Chronic Pain, Indoor Mold Exposure, Mycotoxins & Methylation

James N. Dillard, MD, DC, LAc
Private Practice & Clinical Research, New York, NY
Associate Clinical Professor (retired)
Columbia University College of Physicians & Surgeons
Columbia University Medical Center
Beth Israel Medical Center, Pain Medicine
University of Arizona, Nutrition & Health
DrDillard.com

COLUMBIA UNIVERSITY

College of Physicians and Surgeons

3rd Annual Course

INTEGRATIVE PAIN MEDICINE

Friday & Saturday,
April 16 & 17, 2004

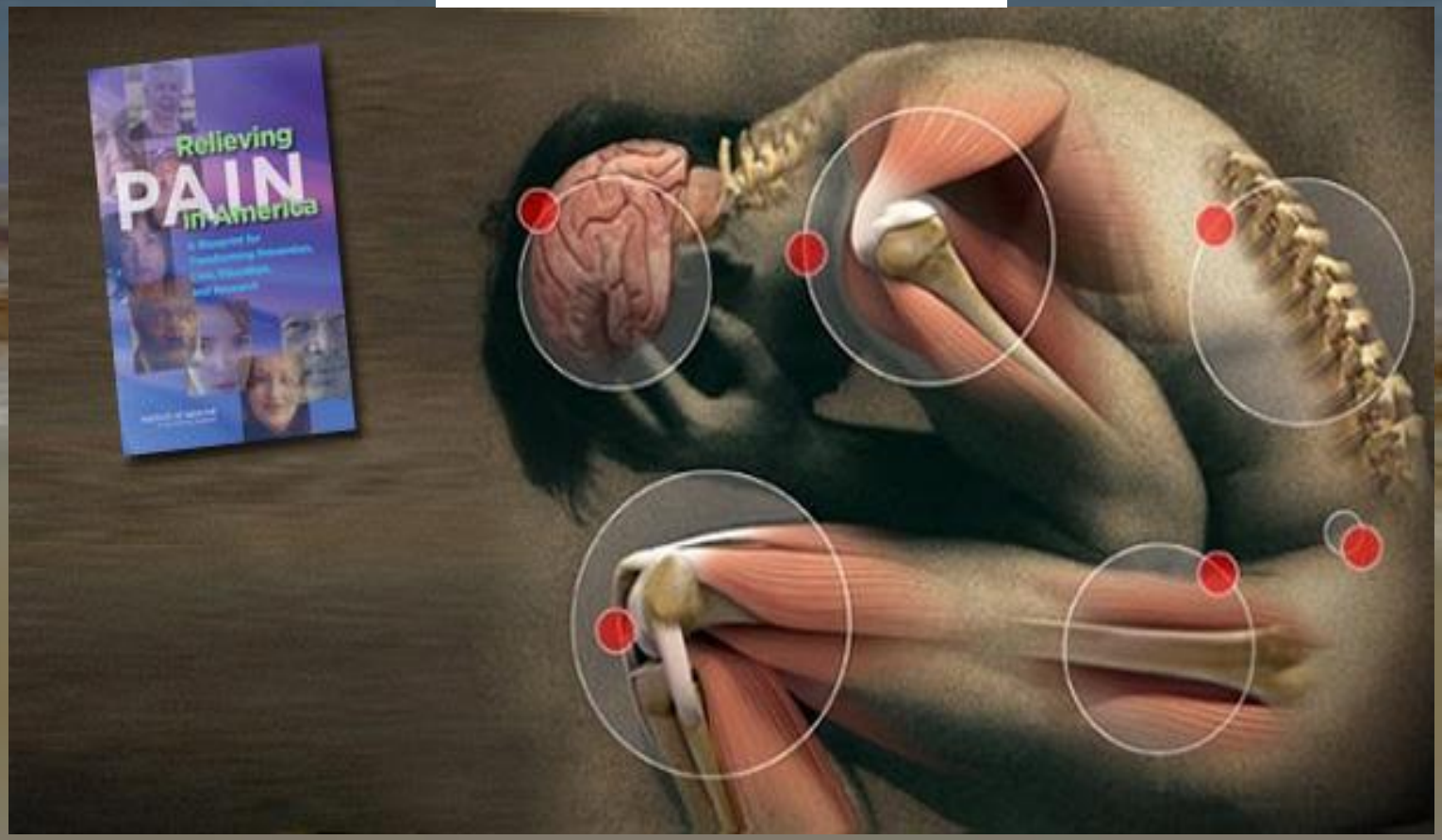
at

Columbia University Medical Center
New York, New York


Dr. Jack Thrasher
Toxicologist - Health And Safety Advocate

INSTITUTE OF MEDICINE

OF THE NATIONAL ACADEMIES



Chronic Pain Prevalence in the U.S.

