The Metabolic Breakdown of Post Traumatic Stress Disorder (PTSD) and Prevention Strategies

A Webinar with UW/Harborview Abuse & Trauma Center (HATC)

Presented by:
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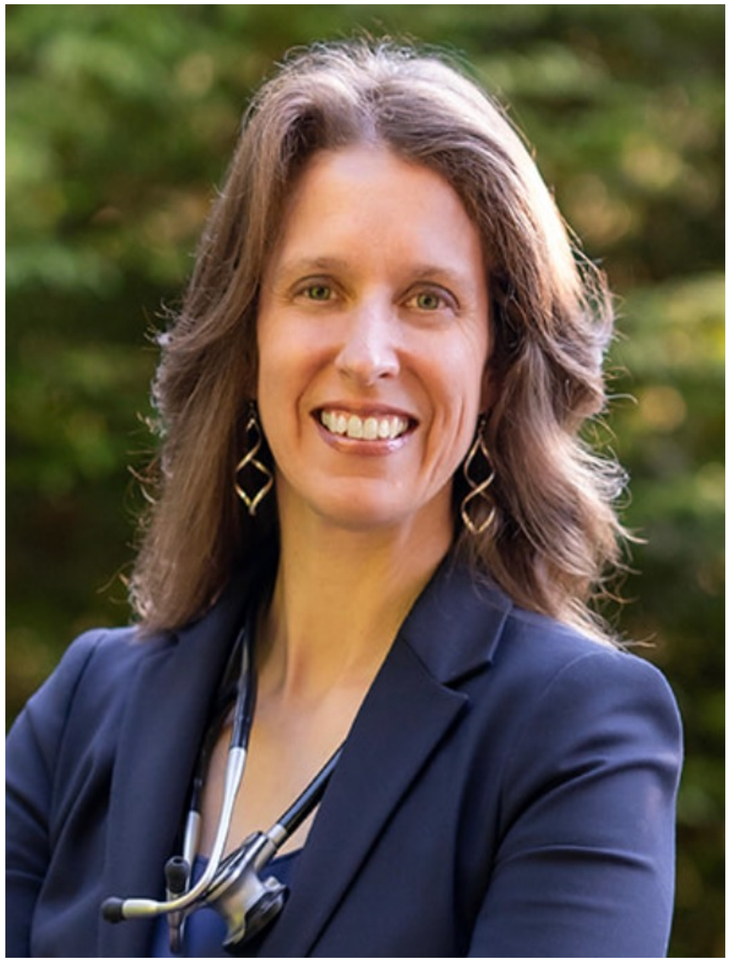
Picture by Robert Bynum

When you see these pictures, it means it's time for a mini break for questions or we're starting a new segment of the presentation!

Introduction: Dr. Jennifer Coomes, webinar presenter



- Doctor of Clinical Nutrition (DCN), Maryland University of Integrative Health (MUIH)

- MS, Applied Nutrition, University of Arizona
- MS, Biotechnology and Bioinformatics, Johns Hopkins University
- MS, Clinical Research Management, Arizona State University
- BA, Psychology, Depauw University

- Clinical Researcher and Experienced Yoga Instructor (E-RYT)

- A PTSD and abuse/trauma survivor who chose to overcome and educate the medical field and general public on prevention strategies to help more people find solutions and better health outcomes.

What will be covered?

SEGMENT 1 (around 20 minutes with brief questions from Chat)
What is PTSD and what needs to be considered for prevention strategies?

SEGMENT 2 (around 20 minutes with brief questions from Chat)
The Metabolic Breakdown of PTSD

SEGMENT 3 (around 20 minutes with brief questions from Chat)
Prevention Strategies for PTSD

SEGMENT 4
Q & A Discussion with panel and HATC closing of webinar

Be sure to put your questions into chat during the presentation for the brief segment transition, and then at the end, we'll tie up all questions with answers and resources. A copy of the presentation will also be available.

Recommended for Audience

Use Q & A to help with the following:

- **HATC moderators will manage the Q & A to answer any questions for provided documents and resources.**

- **Dr. Coomes will answer questions about healthcare content of the webinar. She will answer questions on the breaks, at the end, or as needed as if an immediate answer is needed.**

- **Use the provided power point (this one) to help you make notes of the presentation.**

- **Use the provided PTSD Screening Guidance to help you with notes and questions. You can use this for your practices, to help generate new referral flows for patients with PTSD to manage metabolic care, and for important points to consider in PTSD management.**

Important Reminders

- Information provided in this webinar is for educational purposes only.

- Please do not use this information to self diagnose or treat any medical condition. Please be sure to go to the appropriate health care provider for assessment, diagnosis, and treatment/care of your personal health case.

- The information provided in this webinar is evidence/research based and based on clinical cases and health outcomes. Every case of PTSD is different and needs personalized assessment to determine the unique mechanism of disease, obstacles to cure, and best therapies for comprehensive care to achieve resolution of symptoms.

