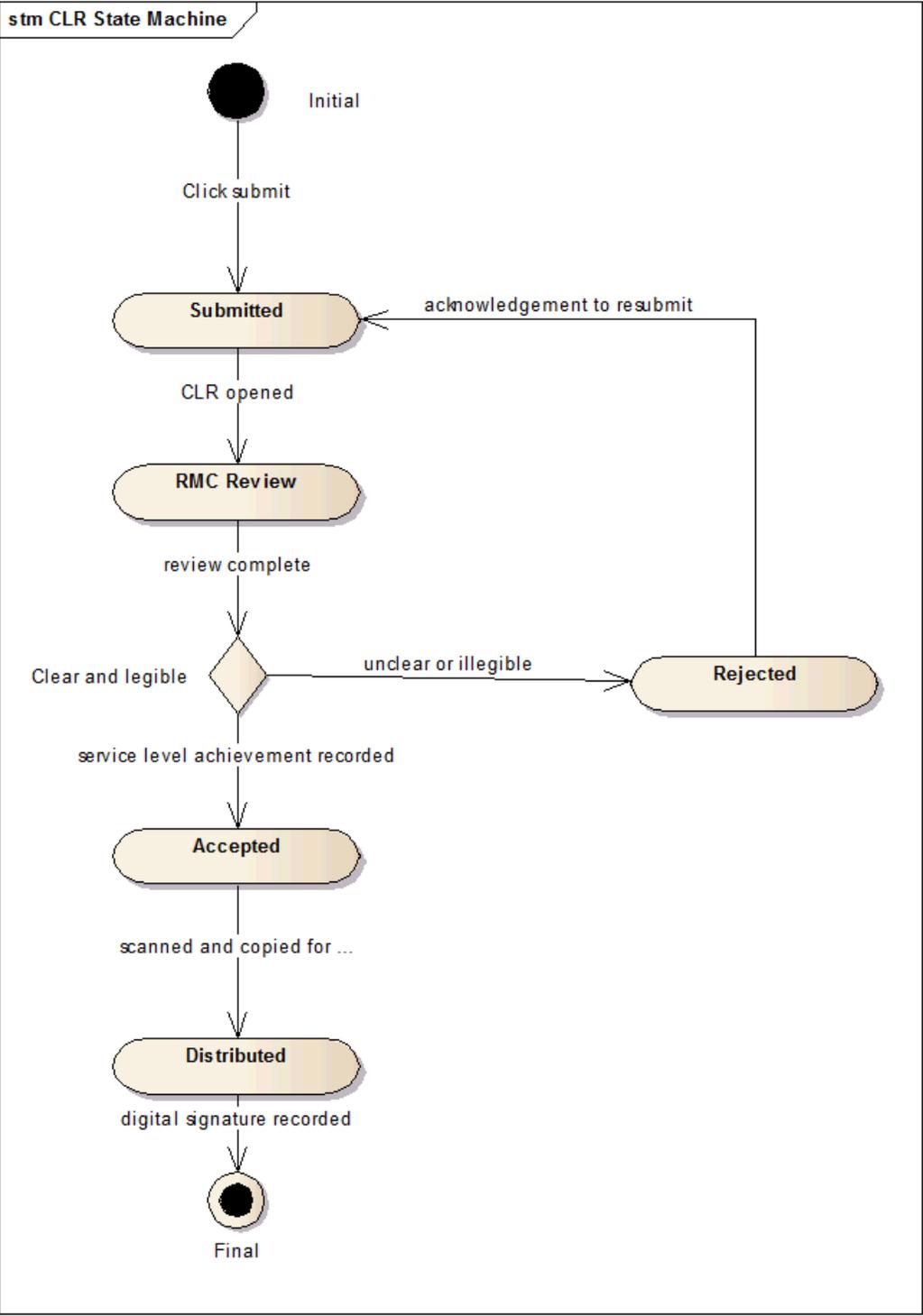


Figure 2: CLR State Machine Diagram

uc Manage Referrals Use Case Model

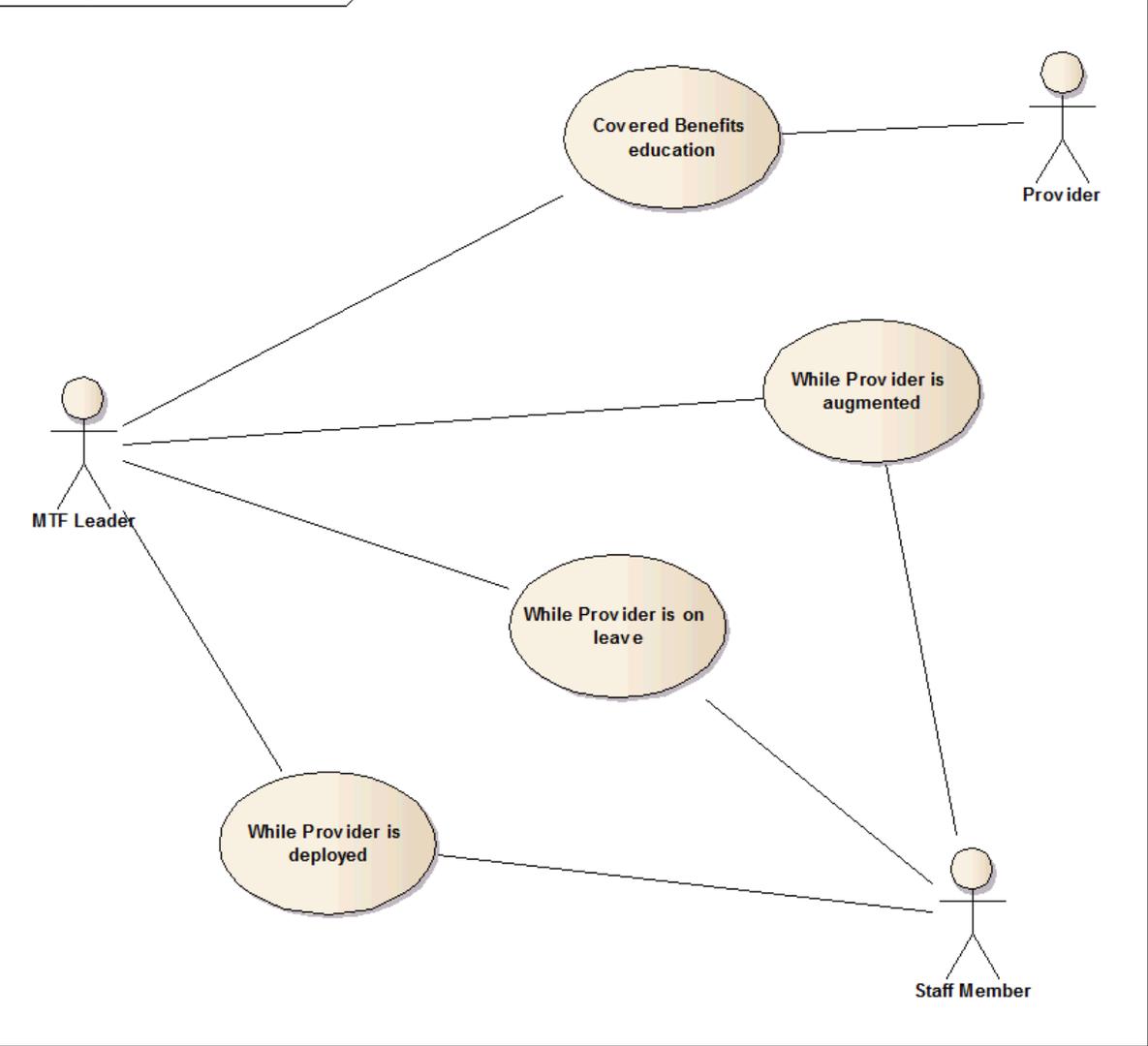