- > 100 million Americans, 1 in 3 people
- **Disables** more people than Heart Disease, Diabetes & Cancer combined
- > $630 billion economic loss per year
- U.S. Defense Budget $716 billion in 2018
- Chronic Pain **poorly understood**, poorly treated
- from - *Institute of Medicine (IOM) of The National Academies, June 2011, Relieving Pain in America*
- **Now we have a massive opioid crisis**


MARCH 7, 2011
Special Double Health Issue
It's time for unions to change
BY JOE KLEIN
Muammar Gaddafi's last stand
FOOTBALL
Are you ready for a lockout?
5 THINGS YOU DON'T HAVE TO WORRY ABOUT THIS WEEK
PAGE 95
TIME
UNDERSTANDING
PAIN


YUNGHI KIM © 1997

Chronic Nerve (neuropathic) Pain (NeP)

- Prevalence of NeP ~ 20 – 32% in general population
- Higher in other populations - chronic illness, Blacks, Hispanics, elderly
- NeP is caused by **Nerve Damage** (injury to nerves)
- 40 – 50 % of Chronic NeP is **idiopathic** (cause unknown)
- Nerve pain described as the feeling of being pricked with pins and needles, shocked by electricity, or may include numbness, burning, shooting or tingling
- *DeBonaventura MD. J Pain Res 2017; 10: 2525–2538.*

Chronic Nerve Pain (NeP)

- **Known** Causes - Diabetes, Alcoholism, Metabolic, Chemotherapy, Uremia, Toxic exposures, Infectious
- Higher Rates of Psychiatric Comorbidities in NeP
- Headache – 41%
- Anxiety – 38%
- Depression – 34%
- Insomnia – 34%
- Difficult to treat – SNRIs, Anti-Epileptics, Tricyclics
- High rates of Adverse Reactions, medication intolerance – NSAIDs, Opioids

Mold & Mycotoxins: Nerve & Immune Damage

- Molds produce Mycotoxins (MCT) – Trichothecenes, Aflatoxin, Ochratoxin, Chaetoglobocin, Sterigmatocystin, Gliotoxin – toxic particles, nano-particles & VOCs
- Molds shed toxic **Antigenic** Spores, Hyphae fragments, Polysaccharides, Enzymes
- Cause wide-ranging neurological & immune system damage/distortion in Parts Per Billion (PPB) levels
- *Campbell, AW. Thrasher JD. Mold and Mycotoxins: Effects on the Neurological and Immune Systems in Humans. Advances in Applied Microbiology 55C (375-406) 2004*

Toxic Mold Syndrome

- A constellation of adverse symptoms from mold exposure
- Defined - Levy & Fink, Adv Appl Microbiol (55) 2004
- Multiple adverse neuropsychiatric effects from mold mycotoxins, fragments & VOCs
- Affecting multiple organ systems – lungs, immune cells, musculoskeletal, central & peripheral nervous system
- Now associated with Autism Spectrum Disorder
- *Ratnaseelan AN. Effects of Mycotoxins on Neuropsychiatric Symptoms and Immune Processes. Clinical Therapeutics 40(6) June 2018*

The Neurologic & Neuropsychiatric Syndrome

- Larry Empting, MD, has characterized this syndrome
- Nerve & Brain injury - "in sensitive or vulnerable individuals there are clear neurologic and neuropsychiatric effects"
- Symptoms include migraine & facial pain, focal neuralgias, neuropathic pain patterns, ataxia, "brain fog" delirium/attention/memory/cognitive loss
- Work-up must be rigorous to rule-out other diagnoses
- *Empting LD. Neurologic and neuropsychiatric syndrome features of mold and mycotoxin exposure. Toxicology & Industrial Health 25(9-10) 2009*

