



ARMY MEDICINE

Army Medicine... Army Strong

UNCLASSIFIED//FOUO

Dental Classification Fitness and How it Relates to the Operational Force

COL Paul M. Colthirst
21 September 2021

UNCLASSIFIED//FOUO



Senior Leaders Questions/Concern

Qu. 1 “I believe that knowing before deployment who the high risk patients are could facilitate monitoring and preemptive prevention as a matter of policy to prevent DE and keep Soldiers in their formations. How can we best evaluate our data to test this thesis? Is there a favorable cost/risk benefit”?

Qu. 2 “ What are the most common Dental Emergencies treated in theater and can we some how preemptively look for the signs of these conditions just before deployment.



Dental Classification

DRC 1—Patients with a current dental examination, who do not require dental treatment or re-evaluation. DRC1 patients are worldwide deployable.

DRC 2—Patients with a current dental examination, who require non-urgent dental treatment or re-evaluation for oral conditions, which are unlikely to result in DE within 12 months—DRC 2 are considered to be worldwide deployable.

DRC 3—Patients who require urgent or emergent dental treatment—DRC 3 patients normally are not considered to be worldwide deployable.

DRC 4—Patients who require periodic dental examinations or patients with unknown dental classifications—DRC 4 patients normally are not considered to be worldwide deployable.



What is the historic d-DNBI rates Vs. Current d-DNBI rates.

TABLE II. U.S. Dental Emergency Rates by Dental Classification (by Service)^a

Study	Class 3	Class 2	Class 1	Study Variations
TSCOHS ^b 1994–1998, U.S. DoD	749	192	85	Garrison, record audit; DE plus postoperative problems; Recruits
TSCOHS 1994, U.S. DoD	169	145	80	Garrison; self-report
TSCOHS 1994–1998, U.S. Army	1127	271	139	Garrison; DE plus postoperative problems; record audit; Recruits
Sinai 1987, U.S. Army	530	145	67	Deployed ; no treatment during deployment; dental officer reports
Bosnia 2000, U.S. Army	—	185	121	Deployed ; no class 3s deployed; record audit
TSCOHS 1994–1998, U.S. Marines	529	135	32	Garrison; DE plus postoperative problems; record audit; Recruits
NIDBR 2004, U.S. Marines	214	77 ^c		Deployed ; record audit; DE plus postoperative problems
NIDBR 1997, U.S. Navy	536	130	97	Garrison; DE plus postoperative problems; dental officer reports
TSCOHS 1994–1998, U.S. Navy	524	118	75	Garrison; record audit; DE plus postoperative problems; Recruits
NIDBR 1997–2001, U.S. Navy	244	111 ^c		Garrison; DE did not count postoperative problems; record audit; Recruits
NIDBR 1997, U.S. Navy	96	53	35	Deployed ; dental officer report; DE plus postoperative problems
TSCOHS 1994–1998, U.S. Air Force	1193	238	81	Garrison; DE plus postoperative problems; record audit; Recruits

*DRC3 Service Members are more likely to experience a DE than DRC 2 and DRC1 Service Members.

**Current DNBI Rate: in OIF/OND was 124.5 per 1,000 Soldiers per year (~12%) and 83.6 in OEF (~8%) 2010-2012



DRC 1 Changes Over Time Vs. DE Rates

Dental Readiness Class 1 Rates Among U.S. Army Soldiers Over Time (December 2009 to December 2012)

	December 2009	December 2010	December 2011	December 2012
Active Duty	19.6%	20%	23.2%	29%
USAR	14.6%	18.8%	18.8%	19%
Guard	16.3%	19.1%	24.8%	27.8%

Decreases in D-DNBI rates over time for both theaters may have been as a result of improvements in Dental Readiness Class 1 (DRC 1) status prior to deployment.