Figure 3: RMC UG Use Case

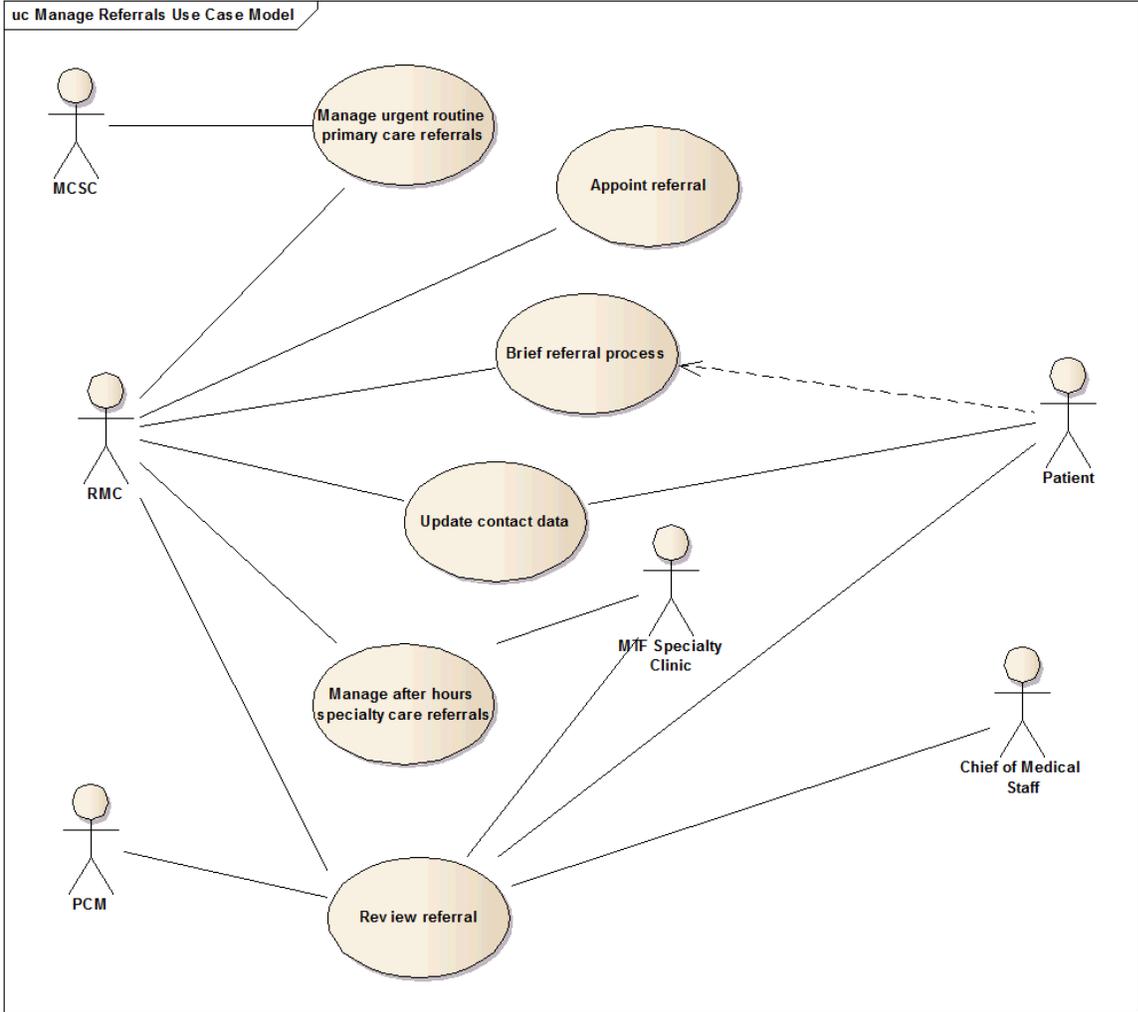


Figure 4: Manage Referrals Use Case 1