- For questions and desires to improve PTSD and mental health comprehensive care where you are, please email drcoomes@essencehealthandresearch.com

Picture by Cynthia Oliveira

Segment #1:
What is PTSD and what needs to be considered for prevention strategies?

Who is most affected by Post Traumatic Stress Disorder (PTSD)?

- Previous history of physical, emotional, mental, sexual, or spiritual abuse and trauma
- Truly oppressed or undereducated individuals and groups <u>without enough means, knowledge, or access to get the right help and support</u>
- Family history of abuse and trauma
- Exposure to trauma second hand
- Veterans, healthcare providers, police officers
- Family members of those diagnosed with PTSD

Early Prevention Strategies to consider during this webinar

- PTSD has **pre-trauma, peri-trauma, and post trauma attributes** that need assessment and correct healthcare management to prevent life altering symptoms of PTSD and reduce risk of chronic PTSD.

- Not everyone who experiences trauma has PTSD, so **prevention** is increased with improved assessments at the peri-trauma stage and increased support.

- **Patients with PTSD need diagnoses quickly in peri-trauma and post trauma states as well as assessments of metabolic health** to improve health outcomes.

- Patients need a **comprehensive medical team** for PTSD care that may include PCPs, counselors, specialist physicians/doctors, dietitian/nutritionists, physical therapists, etc. The key is to recognize signs and be ready to refer as needed.

Why is better PTSD management important?

- PTSD is widespread. At least 5% of the US population experiences PTSD each year. This is roughly 21 Million people. (National Center for PTSD)
- PTSD generates work disruption and reduced productivity
- PTSD can degenerate physical, mental, emotional, and spiritual health
- PTSD can generate staggering medical care costs
- PTSD increased risk for chronic disease and addiction
- There is increased desire to rely on SSRIs that may not resolve all symptoms and metabolic problems.
- There is not enough knowledge and people well trained in both the psychological and metabolic components of PTSD to overcome the rising effects of this condition in today's times, and patients lose hope that it will ever get better.

What is Post Traumatic Stress Disorder (PTSD)?

Mann et al, 2024; Miranda et al, 2022, Coomes, 2021, LIhua et al, 2020, Mellon et al, 2018, Abou Ziki and Mani, 2016, Weiss et al, 2011

PTSD has a number of psychological, emotional, and physical symptoms that are debilitating and consistently detrimental to a person's health if not properly treated.

Currently the DSM-5 clinical presentation for diagnosing PTSD in an individual is based on a neuropsychiatric anxiety disorder classification

Key components of a diagnosis include:

- **A previous traumatic event or events (ie. a significant stressor) along with duration and severity of the symptoms of hyperarousal, intrusion, avoidance, and alterations in mood for 1 month or more that cause functional impairments and distress in life that cannot be attributed to other causes.**

What is Post Traumatic Stress Disorder (PTSD)?

Miranda et al, 2022, Coomes, 2021, LIhua et al, 2020, Mellon et al, 2018, Abou Ziki and Mani, 2016, Weiss et al, 2011

Key components of a diagnosis include (continued):

- **The traumatic event must be associated with a physical threat to one's life or someone close to them and can range from:**
  - **A one time catastrophic or serious event**
  - **A series of chronic traumatic events (ie. complex PTSD)**
  - **These events may include war, torture, natural disasters, crime, sexual violence, or significant pain.**

What is Post Traumatic Stress Disorder (PTSD)?

Miranda et al, 2022, Coomes, 2021, Llhua et al, 2020, Mellon et al, 2018, Abou Ziki and Mani, 2016, Weiss et al, 2011

Key components of a diagnosis include (continued):

- **Emotional experiences** of this trauma include:
    - Elements of extreme fear, helplessness, horror, desire to avoid anything that has to do with the trauma
    - Impaired memory recall of the trauma
    - Impaired concentration and focus
    - Nightmares, emotional numbness, detachment, suicidal thoughts, withdrawal from those close, hyperarousal states, startle responses, anxiety, phobias, hypervigilance, anger (with possible outbursts), irritability, insomnia, autonomic excitability

Types of PTSD

Type #1: Normal Stress Response (not PTSD)

- Typical stress response after trauma, injury, and illness that is not severe and is managed with at home care, counseling, and family/friend support. This is not diagnosed as PTSD. This is the first place where metabolic care can help prevent full blown PTSD in the peri and post trauma states.

Type #2: Acute Stress Disorder (not PTSD)

- This is typical after natural disasters, life threatening event, loss of a job, loved one, childbirth, etc. It can be treated by counseling, medications, metabolic healthcare, and other therapies. This is not diagnosed yet as PTSD, but if not treated, it will become PTSD.

