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Assessing Medical Readiness Within Inpatient Platforms (Presentation)

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About this Publication
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IDA

Assessing Medical Readiness Within Inpatient Platforms

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IDA | Background

- An FY 2017–21 Resource Management Decision directed the Under Secretary of Defense for Personnel and Readiness and the Office of the Director, Cost Assessments and Program Evaluation (OD(CAPE)) to:
  - Assess the extent to which each inpatient platform provides the necessary workload volume and diversity of care to sustain readiness-required currency
  - Describe supplementary actions the Services can take to maintain provider currency
- OD(CAPE) asked the Institute for Defense Analyses (IDA) to perform the assessment
  - Results reported in IDA Paper P-8464

IDA | Study Objectives

- Develop methods to evaluate direct care inpatient data to identify the extent to which Military Treatment Facility (MTF) workload volume and diversity of care are sufficient to sustain clinical Knowledge, Skills, and Abilities (KSAs) for surgically related in-theater procedures
  - KSAs are used in civil service job descriptions
  - Office of the Assistant Secretary of Defense for Health Affairs has adopted a KSA-like approach to assess the readiness of deployed surgeons against required capabilities
- Identify and evaluate potential solutions to reduce or eliminate any identified gaps between the workload necessary to sustain KSAs and the actual current MTF workload

IDA | Working Within KSA Framework

- Problems with KSAs
  - Their development is still very preliminary
  - Few associated procedures (so far) to demonstrate provider proficiency
  - Plan is to map current MTF workload into KSA domains
- Study considered Essential Medical Capabilities (EMCs) instead*
  - Military Compensation and Retirement Modernization Commission (MCRMC) broadly defined EMCs as medical capabilities that are vital to effective and timely healthcare during contingency operations
  - IDA study for the MCRMC derived EMCs from analysis of Theater Medical Data Store and DoD Trauma Registry data
    - Focused on combat casualty care, particularly trauma
  - EMC approach focuses on what workload providers "should be" performing to maintain readiness-related skills

*EMCs are ICD-9-CM procedure codes

IDA | Top 10 EMCs by Volume (Iraq, 2007)

Procedure	Category	Frequency
Other diagnostic procedures on brain and cerebral meninges	Major Diagnostic	115
Other craniectomy	Major Therapeutic	88
Excisional debridement of wound, infection, or burn	Major Therapeutic	77
Elevation of skull fracture fragments	Major Therapeutic	76
Exploratory laparotomy	Major Therapeutic	75
Fasciotomy	Major Therapeutic	63
Delayed closure of granulating abdominal wound	Major Therapeutic	49
Suture of laceration of diaphragm	Major Therapeutic	47
Closure of laceration of liver	Major Therapeutic	47
Exploratory thoracotomy	Major Therapeutic	44
Other repair of cerebral meninges	Major Therapeutic	44

Source: DoD Trauma Registry

IDA | Evaluating Whether In-Garrison Workload Can Sustain Readiness of Medical Force

- Used Standard Inpatient Data Records (SIDRs) from the Military Health System Data Repository (MDR) to measure how often EMC procedures are performed by each provider at each MTF
  - MDR records up to 4 providers for up to 20 procedures
  - Used Healthcare Provider Taxonomy codes to determine provider specialty/subspecialty
    - Matched against list of surgical specialties
- To assess "readiness-related" workload gaps, must determine volume thresholds for proficiency maintenance for each specialty

IDA | Determining a Volume Threshold

- Some literature is available on workload levels needed to maintain individual provider proficiency
  - CNA report for MCRMC provides a nice overview
  - But nothing for EMC procedures
- Other approaches considered
  - Data from National Trauma Data Bank (NTDB)
    - Detailed data on diagnoses and procedures but no provider information
  - Hospital privileging standards
    - There don't appear to be any universally applied standards
      - Core procedure lists vary widely from hospital to hospital and are not very specific. In particular, no lists of procedures could be considered "readiness-related"
  - Clinicians are very wary of proficiency volume standards
    - But they are gaining grudging acceptance
- Fallback approach
  - Analyze inpatient workload data from San Antonio Military Medical Center (SAMMC), DoD's only Level 1 trauma center
    - Use median or other volume statistic for EMCs
      - Not technically a standard as much as a desirable goal

IDA | What Makes SAMMC a Good "Benchmark?"