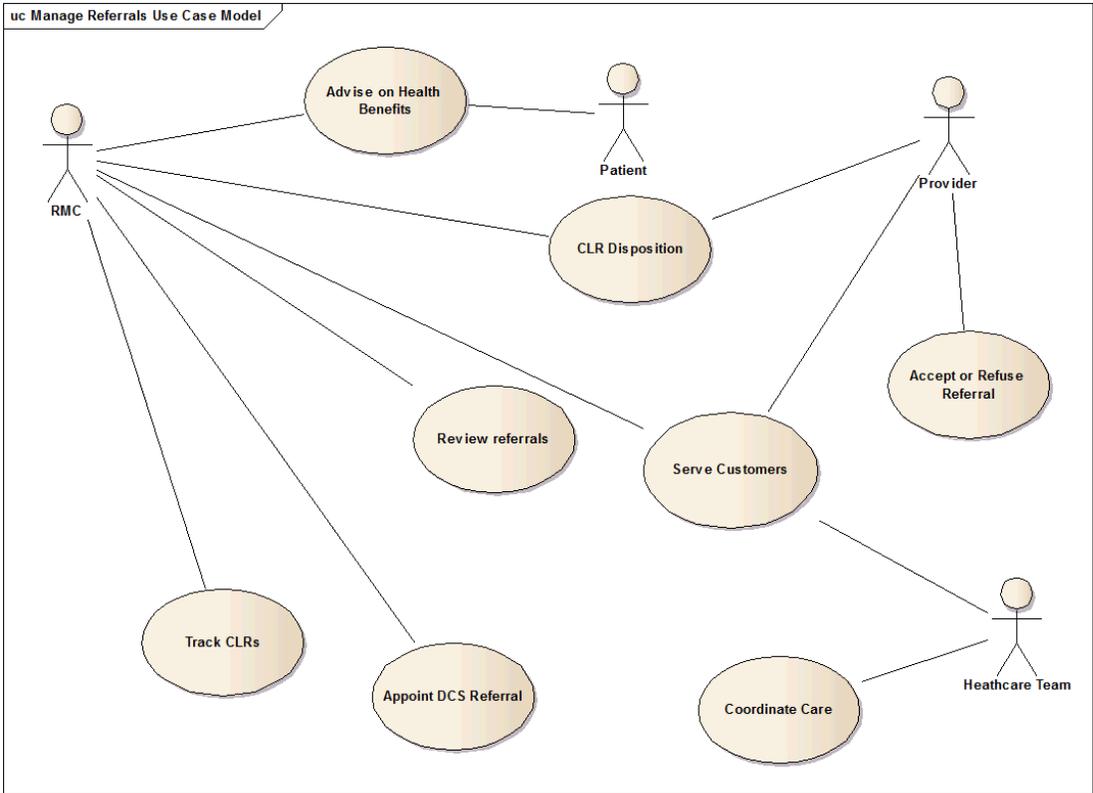


Figure 5: Manage Referrals Use Case 2

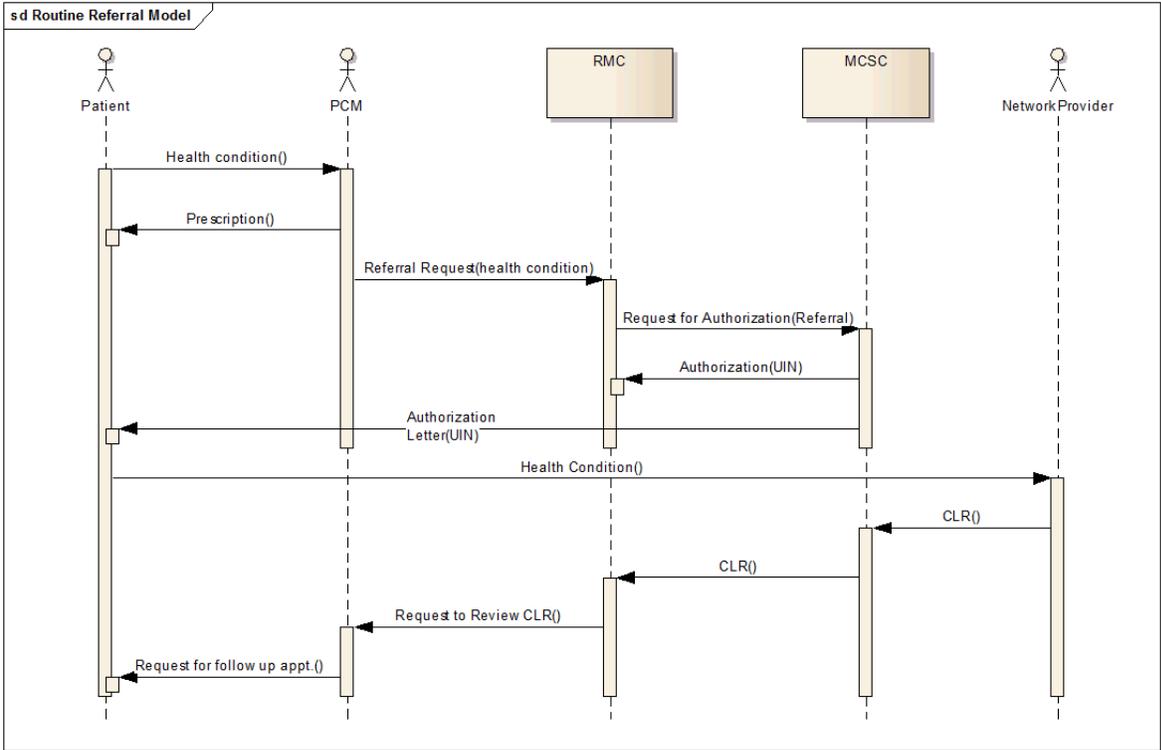