Deployment (yrs)	DRC1 (%)	DRC2 (%)	DRC3 (%)	DRC4 (%)	DE Rate (per 1000)
2009	20	79	<0.5	<0.5	105
2010*	20	79	<0.5	<0.5	135
2011	23	76	<0.5	<0.5	113
2012	29	70	<0.5	<0.5	*

MILITARY MEDICINE, 180, 5:570, 2015

Risk of Dental Disease Non-Battle Injuries and Severity of Dental Disease in Deployed U.S. Army Personnel

Barbara E. Wojcik, PhD*; Wioletta Szeszel-Fedorowicz, PhD*; Rebecca J. Humphrey, MA*; LTC Paul Colthirst, DC USA*f; Alicia C. Guerrero, MPH*; John. Simecek, DDS, MPH±; Adam Fedorowicz, PhD*; COL Steven Eikenberg, DC USA§; COL Georgia G. Rogers, DC USA//; COL Philip DeNicolo, DC USA



Comparison of Dental Emergencies Rates

Incidence of Dental Disease Nonbattle Injuries in Deployed U.S. Army Personnel

Annual U.S. Army Component Group and Overall D-DNBI Rates per 1,000 Soldiers per Year by Operation: 2009–2012

Calendar Years	Operation Iraqi Freedom/Operation New Dawn ^a				Operation Enduring Freedom			
	Active Duty	National Guard	Army Reserve	Total	Active Duty	National Guard	Army Reserve	Total
2009	105.54	125.38	163.80	116.30	N/A ^b	N/A	N/A	N/A
2010	135.77	151.39	183.76	144.05	N/A	N/A	N/A	N/A
2011	113.29	101.87	138.22	113.17	68.89	131.46	130.43	81.44
2012	N/A	N/A	N/A	N/A	72.48	129.38	129.52	85.77

^aAnnual Dental-DNBI rates for Army Soldiers serving in Operation Iraqi Freedom/Operation New Dawn in 2009 year were calculated based on D-DNBI rates between 1 August, 2009 and 31 December, 2009 and then extrapolated to annual rates for year 2009. ^bN/A indicates D-DNBI data were not available or were in the early stage of implementation.

Army Reserve and National Guard groups have higher D-DNBI annual rates compared to AD in both campaigns and in all years, however, differences were more pronounced in OEF.

Cited from:

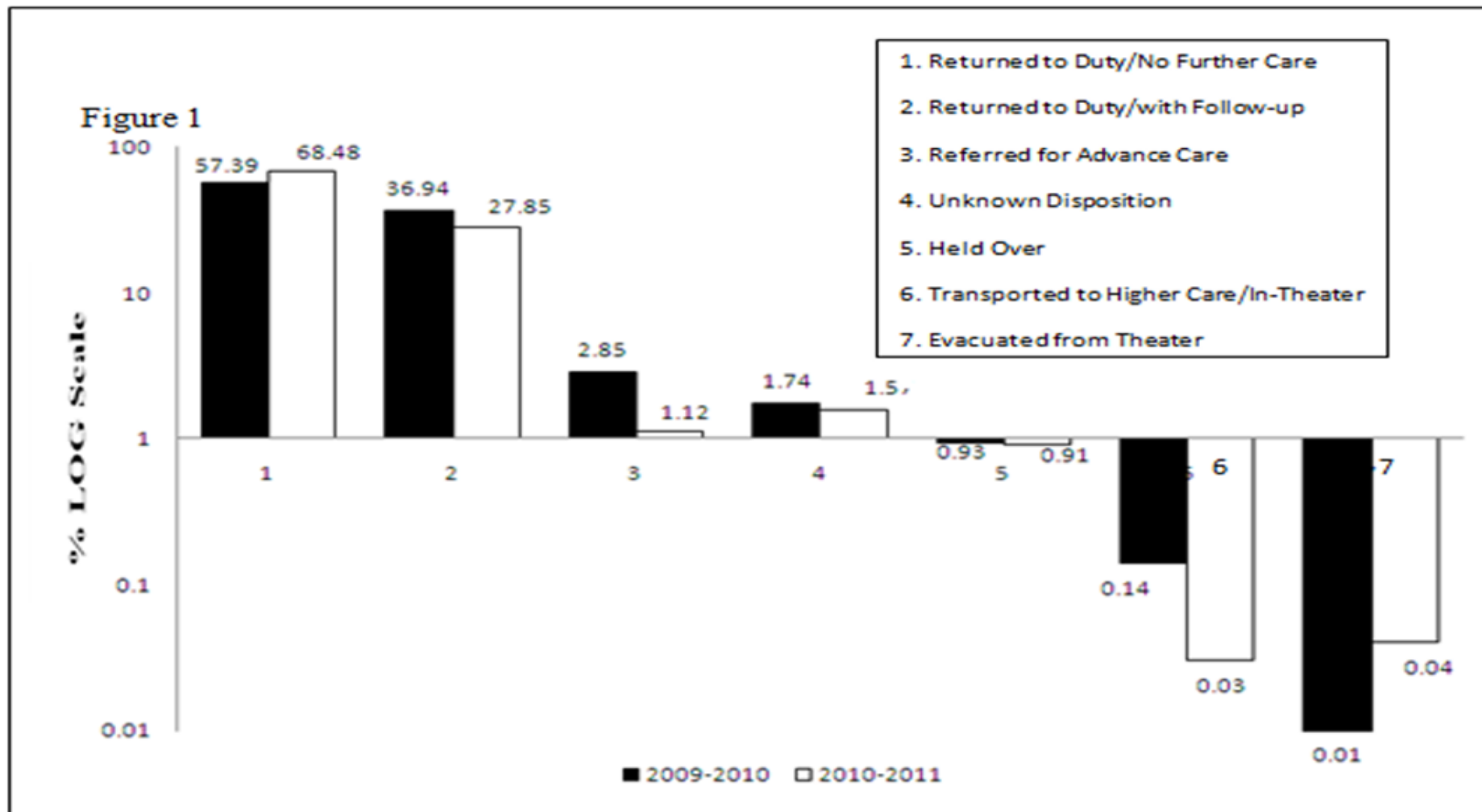
MILITARY MEDICINE, 179, 6:666, 2014

The Incidence of Dental Disease Nonbattle Injuries in Deployed U.S. Army Personnel. John W. Simecek, DDS, MPH*; MAJ Paul Colthirst, DC USA†; Barbara E. Wojcik, PhD‡; COL Steven Eikenberg, DC USA§; Alicia C. Guerrero, MPH‡; Adam Fedorowicz, PhD‡; Wioletta Szeszel-Fedorowicz, PhD‡; COL Philip DeNicolo, DC USA†



Operational Significance

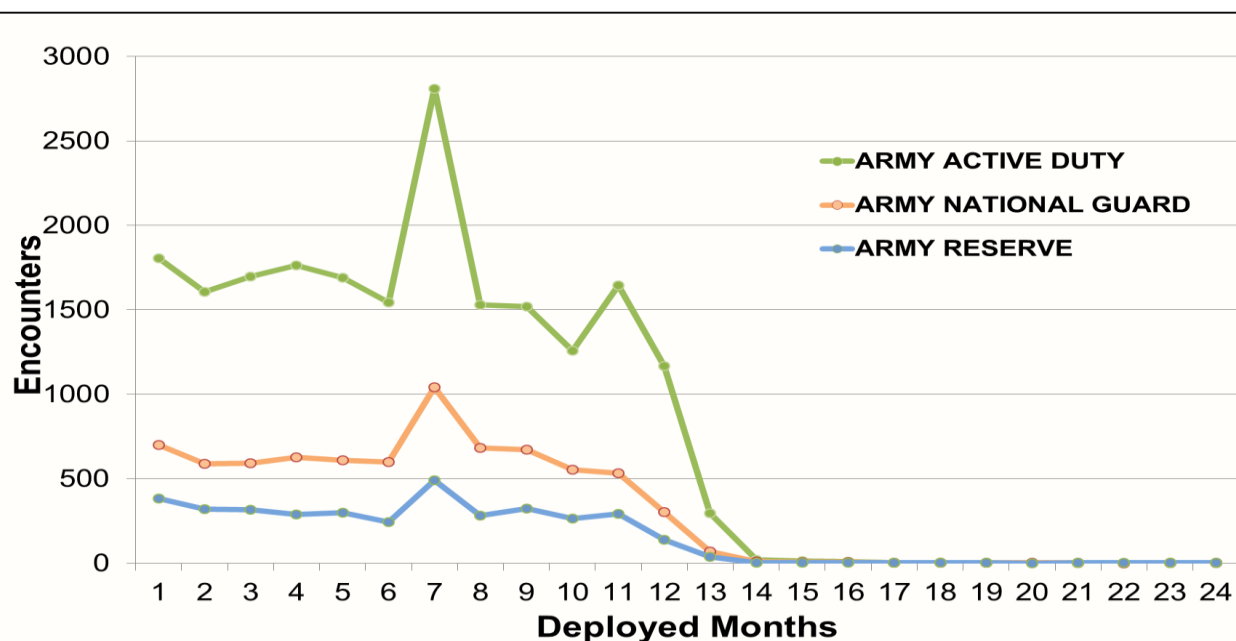
Figure 1. Disposition comparison of soldiers receiving dental care in fiscal years 2009-2010 and 2010-2011





DE at the 7th Month

Army (DoD) Dental Readiness Standard: 95%



Graph1 presents distributions of all DE encounters from the time of deployment stratified by component. This graph demonstrates a similar pattern for all components; one peak in DE admissions during the first month of deployment, and another more pronounced peak at the seventh month after deployment.