- Obtained civilian EMC workload data from NTDB
  - Stratified random sample of Level 1 and Level 2 Trauma Centers
- Computed median frequency for each EMC
  - Based only on trauma centers with positive workload for that EMC
- Compared EMC workload for each MTF with NTDB median
  - L1 Count = number of EMCs where the MTF frequency was greater than or equal to the NTDB median for Level 1 Trauma Centers
  - L2 Count = number of EMCs where the MTF frequency was greater than or equal to the NTDB median for Level 2 Trauma Centers
  - SAMMC performs well in terms of EMC workload volume

Facility Name	Designation	L1 Count	L2 Count	L1 Percent	L2 Percent
SAN ANTONIO MMC-FT. SAM HOUSTN	1	87	92	90.6%	95.8%
WALTER REED NATL MIL MED CNTR	2	45	59	46.9%	61.5%
MADIGAN AMC-FT. LEWIS	2	38	54	39.6%	56.3%
NMC SAN DIEGO		34	50	35.4%	52.1%
TRIPLER AMC-FT SHAFTER		32	47	33.3%	49.0%
NMC PORTSMOUTH		32	44	33.3%	45.8%
WILLIAM BEAUMONT AMC-FT. BLISS	3	23	34	24.0%	35.4%
EISENHOWER AMC-FT. GORDON		23	30	24.0%	31.3%
WOMACK AMC-FT. BRAGG		22	30	22.9%	31.3%
81st MED GRP-KEESLER		18	24	18.8%	25.0%
60th MED GRP-TRAVIS		17	30	17.7%	31.3%
88th MED GRP-WRIGHT-PATTERSON		13	20	13.5%	20.8%
96th MED GRP-EGLIN		10	20	10.4%	20.8%
MARTIN ACH-FT. BENNING		10	13	10.4%	13.5%
EVANS ACH-FT. CARSON		9	18	9.4%	18.8%
DARNALL AMC-FT. HOOD	3	8	18	8.3%	18.8%
FT BELVOIR COMMUNITY HOSP-FBCH		8	16	8.3%	16.7%
99th MED GRP-O'CALLAGHAN HOSP		7	19	7.3%	19.8%
633rd MED GRP LANGLEY-EUSTIS		7	13	7.3%	13.5%
NH CAMP LEJEUNE		6	17	6.3%	17.7%
BLANCHFIELD ACH-FT. CAMPBELL		6	12	6.3%	12.5%
NH CAMP PENDLETON		6	12	6.3%	12.5%
673rd MED GRP-ELMENDORF		6	12	6.3%	12.5%
NH JACKSONVILLE		4	10	4.2%	10.4%
NH BREMERTON		4	7	4.2%	7.3%
BASSETT ACH-FT. WAINWRIGHT		4	4	4.2%	4.2%
L. WOOD ACH-FT. LEONARD WOOD		3	6	3.1%	6.3%
KELLER ACH-WEST POINT		3	4	3.1%	4.2%
IRWIN ACH-FT. RILEY		2	6	2.1%	6.3%
NH PENSACOLA		2	4	2.1%	4.2%
NH BEAUFORT		2	4	2.1%	4.2%
WINN ACH-FT. STEWART		1	4	1.0%	4.2%
MONCRIEF ACH-FT. JACKSON		1	4	1.0%	4.2%
BAYNE-JONES ACH-FT. POLK		1	3	1.0%	3.1%
IRELAND ACH-FT. KNOX		1	3	1.0%	3.1%
WEED ACH-FT. IRWIN		1	3	1.0%	3.1%
NH TWENTYNINE PALMS		1	2	1.0%	2.1%
NH OAK HARBOR		1	2	1.0%	2.1%
REYNOLDS ACH-FT. SILL		1	2	1.0%	2.1%
366th MED GRP-MOUNTAIN HOME		1	2	1.0%	2.1%