Figure 6: Routine Referral Sequence Diagram

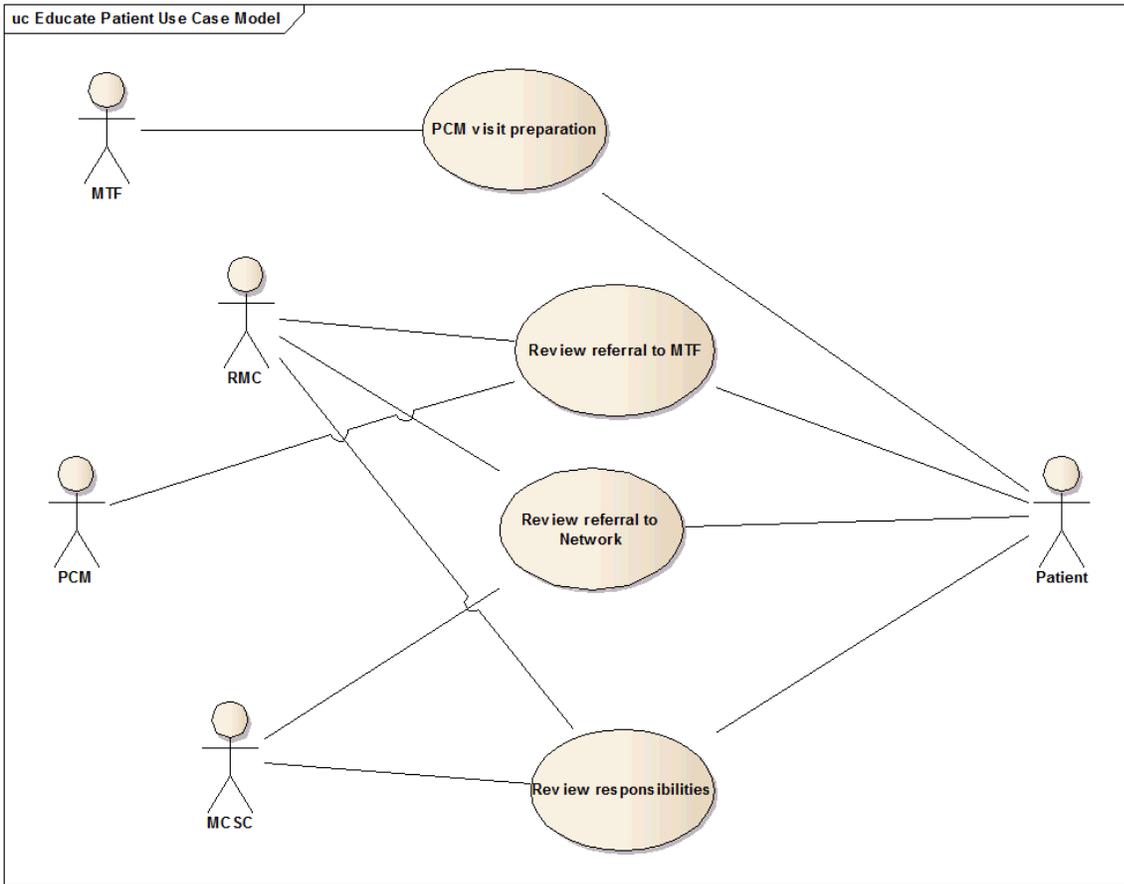


Figure 7: Patient Education Use Case

this is a "to be" DRAFT where the military EHR way ahead is intelligent and "talks" to comparable automated systems in the MTF's RMO/RCC/RMC and the MCSC's systems.

