


Gulf War Illness (GWI): Need for an ICD-10-CM Diagnostic Code

**Presenter: Beatrice Alexandra Golomb, MD, PhD
Professor of Medicine
UC San Diego School of Medicine**

**On behalf of the consortium of GWI clinicians, researchers,
and patient advocates**

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Overview

- Gulf War had unprecedented exposures
- Many who served became ill
- GWI is tied causally to drugs/chemicals
- GWI is defined by symptoms
- Many objective markers are altered
- GWI has  risk of comorbidities
- An ICD-10-CM code is needed!

The 1990-1991 Gulf War Had Unprecedented Exposures

- Not excessive stress: Ground war only 4 days, many never saw combat
- Many new, unique, excessive exposures^{1,2}, e.g.:
 - Pyridostigmine bromide (PB)^{3,4}: Nerve agent protection pill
 - Pesticides^{3,5,6}: E.g. organophosphates, carbamates, pyrethroids
 - Nerve gas (organophosphate)^{3,7}: Sarin, cyclosarin

Many Who Served Became Ill

- Fraction ill = $\sim 1/3$ (subtracting fraction ill in non-deployed)
- Consistent across multiple studies¹⁻⁵

GWI Tied (Causally) to Drugs/Chemicals

- E.g.: Pyridostigmine bromide (PB): nerve agent protection pill

1. Dose response^{1,2}: $P < 0.0001$

PB pill #	0	1-2	3-10	~22-42	~>42
% ill	16	23	32	42	75

2. Gene-environment interaction³: BChE* Genetics

	Usual Alleles	Rare Allele
OR [†] for Illness with PB	2.7	40
(95% CI)	(1.62-4.44)	(3.58-447)

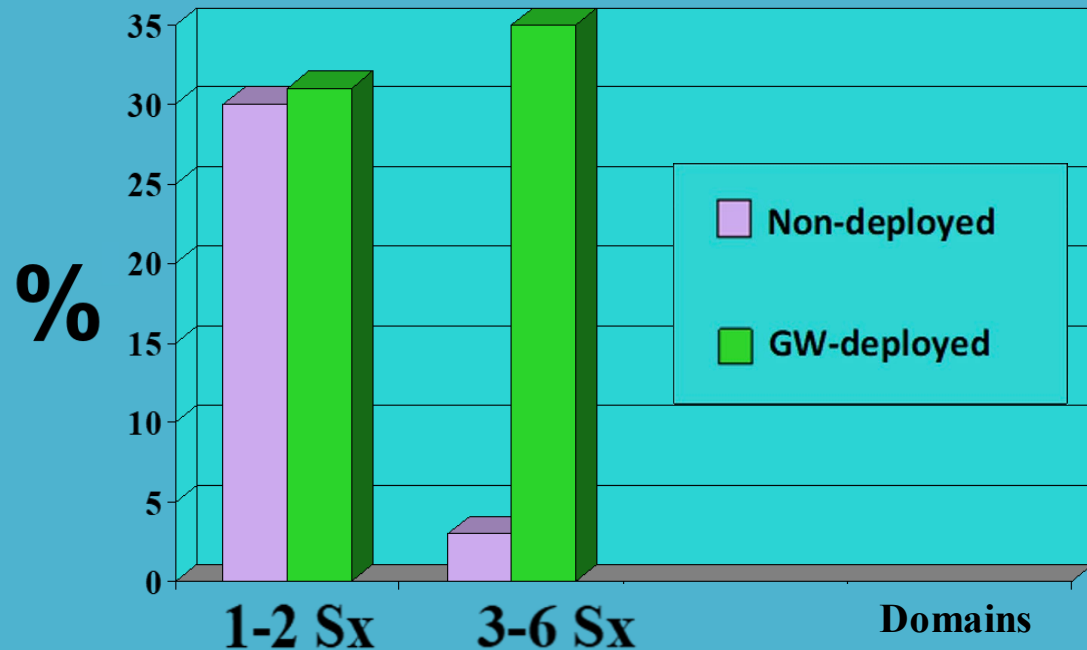
3. Meets Hill's Criteria for Causality¹

*BChE = butyrylcholinesterase – detoxifies PB

[†]OR = odds ratio

GWV is Defined by Symptoms (and Deployment)

- GWV is defined by complex of symptoms that occur in domains that are highly consistent across Gulf War veteran populations and studies^{1,2}



Y axis: % reporting this number of symptom domains

Kansas GWV criteria

Chronic symptoms (≥ 6 months*), either multiple or $>$ mild, in at least

3 of 6 domains:

- Neurological
- Fatigue/sleep
- Respiratory
- Pain
- GI
- Skin

- Modified Kansas criteria for ICD: Exclusions required for research homogeneity include conditions that GWV increases risk of – not disqualifications clinically.