Type #3: Uncomplicated PTSD

- This is diagnosable PTSD associated with one particular traumatic event that meets diagnostic criteria for PTSD. This diagnosis needs a comprehensive medical team for treatment and care.

Type #4: Complex PTSD

- This is diagnosable PTSD associated with numerous or prolonged traumatic events that meets diagnostic criteria for PTSD. This type is more intense and may have personality disorders and extreme emotions. This diagnosis needs a comprehensive medical team for treatment and care.

Type #5: Comorbid PTSD

- This is diagnosable PTSD alongside other co-morbid medical conditions. This diagnosis needs a comprehensive medical team for treatment and care.

The Leap from Psychological to Metabolic Components of PTSD

Schrader et Ross, 2021; National Center for PTSD, 2023 (Clinician's Guide to Medications for PTSD)

- The DSM-5 includes physical and metabolic symptoms in its neuropsychiatric classification of PTSD.

- Comprehensive assessments that include metabolic healthcare will improve health outcomes and prevent co-morbid diseases.

- Current established standard of care and trauma therapies for PTSD include:

  - Cognitive Behavior Therapy (CBT)
  - Cognitive Processing Therapy (CPT), a type of CBT
  - Prolonged Exposure Therapy (PE)
  - Eye Movement, Desensitization, & Restructuring (EMDR)
  - Medication Therapy: Paroxetine*, Sertraline*
    - * FDA Approved Selective Serotonin Uptake Inhibitors (SSRIs) for PTSD

PTSD Co-morbid Conditions→Metabolic Considerations

These are co-morbid conditions for PTSD, ie. they can increase risk for the condition or can exist along side this condition.

Pre-trauma conditions can increase the likelihood for a traumatized person to have PTSD.

Having PTSD can increase risk for these conditions.

- IBS
- Psoriasis
- Autoimmune Diseases
- Metabolic Syndrome
- Cardiovascular Disease
- Obesity
- Type 2 Diabetes
- Dyslipidemia
- Anxiety, Depression, HPA Axis dysfunction, Suicide
- Chronic Inflammation
- Substance Abuse
- Stomach ulcers
- Intestinal Permeability
- Dysbiosis of the Microbiome
- Dyspepsia, indigestion, GERD, Abdominal pain
- Hypothyroidism
- Cognitive Decline
- Migraines

Citations

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Menon et al, 2013
The Gut Reaction to PTSD—Gallipoli, 2017
Fadgyas-Stanculete et al, 2014
Savas et al, 2009
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PTSD: Pre, Peri, and Post Trauma Factors

Gandubert et al, 2016, Levine et al, 2014

- The likelihood of humans to experience trauma in their lifetimes is 50-90%. Of those, 30% develop PTSD. Of those with PTSD, 7-12% cannot resolve symptoms without further intervention.

- Pre-trauma, peri-trauma, and post-trauma factors influence the risk of having PTSD after a traumatic event.

- Pre-trauma events are called ”diathesis” → lower diathesis, reduced severity for experiencing PTSD

PTSD: Pre, Peri, and Post Trauma Factors

Gandubert et al, 2016, Levine et al, 2014

- Peri-trauma events associated with emotional distress and dissociation can override pre-trauma diathesis to increase risk for PTSD

- If there is increased sympathetic nervous system responses and reduced Hypothalamus Pituitary Adrenal (HPA) axis function in post-trauma, the risk for PTSD increases.

- PTSD can be acute or chronic and different treatment/care plans may be needed for both.

- Causes of PTSD can be epigenetic and root back to a mother's stressors of carrying fetus in the womb and lead to a hyperactive HPA axis for a child early in life.

Segment #2:
The Metabolic Component of PTSD

PTSD and Metabolic Syndrome

Miranda et al, 2022, Coomes, 2021, LIhua et al, 2020, Mellon et al, 2018, Abou Ziki and Mani, 2016, Weiss et al, 2011

- **Post Traumatic Stress Syndrome (PTSD) is highly associated with Metabolic Syndrome (MetS).**

- **PTSD can mimic MetS with its metabolic presentation.**

- **Metabolic Syndrome is a precursor to Diabetes.**

- **PTSD and MetS were both found to be associated with chronic metabolic acidosis, cortisol imbalances, hippocampus dysfunction, shifts in immune responses, micronutrient deficiencies, metabolic dysfunctions, and increased risk for infections, tumor development, cancer, and Alzheimer's Disease (AD).**

What is Metabolic Syndrome (MetS)?

Miranda et al, 2022, Coomes, 2021, LIhua et al, 2020, Mellon et al, 2018, Abou Ziki and Mani, 2016, Weiss et al, 2011

MetS includes diagnosis of a number of the following conditions:

- Hypertension
- Increased abdominal fat/obesity
- Elevated triglycerides
- Reduced HDL cholesterol
- Increased glucose dysregulation

The Metabolic Breakdown of PTSD

Anderson, 2016, Griffin et al, 2014

- There is a strong body of research that supports the reality that PTSD has a metabolic component that needs to be assessed. Not every patient has this component as strongly, but if a patient is not getting better, this may be the missing piece that is not being addressed.