Our Data

- A cohort of 24 chronic NeP pain patients
- Otherwise well before being exposed to well-documented indoor mold
- Good **temporal** relationship between mold exposure and the onset of symptoms
- Rigorous medical and neurological work-ups did not reveal any other explanatory diagnosis for NeP
- Most had been told that these new-onset symptoms were "all in their head" by multiple neurologists
- Universally poor responses to conventional medications for neuropathic pain

Our Data of 24 patients with Chronic Idiopathic Nerve Pain

- 14 female, 10 males
- Documented indoor mold exposure in **well people**
- No allergic symptoms, no known history of immunocompromise
- 9 had recurrent exposures, 3 exposed while pregnant
- 5 had a simultaneously sick pet
- 18 (75%) had **visible** mold on inspection of the home
- 13 (54%) had mold & mycotoxin contamination documented in the HVAC ducts/filters
- 17 (71%) moved out, only 1 got better
- 9 took contaminated papers and soft items with them

Our Data of 24 Idiopathic Chronic NeP

- Signs, Symptoms & function impairments **not trivial**
- 66% suffered documented functional disability
- 8 dropped out of school
- 5 lost their job
- 30% had permanent disability
- 58% had documented **cognitive** impairment
- 4 diagnosed with toxic encephalopathy
- 5 had immune deficiencies
- 1 died

Our Data of 24 Contaminated Homes/Workplace

- All had high ERMI scores, when done
- 23 + indoor mycotoxins, 16 + mold PCR
- 19 + spores & hyphae fragments on air trap
- 23 indoor Aspergillus/Penicillium
- 21 indoor Chaetomium found, 11 airborne
- 18 indoor Stachybotrys found
- 16 indoor Mucor/Rhizopus found
- 15 indoor Alternaria found
- 15 indoor Cladosporium

Our Data of 24

- 87% had moderate – severe nerve pain without other diagnosis
- 71% had loss of nasal hair/raw mucosal inflammation
- 66% had new-onset headache
- 58% had new-onset GI symptoms
- 50% new skin rashes
- 33% scalp alopecia
- 46% new cough, shortness of breath/wheezing/black-brown marked sputum/hemoptysis
- 79% + urine mycotoxins
- 66% + specific fungal IgGs matching the same mold species found in the environment

Risk Evaluation Data for the 24

- 21% had some clear mucosal barrier breakdown
- 71% - low blood Vitamin D levels
- 66% - one or more MTHFR abnormalities (SNPs)
- 50% - low blood Vitamin A levels
- 46% - self-reported “poor diet”
- 43% - low blood Zinc levels
- 29% - low blood Copper levels

Methylenetetrahydrofolate Reductase (MTHFR)

