

Identification of Fecal Occult Blood Test (FOBT) Follow-Ups: Population Based Methods & Preliminary Findings

12 JUL 2018

BLUF

- We found no evidence of colonoscopy at any time after the positive FOBT in 62% of adult patients with positive FOBT from Navy MTFs (Table 1). A majority were from James A Lovell FHCC, followed by NMC San Diego and NMC Portsmouth (Figure 1 and Table 2).
- No trend in follow-up was observed with age overall. At Parent MTF level, age trends were observed (Table 1, Table 3, and Table 4).
- There are aspects of the care pathway that this population level analytic approach can't assess. This further emphasizes the need for a patient level case review of those with no evidence of colonoscopies following a positive test (See sections titled "Patient Rosters and Case Reviews", "Limitations", and "Preliminary Findings").

Background

The Navy and Marine Corps Public Health Center (NMCPHC) Commander was contacted by the Navy Medicine Bureau of Medicine and Surgery (BUMED) to provide health analytic support to assess a potential gap in care across Navy Medicine. The NMCPHC Health Analysis Department (HA) developed methods for a population-level solution to identify patients who may have been lost to follow-up after a positive fecal occult blood test (FOBT). We developed these methods in collaboration with the Director of Patient Safety at NAVMED West and the Head of Gastrointestinal Endoscopy at NMC San Diego. These methods ensure a standardized case definition is used Navy Medicine-wide to identify opportunities for targeted case reviews by MTFs and enable leadership to determine if, and to what extent, the patient safety issue exists.

These methods outline our approach to answering the following questions:

1. Who had a positive FOBT at a Navy Military Treatment Facility (MTF) that has no evidence of further follow-up screening at any time after the positive test?
2. What MTF did the FOBT?
3. How does follow-up compare in adults 50 years and older to those less than 50 years old, and across MTFs?



Identification of Positive FOBTs

Using the Military Health System Data Repository (MDR), we identified FOBTs performed in MTFs from fiscal year (FY) 2013 to 2017 using administrative procedure codes and Logical Observation Identifiers Names and Codes (LOINCs). LOINCs are a universal standard for identifying the laboratory observation result. MDR is a data warehouse containing the most complete collection of data about healthcare provided to beneficiaries of the MHS.

FOBT procedure codes entered into the Composite Healthcare System (CHCS) and Armed Forces Health Longitudinal Technology Application (AHLTA) and ancillary orders from originating from CHCS were identified using the Ancillary table in MDR:

- CPT: 82270, 82274, 81528
- HCPCS: G0464, G0328, G0394

Lab results from AHLTA were identified using the Chemistry table of MDR. We used two different search terms ("FECAL" or "OCCULT") on lab test name, lab result name, LOINC name and specimen type to identify potentially related LOINCs: 58453-2, 2335-8, 29771-3, 14563-1, 14564-9, 14565-6.

We identified positive FOBTs using the field in the MDR Chemistry table which contains the text value for a chemistry lab result. We considered the following results positive tests after consultation with HA clinicians:

- 'ACUTE-POSITIVE(QC ACC)'
- 'CRS POSITIVE (QC ACC)'
- 'POS'
- 'POS (IFOBT)'
- 'POSITIVE'
- 'POSITIVE (INTERNAL QC ACCEPTAB'
- 'POSITIVE FOR OCCULT BLOOD'
- 'POSITIVE QC ACCEPTABLE'
- 'POSITIVE SCREEN FOR UPPER/LOWE'
- 'POSITIVE SCREEN STRICTLY LOWER'
- 'POSITIVE X 1'
- 'POSITIVE X 2'
- 'POSITIVE X 3'
- 'POSITIVE(QC ACCEPTABLE)'
- 'POSITIVE, INT. QC ACCEPTABLE'
- 'POSITIVE, INTERNAL CONTROL ACC'
- 'POSITIVE, INTERNAL QC PASSED'
- 'POSITIVE, QC SATISFACTORY'
- 'POSITIVE, QUALITY CONTROL SATI'
- 'POSITIVE/INTERNAL QC ACCEPTABL'
- 'POSITIVE; QC ACCEPTABLE'



- 'POSITIVE;QC OKAY'

We assumed the result identified in the MDR Chemistry table via LOINC was associated with the order identified in the Ancillary table via procedure code if the records matched on specimen collection date and person identifier. We kept the first positive FOBT per person.