- The next slides will help you understand this metabolic component that can look much like Metabolic Syndrome and Diabetes and produce gastrointestinal conditions, migraines, and more.

- Increased inflammation is a driving factor in PTSD, and it can generate neuroinflammation, blood sugar and cortisol dysregulation, sleep disturbances, gut imbalances, acid-base imbalances, and more.

- Reducing symptoms of PTSD requires comprehensive assessment of these metabolic components to truly help a patient move forward.

PTSD Key Relationships to Metabolic Care of PTSD

Pre-trauma inflammation → Increases risk of PTSD

PTSD → Increased risk of Metabolic Syndrome (MetS)

MetS → Increases risk of Diabetes

PTSD → Increased risk of Diabetes

PTSD → Increased risk of Chronic Inflammation

Chronic Inflammation → Increased Risk of Disease

PTSD → Increased risk of Autoimmune, Chronic, Metabolic Disease

Why do these relationships matter in PTSD management?

- Metabolic healthcare is not always thought to be connected to mental health management. In this case, PTSD symptoms are both psychological and physical. We need to link the two for best PTSD care.

- Stress hyperglycemia, high blood pressure, and high heart rates are often associated with trauma and it increases risk of mortality in traumatic events. If managed quickly, the brain and body can start to correctly process trauma and shift towards survival.

- PTSD management of metabolic components includes blood sugar, cortisol, cardiovascular, and acid-base regulation along with psychological management in peri-trauma stages.

PTSD & Inflammation

BIG TAKEAWAY:
Hyperactive Immune Responses

	BIOMARKERS	PTSD	MetS
INFLAMMATION	Homocysteine	INCREASED	INCREASED
	CRP	INCREASED	INCREASED
	IL-1β	INCREASED	INCREASED
	IL-4	BOTH	INCREASED
	IL-6	INCREASED	INCREASED
	IL-10	BOTH	INCREASED
	IL-12	INCREASED	INCREASED
	IL-17	INCREASED	INCREASED
	TNF-α	INCREASED	INCREASED
	TNF-β	BOTH	INCREASED
	INF-γ	INCREASED	INCREASED
	WBCs	INCREASED chronic/severe PTSD	INCREASED
	Neutrophil Lymphocyte Ratio (NLR)	INCREASED	INCREASED
	Th1	INCREASED DECREASED chronic PTSD	INCREASED
	Th2	INCREASED in shift from Th1 to Th2	DECREASED with insulin resistance INCREASED in adipose cells
	Th17	INCREASED	INCREASED
	T-regs	DECREASED	DECREASED
	Microbiome	↑ Dysbiosis	↑ Dysbiosis

Pro-Inflammatory Cytokines
IL-1β, IL-6, IL-12
IL-17, TNF-α

Anti-Inflammatory Cytokines
IL-4, IL-10, TNF-β

BOTH
IL-6

Th1 Cytokines (pro-inflammatory)
IL-1β, IL-12, IL-17,
INF-γ, TNF-α

Th2 Cytokines (anti-inflammatory)
IL-4, IL-10

Th17 Cytokines
IL-17

Citations
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Swart et al, 2021;
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PTSD & Immune Responses

Renner et al, 2022, Schreiber et al, 2021, Griffin et al, 2014

Traumatic events → ”Cytokine Storm” and “Caltecholamine Rush”

This emphasizes needs for effective care plans in acute traumatic events and acute PTSD.

Cytokine Storm:

- When the immune system responses more aggressively than it should.
- This increases the inflammatory responses and can increase risk of mortality, septic shock, acute respiratory distress syndrome (ARDS), and immunosuppression

Caltecholamine Rush:

- The body’s release of caltecholamines (adrenaline/epinephrine, norepinephrine) in response to stress, ie. the fight or flight response that activates the sympathetic nervous system.
- This will increase blood pressure, heart rate, blood sugar, cortisol, osteocalcin
- Increased stress increases insulin resistance typically found in Diabetes, Aging, Menopause, and Obesity

PTSD & Immune Responses

Renner et al, 2022, Schreiber et al, 2021, Griffin et al, 2014

PTSD ⟶ Th1 Shift to Th 2 Immune Responses

Th1 responses (adaptive immune system) help to reduce infection and tumor development.
Th 2 responses (humoral immune system) help in allergy conditions and parasite infections.

When one is high, the other one is typically reduced.

PTSD associated flashbacks to previous trauma suppresses the Th1 response due to increased cortisol, norepinephrine, and epinephrine spikes.

This shift from Th1 to Th2 immune responses increases chronic inflammation.
This happens because of chronic stress of traumatic events and PTSD.