IDA | Computing SAMMC EMC Summary Statistics

- It is a simple matter to compute EMC workload summary statistics for each provider specialty
  - But statistics may be biased downward by inclusion of providers who do not routinely treat trauma cases
  - Nothing in the SIDR data explicitly identifies providers assigned to the trauma ward or Emergency Room
  - Using primary diagnosis codes, we were able to determine for each provider the percentage of their total hospital cases that were trauma-related
    - Used NTDB inclusion and exclusion criteria to determine trauma cases
  - Filtered out providers who saw few trauma cases
- Computed EMC summary statistics on remaining providers
  - Median
  - 75th percentile
  - Maximum

SAMMC EMC Summary Statistics by Specialty

Provider Specialty	Provider Subspecialty	Median	75th Percentile	Maximum	Provider Count
Anesthesiology	Anesthesiology	110	112	112	3
Anesthesiology	Critical Care Medicine	16	28	28	2
Neurological Surgery	Neurological Surgery	28	51	51	4
Orthopaedic Surgery	Orthopaedic Surgery	67	100	103	4
Orthopaedic Surgery	Hand Surgery	10	17	17	2
Orthopaedic Surgery	Orthopaedic Trauma	36	36	36	1
General Surgery	General Surgery	104	131	131	7
General Surgery	Surgical Critical Care	58	80	80	3
General Surgery	Trauma Surgery	67	67	112	4

MHS-Wide EMC Workload Gaps (Dispositions) by Provider Specialty

Provider Specialty	Provider Subspecialty	Workload Gap	Avg. Gap per FTE Provider	Provider FTEs	Supported Providers*
Anesthesiology	Anesthesiology	-13,372	-127.7	104.8	6.4
Anesthesiology	Critical Care Medicine	-82	-11.4	7.2	3.9
Neurological Surgery	Neurological Surgery	-539	-15.9	30.2	14.8
Orthopaedic Surgery	Orthopaedic Surgery	-13,352	-58.8	192.7	26.2
Orthopaedic Surgery	Hand Surgery	-112	-6.2	14.2	6.8
Orthopaedic Surgery	Orthopaedic Trauma	-72	-18.0	3.1	2.0
General Surgery	General Surgery	-33,788	-96.5	278.9	24.0
General Surgery	Surgical Critical Care	-596	-42.6	11.7	3.6
General Surgery	Trauma Surgery	-201	-28.7	6.7	4.0
Total	**Total**	**-62,114**	**-95.6**	**649.5**	**91.7**

*** Supported Providers = Total Workload Performed ÷ SAMMC Benchmark (by Specialty)**

- There is currently enough EMC workload to support only 14 percent of surgical providers who would normally be expected to perform those procedures

IDA | Relaxing the EMC Workload Requirement

- May not be enough severe trauma cases of the types encountered in theater (largely involving multiple penetrating injuries) for providers to maintain currency
- Evaluated MTF workload against a more general standard
  - Broadened procedure list to include all major trauma cases, not just the procedures that providers actually perform in theater
  - Used NTDB definition of major trauma
- Derived workload benchmarks and supported providers for major trauma procedures analogous to those for EMCs
- There is currently enough major trauma workload to support only 28 percent of surgical providers who would normally be expected to perform those procedures

IDA | Conclusions

- EMC and major trauma workload gaps are substantial and need to be addressed
- But there are means for expanding provider access to readiness-related workload
  - Presented at earlier session (#131) by colleague Sarah Burns

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14. ABSTRACT

The readiness of the military medical force to provide care in an operational environment has been a subject of particular concern to the Congress, as reflected in the National Defense Authorization Act for Fiscal Year 2017. Studies have suggested there may be an insufficient volume and diversity of inpatient care at military treatment facilities (MTFs) to sustain the readiness-related clinical skills needed by providers when deployed to a conflict zone. This briefing presents the results of our attempt to measure the extent to which MTF inpatient workload volume and diversity of care are sufficient to sustain the readiness-related skills of military surgeons.

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