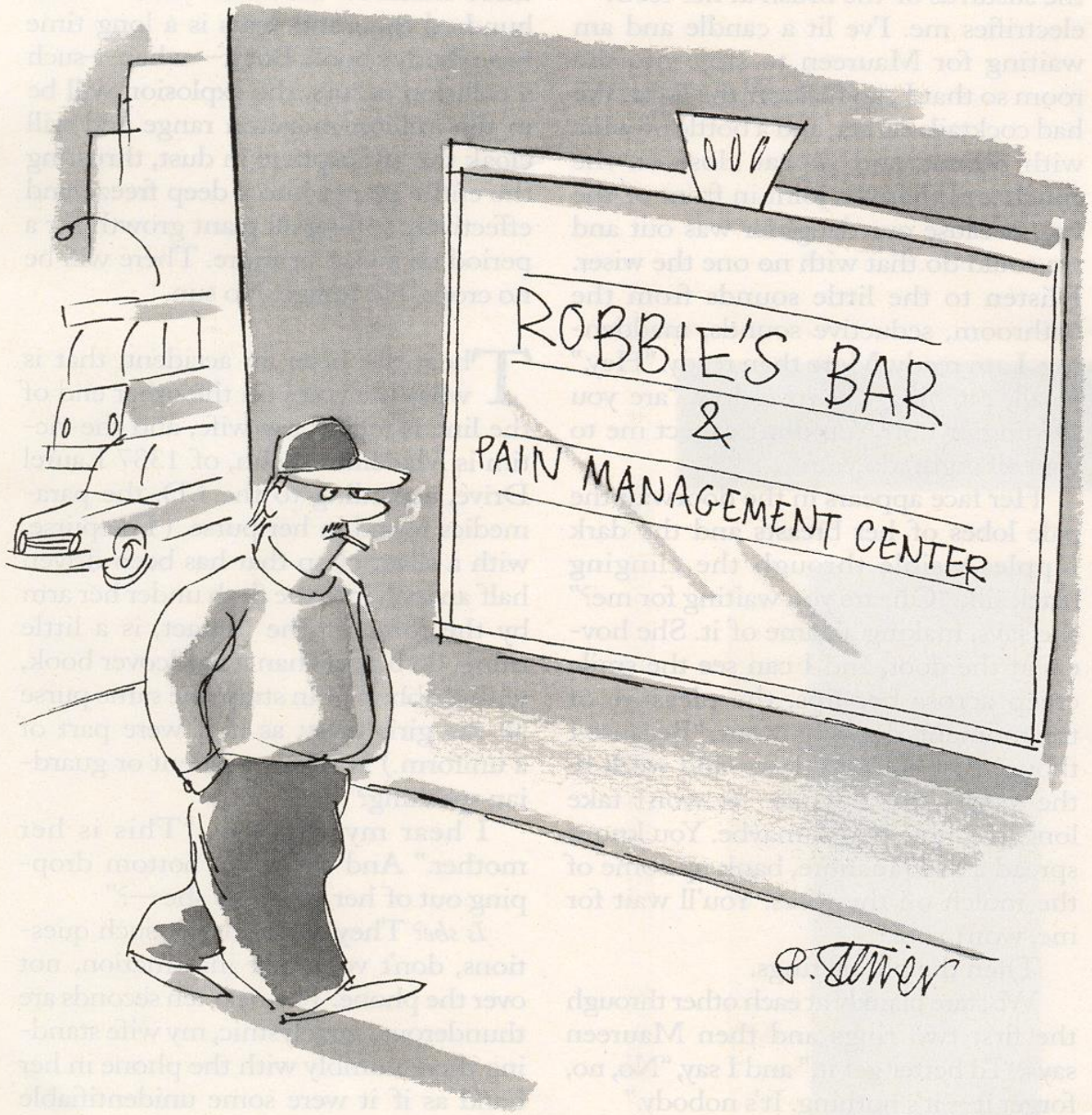
- Single carbon transfer in multiple metabolic pathways
- Production of intracellular glutathione
- 6-14% of general population has one SNP
- Homozygous C677T status lowers methylation by 70%
- Originally associated with elevated homocysteine, CAD
- MTHFR variants associated with enhanced adverse sensitivity to alcohol toxicity, arsenic, hydroxyurea, methotrexate, capecitabine, 6-Mercaptopurine, 5-fluorouracil, and adverse events after vaccination
- Impaired detoxification - Exaggerated injury from toxic insults, many citations

New Recommendations for Chronic NeP Patients

- Discontinue mold exposure - ASAP
- Get urinary mycotoxin levels, specific fungal IgGs
- Which molds were found in the indoor environment?
- Evaluate for poor nutritional status – improve this
- Vitamin D & A, Zinc, Copper, other nutritional deficiencies
- MTHFR analysis
- Screen for immune deficits - cellular & humoral impairments
- Rule out other causes for neuropathic pain

Further Research on Chronic Pain and Fungi

- Collaboration with toxicologists, veterinarians, mycobiologists, environmental health researchers
- Enlarge the cohort numbers (n)
- Establish guidelines for idiopathic chronic pain patients investigating for mold exposure, physical damage & abnormal labs, **"Have you been heavily exposed to mold?"** Risk analysis and search for co-morbidities
- Study for abnormalities in other detoxification enzymes & factors, cytochromes, glutathione synthetase
- Further risk stratification for larger groups
- Further investigation on Chaetomium exposure & pain
- Small fiber neuropathy – by skin biopsy nerve density


ROBBIE'S BAR
&
PAIN MANAGEMENT CENTER

"Praise and blame, gain and loss, pleasure and sorrow come and go like the wind. To be happy, rest like a giant tree, in the midst of them all."

~ Gautama Buddha

There is always more investigation to be done…

Thank You!

James N. Dillard, MD
New York, NY
1.917.533.4484
jndillard@mindspring.com