↑ Th 2 Responses ⟶ ↑ Risk of Tumor development & Infections

This is <u>CONTROVERSIAL</u> and leaves room for further research.
Some studies indicate that Th2 cells and responses also help to increase tumor surveillance and reduce tumor sizes. Th2 response can BOTH induce tumor growth and reduction depending type and stage of tumor.

PTSD & Blood Sugar Regulation, Metabolism, Vitals, Body Composition, Acid-Base Balance

Citations

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Bryant et al, 2008;
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Shah et al, 2013
Shi et al, 2020;
Masodkar et al, 2016;
Arenson and Cohen, 2017

	BIOMARKERS	PTSD	MetS
BLOOD SUGAR REGULATION, METABOLISM, VITAALS, BODY COMPOSITION	Fasting Plasma Glucose	INCREASED	INCREASED
	HbA1c	INCREASED	INCREASED
	Total Cholesterol	INCREASED	INCREASED
	LDL-C	INCREASED	INCREASED
	HDL-C	DECREASED	DECREASED
	Triglycerides	INCREASED	INCREASED
	Blood Pressure	INCREASED	INCREASED
	Heart Rate	INCREASED	INCREASED
	Respiratory Rate	INCREASED	INCREASED
	Heart Rate Variability	DECREASED	DECREASED
	BMI	INCREASED	Normal to Obese higher mortality in normal and obese categories with MetS
	Waist Circumference	INCREASED	INCREASED
	Sodium	UNCLEAR	BOTH high intakes but also metabolic acidosis increases excretion
	Chloride	DECREASED	BOTH high intakes but also metabolic acidosis increases excretion
	Potassium	INCREASED	DECREASED
	Calcium	INCREASED based on coronary artery calcium (CAC)	DECREASED
	Anion Gap	INCREASED	INCREASED

PTSD & Hormones/Neurotransmitters

	BIOMARKERS	PTSD	MetS
HORMONES AND NEUROTRANSMITTERS	Leptin	INCREASED	BOTH
	Leptin Resistance	INCREASED	INCREASED
	BDNF	INCREASED	INCREASED
	Insulin	INCREASED	INCREASED in blood DECREASED in brain due to reduced insulin crossing BBB
	Insulin Resistance	INCREASED	INCREASED
	Cortisol	DECREASED chronic PTSD	INCREASED
	Norepinephrine	INCREASED	INCREASED
	Dopamine	DECREASED	DECREASED
	Serotonin	INCREASED when dopamine is low DECREASED With low platelet serotonin	DECREASED
	Glutamate	INCREASED	INCREASED
	GABA	DECREASED	DECREASED due to islet B cell inflammation
	TSH	INCREASED	INCREASED mostly but can be either
	Estrogen	DECREASED	DECREASED
	Testosterone	DECREASED	DECREASED

Citations

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Insulin & Leptin

- Increased insulin → Leptin resistance
- Leptin regulates appetite, blood cell formation, & T-cell activation
- Insulin resistance can reduce T-cell activation increasing infection.
- Leptin reduces fear responses.

BDNF

- Can increase insulin resistance and cognitive dysfunction

Dopamine

- Low dopamine in PTSD is associated with intrusive thoughts, avoidance behaviors, negative thoughts, hyperarousal

Serotonin

- Platelets store and release serotonin upon activation.
- PTSD is associated with low platelet serotonin.
- Higher platelet activation is associated with acute stress & increased risk of cardiovascular disease.
- Normal serotonin invites happiness and collaboration. Low serotonin is suicidal, aggressive, and dark.

Estrogen

- PTSD symptoms are increased when estrogen is low

PTSD & Cortisol Relationships

Griffin et al, 2014, DiNicolantonio and O'Keefe, 2021

Acute PTSD ⟶ ↑ Cortisol, Norepinephrine, Epinephrine

Chronic PTSD ⟶ ↓ Cortisol

This is due to a hyperactive HPA axis. This will depress the cortisol response in chronic stress/PTSD.

↑ Cortisol ⟶ Insulin resistance

Metabolic Acidosis ⟶ ↑ Cortisol ⟶ Blood pH shift

H+ shifts out of plasma, potassium deficiency in cells
Higher acidic loads lead to higher levels of cortisol in blood and urine.