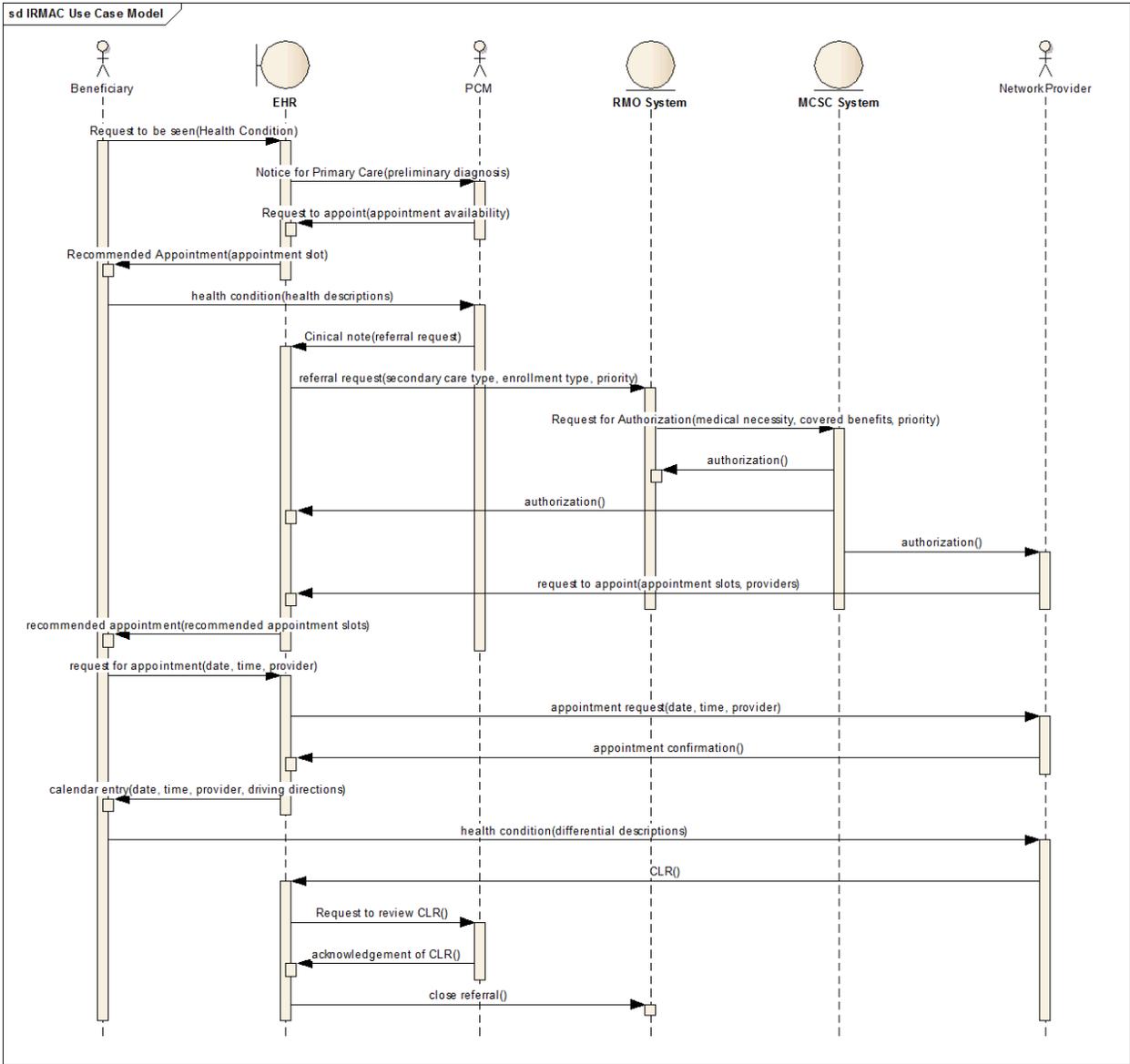


Figure 8: IRMAC Sequence Diagram