Identifying Follow-Up Care via Colonoscopies

To assess for evidence of proper follow-up of a positive test, we searched for colonoscopies occurring any time after the specimen collection date. We did not consider other modes of colorectal cancer screening as proper follow-up. We used procedure codes documented in inpatient and outpatient settings in either direct care from any military service or purchased care claims (MDR CAPER, SIDR, TED-I, TED-NI tables):

- CPT: 44388-44394, 44397, 44401-44408, 45355, 45378-45393, 45398
- HCPCS: G0105, G0121
- ICD-9 Procedures: 45.22, 45.23, 45.25, 45.42, 45.43
- ICD-10 Procedures: 0DJD8ZZ, 3E0H8GC, 0D9Q8ZX, 0D9E8ZX, 0D9L8ZX, 0D9N8ZX, 0D9P9ZX, 0D9F8ZX, 0D9G8ZX, 0D9B8ZX, 0D9C8ZX, 0D9M8ZX, 0D9H8ZX, 0D9K8ZX, 0D9K90Z, 0D9E80Z, 0D9L80Z, 0D9N80Z, 0D9P80Z, 0D9F80Z, 0D9G80Z, 0D9B80Z, 0D9C80Z, 0D9M80Z, 0D9H80Z, 0DDQ8ZK, 0DDE8ZK, 0DDL8ZK, 0DDN8ZK, 0DDP8ZK, 0DDF8ZK, 0DDG8ZK, 0DDB8ZK, 0DDC8ZK, 0DDM8ZK, 0DDH8ZK, 0DDK8ZK, 0DBQ8ZX, 0DBE8ZX, 0DBL8ZX, 0DBN8ZX, 0DBP8ZX, 0DBF8ZX, 0DBG8ZX, 0DBB8ZX, 0DBC8ZX, 0DBM8ZX, 0DBH8ZX, 0DBK8ZX, 0DBK8ZZ, 0DBE8ZZ, 0DBL8ZZ, 0DBN8ZZ, 0DBP8ZZ, 0DBF8ZZ, 0DBG8ZZ, 0DBB8ZZ, 0DBC8ZZ, 0DBM8ZZ, 0DBH8ZZ, 0DBQ8ZZ, 0W3P8ZZ, 0D5K8ZZ, 0D5E8ZZ, 0D5L8ZZ, 0D5N8ZZ, 0D5P8ZZ, 0D5F8ZZ, 0D5G8ZZ, 0D5B8ZZ, 0D5C8ZZ, 0D5M8ZZ, 0D5H8ZZ, 0DCK8ZZ, 0DCH8ZZ, 0DCM8ZZ, 0DCC8ZZ, 0DCB8ZZ, 0DCG8ZZ, 0DCF8ZZ, 0DCP8ZZ, 0DCN8ZZ, 0DCL8ZZ, 0DCE8ZZ, 0D7K8DZ, 0D7E8DZ, 0D7L8DZ, 0D7N8DZ, 0D7P8DZ, 0D7F8DZ, 0D7G8DZ, 0D7B8DZ, 0D7C8DZ, 0D7M8DZ, 0D7H8DZ, 0D7K8ZZ, 0D7E8ZZ, 0D7L8ZZ, 0D7N8ZZ, 0D7P8ZZ, 0D7F8ZZ, 0D7G8ZZ, 0D7B8ZZ, 0D7C8ZZ, 0D7M8ZZ, 0D7H8ZZ

We compared the first positive FOBT per person performed at a Navy MTF to the most recent colonoscopy procedure date available through FY18. This method captures any administrative procedure code documented in a MHS electronic health record or billed to TRICARE as of 10 JUL 2018. We stratified by MTF of positive FOBT, age (50+ and <50), and year of positive FOBT. We recommend that individuals without evidence of a colonoscopy procedure code undergo further case review to assess for potential gaps in follow-up care.