Chronic metabolic acidosis → ↑ Cortisol

Metabolic Acidosis ⟶ Mineral depletion ⟶ Acid-base imbalances

↑ Cortisol ⟶ ↑ Hippocampus Dysfunction & Atrophy ⟶ PTSD & AD

PTSD & Gene/SNP Relationships

Citations
Nievergelt et al, 2019
Abou Ziki and Mani, 2016
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Rana et al, 2019
Cornelis et al, 2012
Mir et al, 2018
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PTSD Genes/SNPs	MetS Genes/SNPs
PARK2 Gene is associated with Parkinson's disease, mitochondrial dysfunction, degeneration of dopaminergic neurons, reduced dopamine	**PARK2**
BDNF, rs6265 increases risk of PTSD in cancer	**BDNF, rs6265** increases risk of MetS
COMT, rs4680	**COMT, rs4680** associated with panic disorders and CVD
MTHFR C677T, rs1801133 increases risk for MDD after childhood trauma and is also associated with reduced oxidative stress defense	**MTHFR C677T, rs1801133** increases risk for obesity and high homocysteine levels

Segment #3:
Prevention Strategies for PTSD

Where PTSD Management Starts

- With the medical history
- At the trauma site
- At the hospital or doctor's office with the PCP, so correct referrals are very important
- With a trained counselor
- With specialist doctors, dietitian/nutritionists, physical therapists, etc.
- At home

Pre-Trauma Screening

- This screening with trauma and abuse victims is usually done post trauma.

- This is information gathering about a patient's life before the traumatic event to understand who the person was before the event to compare to trauma circumstances and conditions, ie. Is this person at high risk for diagnosed or chronic PTSD?

- This information is the **"diathesis"** for pre-trauma risk for PTSD

- The higher the level of genetic predisposition, pre-trauma stress, inflammatory medical conditions (most chronic, autoimmune, and mental health conditions), bad diet, addictions, lack of exercise, and lifestyle imbalances, the higher the risk of fully manifested or chronic PTSD.

Peri-Trauma Screening (Early Comprehensive Care HERE reduces PTSD risk)

- This type of screening is usually done at the trauma site or just after the trauma, ie. accident site, at the hospital after a sexual assault, etc. Key elements will include psychological and physical state, vitals, blood glucose, hydration/electrolyte status, nutrient status, pain states, key information about traumatic event, and any evidence off the body needed before a patient takes a shower.

- Often, if trauma is serious/severe, emergency personnel have precedence over medical care and life saving measures are priority.

- If someone is not assessed at the time of the trauma or just after, the assessment can be done later by having the patient go back to the experience and talk about the experience depending on readiness. Comparison of pre-trauma information to the peri-trauma experience will help determine likelihood of PTSD.

- **Key Prevention Awareness:** Encourage anyone who has had any type of trauma/abuse to come forward to someone they trust to assess both psychological and physical/metabolic health to help reduce risk of chronic disease due to unprocessed trauma.

Post-Trauma Screening

What to consider in treatment and care plans for PTSD management:

- Residual physical injury
- Serious mental and emotional health imbalances
- Serious nervous system imbalances
- Sleep disturbances
- Neuroinflammation, headaches, migraines
- Blood sugar dysregulation
- Pain dysregulation
- Cortisol and stress response dysregulation
- Neurotransmitter dysregulation
- Hormone dysregulation
- Acid-base imbalances
- Gut imbalances (microbiome, leaky gut, IBS, inflammation, etc)
- Digestive disturbances
- Weight imbalances (both obesity and malnourishment will pose risk)
- Dietary imbalances that will perpetuate symptoms
- Emotional eating and addiction susceptibility for pain or symptom management
- Exercise imbalances
- Lack of correct nutrients/supplementation
- Night time diet and evening routine imbalances that will disrupt sleep
- Women and men in their 40's and beyond are going to have hormone imbalances (unless managed with HRT) that will affect fear responses and will be at more risk for metabolic diseases. This can increase the risk for PTSD and co-morbid conditions.

The Comprehensive Medical Team for PTSD Management

- Emergency Health Care Providers (Paramedics, EMTs, Firefighters, Police Officers)
- Primary Care Physicians (MDs, DOs, NDs)
- Nurse Practitioners, Nurses, Physician Assistants
- Neurologists
- Psychiatrists, Counselors
- Doctors of Clinical Nutrition (DCNs), Registered Dietitians, Nutritionists
- Physical Therapists
- Cardiologists
- Endocrinologists
- Gastroenterologists
- Colorectal Physicians
- Chiropractors
- Clergy
- and more…

Metabolic Healthcare for PTSD

- Looking at mental health from a metabolic perspective is still a new concept.
- Metabolic healthcare is the key component missing from any mental health cases involving PTSD, depression, and anxiety.
- This webinar serves as the foundation to help many more healthcare providers and community members understand how important it is that we collaborate to provide more comprehensive care.
- Doctors of Clinical Nutrition (DCNs), Certified or Registered Dietitians (CDs or RDs), or Nutritionists who are trained in metabolic health for mental health conditions are great referral sources for PCPs, specialist doctors, counselors, psychiatrists, emergency personnel, and the community members who need help in improving health outcomes in PTSD and trauma/abuse cases.
- Let's learn more about metabolic/nutritional therapies for PTSD.