Assessment:

1. The 7th month of deployment raises additional questions which can't be explained without additional information and analysis. Currently, we are conducting a Profile Analysis, (looking at characteristics of SM who fall into this category, i.e. predeployment treatment, location, etc.) and the distribution of the specific DE causing conditions over time
2. Are emergencies due to "Just in Time Dental care" (Study is being developed)
3. Decrease readiness results in increased cost (financial, unit burden, mission degradation, and decrease combat effectiveness)
4. Preliminary finding show that DRC1 have on average > 400 days to a DE; DRC2 <365; and DRC3 <250



SYMPTOMS ASSOCIATED WITH DENTAL PROBLEM

	Operation							
Symptom	OEF		OIF		Unknown		Total	
Difficulty working	2103	36.51%	5159	34.45%	154	34.53%	7416	35.01%
Difficulty relaxing	1714	29.76%	5302	35.41%	158	35.43%	7174	33.87%
Difficulty sleeping	1943	33.73%	4513	30.14%	134	30.04%	6590	31.11%
<i>Total</i>	<i>5760</i>	<i>100.0%</i>	<i>14974</i>	<i>100.0%</i>	<i>446</i>	<i>100.0%</i>	<i>21180</i>	<i>100.0%</i>



Most Frequent Dental Emergencies from 2009-2012

Summary and Ranking of Most Frequent 15 Diagnoses for D-DNBI Encounters Among U.S. Army Soldiers
in Operations Iraqi Freedom and Enduring Freedom Combined

Diagnosis	Active Duty		National Guard		Reserve		Overall Army	
	Rank ^a	%	Rank ^a	%	Rank ^a	%	Rank ^a	%
Dental Caries	1	10.14%	1	10.34	2	8.59	1	10.00
Fractured Tooth–No Caries	2	9.73	2	10.03	1	9.79	2	9.81
Defective–Caries	3	9.02	3	8.83	4	7.98	3	8.85
Defective–No Caries	4	7.07	4	6.99	5	7.55	4	7.11
Gingivitis	7	5.81	5	6.97	3	8.41	5	6.40
Pulpitis	5	6.19	6	5.34	7	4.85	6	5.83
Fractured Tooth–Caries	6	5.88	7	5.71	8	4.68	7	5.69
Eruption Pain	9	5.10	8	4.88	9	4.65	8	4.99
Necrotic Pulp	8	5.23	10	4.20	12	3.88	9	4.82
Pericoronitis	10	4.49	9	4.82	6	4.95	10	4.63
Dentinal Hypersensitivity	12	3.30	11	3.48	10	4.58	11	3.50
Not Elsewhere Specified	11	3.44	12	3.37	15	2.72	12	3.34
Pulpless	13	3.01	13	3.24	11	4.03	13	3.19
Periradicular Periodontitis	14	2.88	14	2.55	13	2.92	14	2.80
Periradicular Abscess	15	2.17	16	2.32	16	2.17	15	2.21

^aRanking order determined by ranking for U.S. Army based on combined data from Operations Iraqi Freedom/New Dawn and Enduring Freedom.



Characteristics of Risks

Risk of Dental Disease Nonbattle Injuries and Severity of Dental Disease

Results of Poisson Regression of Dental Disease and Non-Battle Injuries in Operation Iraqi Freedom/New Dawn (May 1, 2009 to December 31, 2011) and Operation Enduring Freedom (January 1, 2011 to December 31, 2012)