Patient Rosters and Case Reviews

We will provide a roster of all positive FOBTs that occurred at a Navy MTF from FY 2013-2017 that had no evidence of a colonoscopy afterward based on MDR completeness in July 2018. The roster will include EDIPN, age, result date, result (text), result comment, and MTF that ordered the FOBT.



There are aspects of the care pathway that this population level analytic approach can't assess. This further emphasizes the need for a patient level case review of those with no evidence of colonoscopies following a positive test. For example:

- The patient may have had a positive FOBT but notes indicate valid reasoning for no follow-up colonoscopy or patient refusal.
- The patient may have had follow-up screening after a positive FOBT but it was not a colonoscopy.
- The FOBT may have been unwarranted and it was already known there would be a positive result, so the care pathway was altered from our case definition.
- The positive FOBT or lack of colonoscopy documentation could be due to coding errors on the record.
- A colonoscopy was done but TRICARE wasn't billed. TRICARE is always a second payer and patients can also pay out of pocket. Similarly, care provided in theater, while deployed, or by the VA may not be available.
- The patient died or became ineligible for MHS benefits after the FOBT but before a colonoscopy.
- The MTF tried to contact the patient about positive results without success.
- The site where the colonoscopy was intended to happen transitioned to MHS Genesis and therefore evidence of follow-up was not available in population level databases for this analysis.

Limitations

- We cannot get lab results for tests done in purchased care. Only the minimum information necessary for billing TRICARE are available on claims.
- MTFs started transitioning to MHS GENESIS in July 2017. Data normally available in M2 and MDR are not available for NH Bremerton (September 2017+) and NH Oak Harbor (July 2017+) until further notice. Local MTFs would have to pull data after this time frame.
- Follow-up for more recent data could be underestimated. It is standard to assume 95% of the direct care encounters will be available in MDR three months after the encounter occurs; due to the billing nature of purchased care claims, 95% of the records are not likely available until six months after the care was received. Even though this is a limitation, we are able to use existing FY18 data to identify FOBT related care if this remains a patient safety concern.

Preliminary Findings

1. We found no evidence of colonoscopy at any time after the positive FOBT in 62% of adult patients with positive FOBT from Navy MTFs (Table 1).
2. A majority of those without evidence of colonoscopy were from James A Lovell FHCC, followed by NMC San Diego and NMC Portsmouth (Figure 1 and Table 2).
3. No trend in follow-up was observed with age overall; about 60% of adults 50 years and older had no evidence of colonoscopy after a positive FOBT, compared to 63% in those less than 50 years old (Table 1).
4. At Parent MTF level, age trends were observed. Those 50 years and older tended to have a follow-up colonoscopy more often than those under 50 years old (Tables 3 and 4).



We recommend that individuals without evidence of a colonoscopy procedure code undergo further case review to assess for potential gaps in follow-up care. While the “gold standard” follow-up with colonoscopy could not be identified for these patients, a similar analysis assessing whether another form of more in-depth colorectal cancer screening took place may save time in case reviews. The follow up criteria would be modified as follows:

COLORECTAL CANCER SCREENING			
Description	CPT	HCPCS	ICD-9-CM Procedure/ ICD-10-PCS
Colonoscopy	44388-44394, 44397, 44401-44408, 45355, 45378-45393, 45398	G0105, G0121	45.22, 45.23, 45.25, 45.42, 45.43
Flexible Sigmoidoscopy	45330-45335, 45337-45342, 45345-45347, 45349, 45350	G0104	45.24
CT Colonography	74263		

*Source: DHA Military Health System Population Health Portal (MHSPP) Colorectal Cancer Screening Technical Specification, 3 Apr 2017.

Contact Information

The Health Analysis Department's mission is to provide epidemiologic expertise and leadership to improve the value of Navy health care and operational force readiness through clinical health analysis, epidemiologic, and evidence-based methods. For questions about this analysis or to propose additional project ideas, please contact:

Health Analysis Department

Email: usn.hampton-roads.navmcpubhlthcenpors.list.nmcpohc-haproireq@mail.mil

Website: <http://www.med.navy.mil/sites/nmcpohc/health-analysis>

Table 1. Positive FOBTs and Colonoscopy Follow-Up by Age Group, FY13-17

Age Group	Colonoscopy Post-FOBT			No Follow-Up Evidence (%)
	No	Yes	Total	
18-49	3,009	1,766	4,775	63.0
50+	2,717	1,826	4,543	59.8
Total	5,726	3,592	9,318	61.5

Health Analysis Department, Navy and Marine Corps Public Health Center.