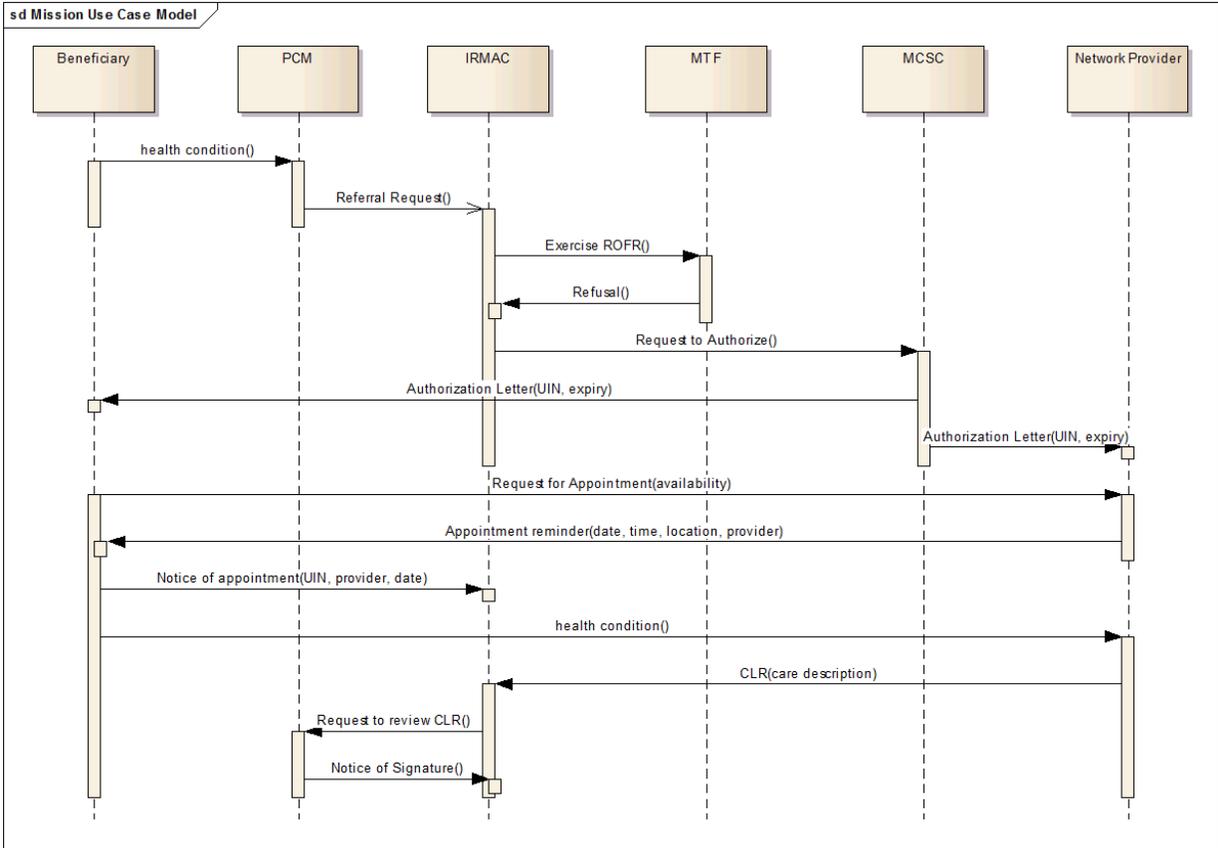


Figure 9: Mission Sequence Diagram