*Most with GWV have had symptoms persist for greater than 30 years

GWI: Many Objective Markers are Altered

- ↓ Mitochondrial function/bioenergetics¹⁻³ (also GWI animal models)^{4,5}
- Δ Lipidomics, lipid products⁶⁻⁸ (also GWI animal models)⁹⁻¹¹
- ↑ Inflammation (mild), coagulation¹²⁻¹⁴
- ↑ Neuroinflammation¹⁵ (also GWI animal models)^{16,17}
- ↑ Autoantibodies¹⁸⁻²⁰
- ↑ Autonomic dysfunction²¹⁻²³
- Δ Hormones²⁴⁻²⁶
- ↓ Natural killer cells (number, activity)^{18,27,28}
- ↓ Brain gray matter; white matter changes²⁹⁻³¹

GWI: Increased Risk of Comorbidities

- ALS (early years only)¹⁻³
- Hypertension⁴⁻⁹
- Heart disease^{7,10,11}
- Infection¹⁰
- Sleep apnea^{12,13}
- “Overlap conditions”: CFS^{4,6,8,13-15}, MCS^{4,6,13,15,18,19}, fibromyalgia^{14,16,17}, IBS^{6,17}

ALS = amyotrophic lateral sclerosis; CFS = chronic fatigue syndrome;
MCS = multiple chemical sensitivity; IBS = irritable bowel syndrome

GWJ is Not Captured in Other Diagnoses

- Not PTSD
 - Combat stress shows no independent association to GWJ (in studies that control for other exposures)¹
- Not TBI (traumatic brain injury)
- Not depression
 - Antidepressants among the worst treatments per many veterans' reports
- Not psychologically driven/psychiatric
 - Those without psychiatric symptoms have ~as much physical impairment as those with²

An ICD-10-CM Code is Needed!

- Federal research funds for GWI – 44 clinical studies, 9 patents, 277 papers – still no ICD-10-CM code
- An ICD-10-CM code is needed to aid:
 - Research
 - Epidemiological tracking
 - Clinicians:
 - No ICD-10-CM code = GWI doesn't exist
 - Wrong treatments, referrals
 - Diagnosis (code) points doctor to correct literature – helps them help patients
 - Patients:
 - Terrible care experience for many¹

Feb. 2023 RAC meeting: Veterans again plead for GWI ICD-10-CM code

Recap

- Gulf War typified by heavy exposures: e.g., PB, pesticides, sarin
- ~1/3 became ill as a result: few improved¹⁻³
- Chemicals (not stress) relate causally to illness
- GWI is defined by symptoms (and deployment)
- Many objective markers are altered
- Many comorbidities are increased
- An ICD-10-CM code is needed
 - No other ICD-10-CM code answers!

Submitting Consortium Highly Credentialed in GWI

- Consortium of GWI clinicians, researchers, patient advocates
- Directors of patient clinics focused on GWI
- 37 GWI DoD grants as PI
- 179 GWI publications (PubMed)
- 3 scientific directors of congressionally-charged Research Advisory Committee on GWI (RAC)
- 3 RAND reports
- Invited to testify for ~every NAS, NAM, IOM committee on GWI
- Testimony to Congress (many times) – also House of Lords (UK)
- Developed validated (Kansas) GWI diagnostic criteria
- Directors of GWI Biobank, GWI clinical trial consortium
- 2 heads of overall DoD GWI research program panel
- Chaired many individual research award review committees
- Membership on VA GW Steering Committee (1st GWI research strategic plan)
- Clinical experience with countless affected veterans

Participate in our GWI Research!

- Contact us at:
- golombresearch@health.ucsd.edu
- www.golombresearchgroup.org