Source: Military Health System Data Repository (MDR), Chemistry table, Ancillary table, Comprehensive Ambulatory / Professional Encounter Record (CAPER), Standard Inpatient Data Record (SIDR), TRICARE Encounter Data - Non-Institutional (TED-NI), TRICARE Encounter Data - Institutional (TED-I), July 2018.

Abbreviations: FOBT = fecal occult blood test.



Table 2. Positive FOBTs and Colonoscopy Follow-Up by Parent MTF, 18+ Years, FY13-17

Region & Parent MTF of FOBT	Colonoscopy Post-FOBT			No Follow-Up Evidence (%)
	No	Yes	Total	
East	3,826	1,855	5,681	67.3
James A Lovell FHCC	1,485	70	1,555	95.5
NMC Portsmouth	622	399	1,021	60.9
NH Jacksonville	464	430	894	51.9
NMC Camp Lejeune	333	191	524	63.5
NH Pensacola	313	247	560	55.9
NHC New England	130	215	345	37.7
NH Beaufort	126	56	182	69.2
NH Sigonella	65	25	90	72.2
NH Naples	60	26	86	69.8
NH Rota	52	23	75	69.3
NHC Charleston	46	68	114	40.4
NHC Annapolis	35	25	60	58.3
NHC Corpus Christi	32	20	52	61.5
NH Guantanamo Bay	21	3	24	87.5
NHC Quantico	15	29	44	34.1
NHC Patuxent River	14	16	30	46.7
NHC Cherry Point	13	12	25	52.0
West	1,885	1,728	3,613	52.2
NMC San Diego	678	816	1,494	45.4
NH Guam-Agana	369	190	559	66.0
NH Bremerton	250	292	542	46.1
NH Okinawa	189	71	260	72.7
NH Yokosuka	130	50	180	72.2
NHC Oak Harbor Birthing Center	114	168	282	40.4
NHC Hawaii	53	54	107	49.5
NH Twentynine Palms	37	31	68	54.4
NH Camp Pendleton	34	28	62	54.8
NHC Lemoore	31	28	59	52.5

Health Analysis Department, Navy and Marine Corps Public Health Center.

Source: Military Health System Data Repository (MDR), Chemistry table, Ancillary table, Comprehensive Ambulatory / Professional Encounter Record (CAPER), Standard Inpatient Data Record (SIDR), TRICARE Encounter Data - Non-Institutional (TED-NI), TRICARE Encounter Data - Institutional (TED-I), July 2018.

Abbreviations: FHCC = Federal Health Care Center; Ia = Inactive; NH = Naval Hospital; NHC = Naval Health Center, NMC = Naval Medical Center; Op = Operational.



Table 3. Positive FOBTs and Colonoscopy Follow-Up by Parent MTF, 50+ Years, FY13-17

Region & Parent MTF of FOBT	Colonoscopy Post-FOBT			No Follow-Up Evidence (%)
	No	Yes	Total	
East	1,732	724	2,456	70.5
James A Lovell FHCC	1,053	25	1,078	97.7
NMC Portsmouth	207	152	359	57.7
NH Jacksonville	174	198	372	46.8
NMC Camp Lejeune	68	60	128	53.1
NH Pensacola	102	85	187	54.5
NHC New England	66	118	184	35.9
NH Beaufort	7	11	18	38.9
NH Sigonella	4	7	11	36.4
NH Naples	12	5	17	70.6
NH Rota	9	8	17	52.9
NHC Charleston	5	21	26	19.2
NHC Annapolis	0	7	7	0.0
NHC Corpus Christi	9	7	16	56.3
NH Guantanamo Bay	6	1	7	85.7
NHC Quantico	4	9	13	30.8
NHC Patuxent River	3	5	8	37.5
NHC Cherry Point	3	5	8	37.5
West	984	1,102	2,086	47.2
NMC San Diego	433	546	979	44.2
NH Guam-Agana	283	163	446	63.5
NH Bremerton	155	223	378	41.0
NH Okinawa	16	9	25	64.0
NH Yokosuka	17	18	35	48.6
NHC Oak Harbor Birthing Center	50	95	145	34.5
NHC Hawaii	5	7	12	41.7
NH Twentynine Palms	13	15	28	46.4
NH Camp Pendleton	8	18	26	30.8
NHC Lemoore	4	8	12	33.3