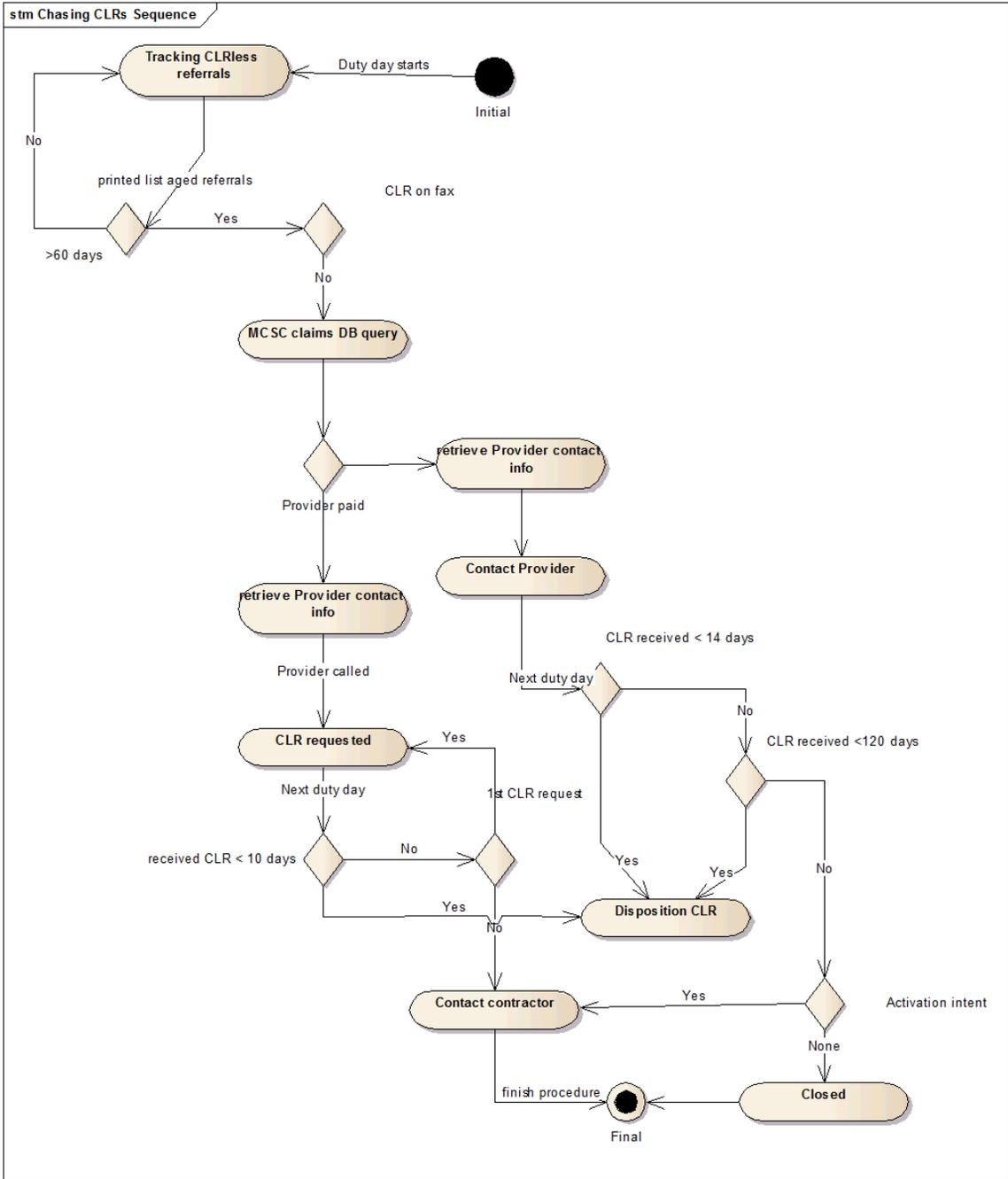


Figure 10: Chasing CLR State Model