Characteristics	Operation Iraqi Freedom/Operation New Dawn			Operation Enduring Freedom		
	RR	<i>p</i> *	95% CI	RR	<i>p</i> *	95% CI
Gender						
Female/Male	1.54	<0.0001	1.46–1.64	1.76	<0.0001	1.64–1.89
Age Group						
<20/20 to 29	1.06	0.2784	0.96–1.17	0.84	0.0189	0.73–0.97
30 to 39/20 to 29	0.96	0.1866	0.91–1.02	1.05	0.1310	0.99–1.12
40 to 49/20 to 29	1.25	<0.0001	1.17–1.34	1.32	<0.0001	1.21–1.43
50+/20 to 29	1.45	<0.0001	1.27–1.66	1.80	<0.0001	1.53–2.11
Component						
National Guard/Active Duty	1.02	0.5060	0.97–1.07	1.73	<0.0001	1.62–1.85
Reserve/Active Duty	1.17	<0.0001	1.09–1.25	1.51	<0.0001	1.38–1.66
Unit Category						
Combat Support/Combat	1.12	0.0005	1.05–1.19	0.99	0.7244	0.92–1.06
Combat Service Support/Combat ^a	1.12	<0.0001	1.06–1.18	1.24	<0.0001	1.16–1.33
Medical/Combat ^a	1.69	<0.0001	1.52–1.88	1.98	<0.0001	1.70–2.32
Grade						
Enlisted/Officer	1.07	0.0479	1.01–1.14	1.16	<0.0001	1.08–1.26

Reference categories: Male, 20 to 29 age group; Active Duty; Combat Unit and Officers. RR, relative risk; CI, confidence interval. ^aMedical category was extracted from the Combat Service Support Category. *Values in boldface imply statistically significant RR at the 0.05 level of significance.



Characteristics of Severity

Logistic Regression Results Predicting a High Severity Dental Disease and Non-Battle Injury Among U.S. Army Soldiers Deployed to Iraq (May 1, 2009 to December 31, 2011) and Afghanistan (January 1, 2011 to December 31, 2012)

Characteristic	Operation Iraqi Freedom/ Operation New Dawn		Operation Enduring Freedom	
	OR (95% CI)		OR (95% CI)	
Gender				
Male				
(Reference)				
Female	0.766*	(0.622, 0.933)	0.801	(0.539, 1.153)
Component				
Regular (AD)				
(Reference)				
National Guard	0.936	(0.795, 1.099)	0.884	(0.639, 1.203)
Reserve	1.042	(0.835, 1.290)	0.496*	(0.269, 0.846)
Unit Category				
Combat				
(Reference)				
Combat Support	0.909	(0.740, 1.110)	0.818	(0.572, 1.152)
Combat Service	1.104	(0.946, 1.288)	0.910	(0.684, 1.203)
Support ^a				
Deployed Months	0.990	(0.971, 1.009)	1.046*	(1.008, 1.086)



High Severity Diagnosis

Three Most Frequently Reported High Severity Diagnoses for U.S. Army Soldiers Deployed in OIF/OND (May 1, 2009 to December 31, 2011) and OEF (January 1, 2011 to December 31, 2012) by Component

Diagnoses ^a	AD		National Guard		Reserve		Total U.S. Army	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
OIF/OND								
Necrotizing Ulcerative Gingivitis	220	36.48	81	36.67	74	58.27	375	39.68
Fractured Tooth	106	17.58	32	14.88	15	11.81	153	16.19
Anatomic Space Infection-Endodontic	82	13.60	30	13.95	13	10.24	125	13.23
Total	408	67.66	143	65.50	102	80.32	653	69.10
OEF								
Fractured Tooth	107	46.72	23	39.66	9	47.37	139	45.42
Anatomic Space Infection-Endodontic	37	16.16	6	10.34	4	21.05	47	15.36
Necrotizing Ulcerative Gingivitis	31	13.54	12	20.69	4	21.05	47	15.36
Total	175	76.42	41	70.69	17	89.47	233	76.14

OIF, Operation Iraqi Freedom; OND, Operation New Dawn; OEF, Operation Enduring Freedom. ^aWe are presenting only three most frequent diagnoses by component; therefore, percentages will not add to 100%.



Current Observation and Conclusion

- Lack of dental support in close proximity to troops will increase the number of medical evacuations required to treat the High and Moderate severity D-DNBI. Dental Care becomes more concerning in a A2/AD Environment
- Additional research and development initiatives should be initiated to provide materials and/or devices that Corpsmen/Medics could use to provide palliative treatment for D-DNBI in theater.
- Surveillance should continue to monitor D-DNBI trends in military personnel during combat, deployment, and while in garrison.



ARMY MEDICINE

Army Medicine... Army Strong

UNCLASSIFIED//FOUO

QUESTIONS

UNCLASSIFIED//FOUO