Health Analysis Department, Navy and Marine Corps Public Health Center.

Source: Military Health System Data Repository (MDR), Chemistry table, Ancillary table, Comprehensive Ambulatory / Professional Encounter Record (CAPER), Standard Inpatient Data Record (SIDR), TRICARE Encounter Data - Non-Institutional (TED-NI), TRICARE Encounter Data - Institutional (TED-I), July 2018.

Abbreviations: FHCC = Federal Health Care Center; Ia = Inactive; NH = Naval Hospital; NHC = Naval Health Center; NMC = Naval Medical Center; Op = Operational.



Table 4. Positive FOBTs and Colonoscopy Follow-Up by Parent MTF, 18-49 Years, FY13-17

Region & Parent MTF of FOBT	Colonoscopy Post-FOBT			No Follow-Up Evidence (%)
	No	Yes	Total	
East	2,094	1,131	3,225	64.9
James A Lovell FHCC	432	45	477	90.6
NMC Portsmouth	415	247	662	62.7
NH Jacksonville	290	232	522	55.6
NMC Camp Lejeune	265	131	396	66.9
NH Pensacola	211	162	373	56.6
NHC New England	64	97	161	39.8
NH Beaufort	119	45	164	72.6
NH Sigonella	61	18	79	77.2
NH Naples	48	21	69	69.6
NH Rota	43	15	58	74.1
NHC Charleston	41	47	88	46.6
NHC Annapolis	35	18	53	66.0
NHC Corpus Christi	23	13	36	63.9
NH Guantanamo Bay	15	2	17	88.2
NHC Quantico	11	20	31	35.5
NHC Patuxent River	11	11	22	50.0
NHC Cherry Point	10	7	17	58.8
West	901	626	1,527	59.0
NMC San Diego	245	270	515	47.6
NH Guam-Agana	86	27	113	76.1
NH Bremerton	95	69	164	57.9
NH Okinawa	173	62	235	73.6
NH Yokosuka	113	32	145	77.9
NHC Oak Harbor Birthing Center	64	73	137	46.7
NHC Hawaii	48	47	95	50.5
NH Twentynine Palms	24	16	40	60.0
NH Camp Pendleton	26	10	36	72.2
NHC Lemoore	27	20	47	57.4