PTSD Symptom Reduction: Blood Sugar & Cortisol Management

Key Change	Details
Restructure dinner and after dinner routines to improve sleep and brain health.	• Softer foods overall in peri trauma or just post trauma to reduce heavy impacts on digestion • More modified Keto combinations of lean meats, non-starchy alkaline vegetables, Omega 3s, hydration and electrolytes. • No red meats, desserts, alcohol. • Highly reduced portions of starchy carbs unless hypoglycemic. • No after dinner snacking unless hypoglycemic—this will increase both blood sugar and cortisol.
After Dinner Exercise	• Gentle yoga and vagus nerve exercises help to calm cortisol and the enteric nervous system at night while also stabilizing blood sugar before sleep.
Blood Glucose Regulation (testing)	• Check post-prandial (after eating) and bedtime glucose to check for good glucose regulation. • Higher glucose readings will affect cortisol regulation, weight management, and sleep.
Urine testing for acid-base balance	• Urine testing helps to regulate urine pH which can help to give signs for metabolic acidosis at night which increases cortisol and affects sleep.

PTSD & Nutritional & Lifestyle Interventions

Citations

Alkaline Diet
Carnuba et al, 2017;
Souto et al, 2011;
Michopoulos et al, 2016

Multi-mineral supplement
König et al., 2009

Hydration
Costa-Vieira et al, 2019

Vitamin B1
Dhir et al, 2019

INTERVENTION	RESULTS
Alkaline Diet Helps to shift metabolic Acidosis often seen in peri-trauma and PTSD activation **THINK** Vitamin B1 Electrolytes Minerals Hydration Alkaline foods	• Eating a diet rich in acid producing foods produces a chronic low grade state of metabolic acidosis which shows up in blood and urine, increasing risk for metabolic disease such as T2D, which is a high risk factor of PTSD. PTSD mimics metabolic syndrome. Alkaline foods help to reduce this risk. • **Multi-mineral supplement** [with Potassium (600mg), Calcium (500mg), Magnesium (200mg), Sodium (200mg), Copper (1mg), Zinc (5mg), Iron (5 mg), Chromium (60 μg), Molybdenum (80 μg), Selenium (30 μg)] → Significant improvements in both blood and urine pH resulted from intake of a full spectrum alkaline multimineral supplement twice a day with no major changes in diet. This would help improve metabolic and urine acidosis concerns with metabolic syndrome, diabetes, and PTSD. • **Vitamin B1**: Thiamine is a critical vitamin involved in glucose metabolism, brain and mitochondrial function, and psychological stability. Deficiency is related to both lactic acidosis and metabolic acidosis conditions associated with metabolic disorders and could be deficient in those with PTSD • **Hydration**: Increased mineral water intake was shown to have beneficial effects on blood pressure, triglycerides, glucose, and HDL cholesterol which can have a beneficial effect in reducing the acidic state produced in metabolic syndrome

PTSD & Nutrition & Lifestyle Interventions

Citations

Low FODMAP Diet
Algera et al, 2019; Staudacher and Whelan, 2016

Digestive enzymes
Resnick, 2010

Probiotics
Lui, 2017

Vitamin A
Farre et al, 2020

Vitamin D
Khayyat and Attar, 2015; Farre et al, 2020

Zinc
Skalny et al, 2021

INTERVENTION	RESULTS
Gut & Enteric Nervous System Healing Helps to reduce gut inflammation associated with PTSD **THINK:** Reduce inflammatory aggravating foods that can irritate gut and enteric nervous system.	•Reduction of short chain fermentable carbohydrates through a low FODMAP diet helps to improve inflammatory symptoms in IBS. The low FODMAP diet REDUCES Bifidobacterium bacteria, so dosing of this probiotic species will need to be at a higher dose if this diet is prescribed for PTSD- IBS patients. •**Vitamin A:** Vitamin A helps to improve intestinal lining integrity while reducing CRP levels •**Vitamin D:** Vitamin D deficiency is found in those with IBS and supplementation is recommended based on levels from Serum Vitamin D testing. Vitamin D helps to improve intestinal lining integrity while reducing CRP levels. Vitamin D is recommended at 2000 IU/day/minimum. •**Zinc:** Zinc helps to restore gut mucosa and microbiome diversity •**Digestive Enzymes:** Digestive enzymes will help with macronutrient absorption while also reducing intestinal permeability to enable better vitamin and mineral absorption. •**Probiotics:** Increase of Bifidobacterium bacteria (spp, longus, animalis subsp Lactis) and Lactobacillus (spp, helveticus) probiotic species to help modulate PTSD symptoms and reduce dysbiosis.