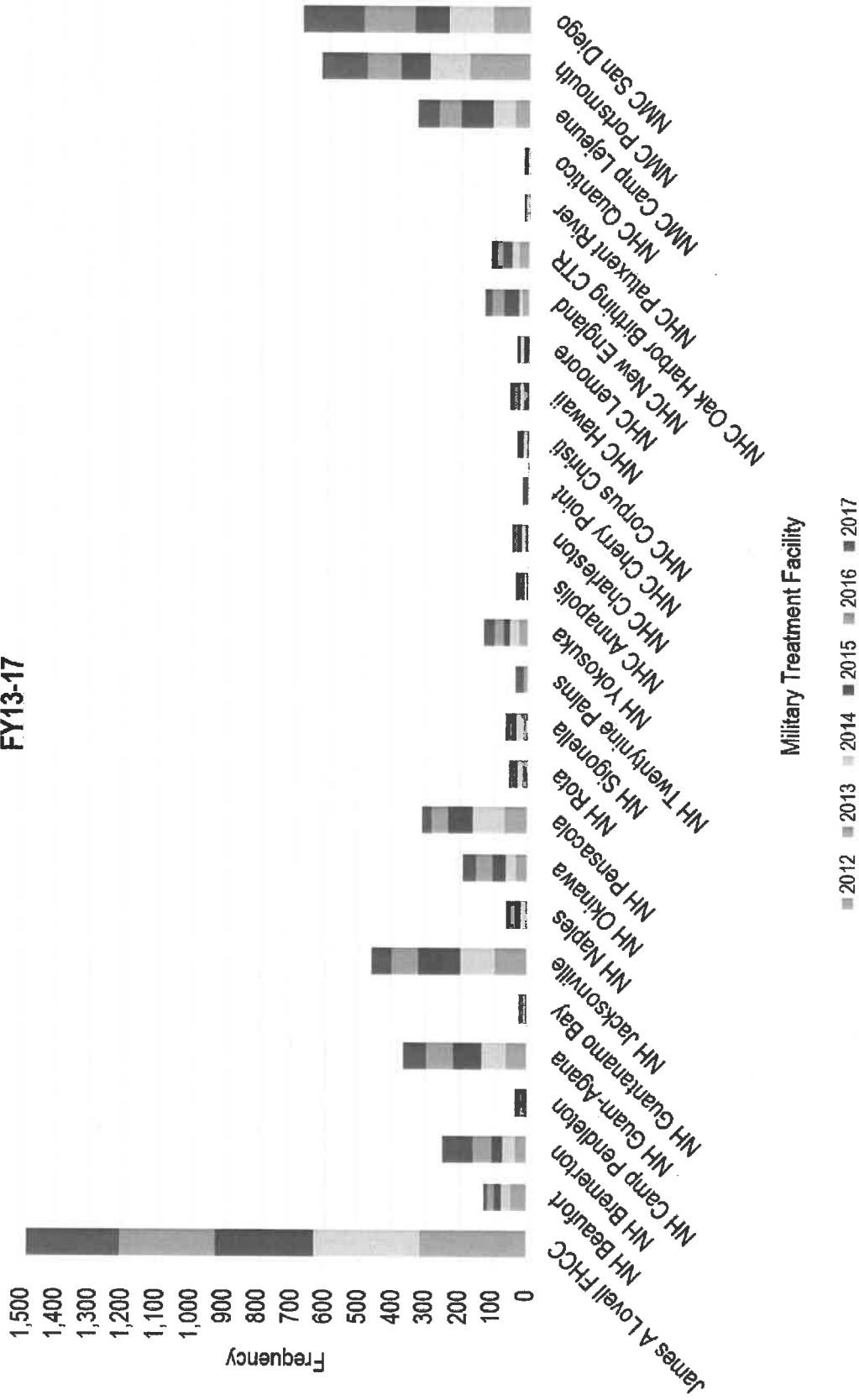
Health Analysis Department, Navy and Marine Corps Public Health Center.

Source: Military Health System Data Repository (MDR), Chemistry table, Ancillary table, Comprehensive Ambulatory / Professional Encounter Record (CAPER), Standard Inpatient Data Record (SIDR), TRICARE Encounter Data - Non-Institutional (TED-NI), TRICARE Encounter Data - Institutional (TED-I), July 2018.

Abbreviations: FHCC = Federal Health Care Center; Ia = Inactive; NH = Naval Hospital; NHC = Naval Health Center; NMC = Naval Medical Center; Op = Operational.



Figure 1. Positive FOBTs Without Evidence of Colonoscopy Follow-Up by Parent MTF, 18+ Years, FY13-17



Health Analysis Department, Navy and Marine Corps Public Health Center.
 Source: Military Health System Data Repository (MDR), Chemistry table, Ancillary table, Comprehensive Ambulatory / Professional Encounter Record (CAPER), Standard Inpatient Data Record (SIDR), TRICARE Encounter Data - Non-Institutional (TED-NI), TRICARE Encounter Data - Institutional (TED-I), July 2018.
 Abbreviations: CTR = Center, FHCC = Federal Health Care Center, FOBT = Fecal Occult Blood Test, FY = Fiscal Year, MTF = Military Treatment Facility, NH = Naval Hospital, NHC = Naval Health Center, NMC = Naval Medical Center.