PTSD & Nutrition & Lifestyle Interventions

Citations

Gluten free diet
Pietrzak et al, 2017

Neuroinflammation
Coomes and McGuirk, 2022

Magnesium L Threonate
Mickley et al, 2013;
Albumaria et al, 2011

CoQ10
Zozina et al, 2018
Raizner, 2019
Dludla et al, 2020

Vitamin B6
Stachowicz and Lebiedzinska, 2016

Protein
Stachowicz and Lebiedzinska, 2016

Omega 3s
Alquraan et al, 2019

Vitamin B12
McKee et al, 2018
Stover et al, 2017

Vitamin C
Vasefi et al, 2019

Folate
McKee et al, 2018
Stover et al, 2017
Nakamura et al, 2016
Higdon et al, 2007

Cruciferous vegetables
Hodges and Minich, 2015;
Nakamura et al, 2016;
Alabdali et al, 2014;
Higdon et al, 2007

Resveratrol
Weiskirchen and Weiskirchen, 2016
Hodges and Minich, 2015
Alabdali et al, 2014

INTERVENTION	RESULTS
Neuroinflammation and Detoxification **Helps to reduce inflammation in the brain while detoxing the body.** **THINK:** Reduce gluten and glutamate while increasing B vitamins, Vitamin C, Magnesium L Threonate, CoQ10, Omega 3 fatty acids, protein, and cruciferous vegetables.	• **Reduce Glutamate containing foods** due to increased neurotoxicity • **Gluten Free Diet (also contains glutamate):** Gluten free diet helps to reduce symptoms of psoriasis and increased intestinal permeability associated with PTSD • **Vitamin B6:** Needed to help form GABA. GABA increases cortisol, which is helpful for those with low cortisol in PTSD • **Vitamin B12:** This nutrient supports a strong blood brain barrier and good one (1) carbon metabolism. Vitamin B12 is a methyl donor nutrient. • **Vitamin C:** Vitamin C can help reduce neuroinflammation. • **Folate:** This nutrient supports a strong blood brain barrier and good one (1) carbon metabolism. Folate is a methyl donor nutrient. • **Magnesium L Threonate:** Magnesium L Threonate (MgT) has enhanced ability to improve fear extinction in the brain. • **CoQ10:** CoQ10 is cardioprotective and can help reduce hyperlipidemia in diabetic patients. This can be helpful with PTSD patients since they are at a higher risk for both metabolic syndrome and diabetes. • **Omega 3 Fatty Acids:** Omega 3 fatty acids were attributed to reducing memory impairment in response to PTSD stressors in a rat model. • **Dietary Protein:** Helps to normalize cortisol levels, especially after exercise • **Cruciferous vegetables:** Cruciferous vegetables helps to repair detoxification pathways to help reduce neuroinflammation. • **Resveratrol:** Resveratrol helps to repair detoxification pathways to help reduce neuroinflammation.

PTSD & Nutrition & Lifestyle Interventions

INTERVENTION	RESULTS
Other Nutrients	• **Vitamin E, Tocotrienols:** Vitamin E is protective against hypercholesterolemia and cardiovascular disease while also serving as an antioxidant. This vitamin can be helpful to reduce risk of comorbid conditions associated with PTSD. • **Hibiscus:** Hibiscus sabdariffa (sour tea) has had beneficial effects in reducing blood pressure and normalizing cholesterol and triglycerides with those diagnosed with diabetes and metabolic syndrome. Given that PTSD mimics metabolic syndrome, this herb would be beneficial for cardiovascular related symptoms. • **Cannabis (THC):** The endocannabinoid system is activated in PTSD where THC, the psychoactive ingredient of cannabis, has been shown to help modulate PTSD symptoms.
Therapies and Lifestyle	• **Physical Therapy:** PTSD is associated with increased risk for chronic pain. Physical therapy techniques combined with Cognitive Behavior Therapy (CBT) can help patient unlearn pain cycles and rebuild nervous system responses to fear and pain. • **Exercise:** Helps to increase and normalize cortisol (helpful for those with PTSD with low cortisol) • **Yoga (Active or Restorative Yoga):** Yoga helps to modulate blood pressure and heart rates into normal levels while also reducing anxiety often found in PTSD

Citations

Vitamin E
Musa, 2021; Catagol and Ozer, 2012

Hibiscus
Hudson, 2011

Cannabis
Mayo et al, 2022

Physical Therapy
Sueki et al, 2014

Exercise
Stachowicz and Lebiedzinska, 2016
Hegberg et al., 2019

Yoga
Coomes et al, 2021

FINAL TAKEAWAY

"The mimicking effect of the PTSD and MetS metabolic picture emphasizes the dire need to include the metabolic elements and symptoms of PTSD in its DSM-V definition and standard of care treatments to help broaden the scope of healthcare providers who need to be involved in medical care.

The seriousness of this condition and the wide prevalence of this condition on a global level with the limitation of approved treatments is no doubt due to overlooking these very profound metabolic relationships and resulting co-morbidities."

For more information

You can reach to Dr. Jennifer Coomes at
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for more information!

Thank you!

Questions & Access to Webinar materials

- Webinar Presentation
- PTSD Screening Guidance
- Reference List