
Mast Cells,
Autoimmune Disorders
& Comorbidity
© RP O'Brien

About Me:

Roselle P. O'Brien,

LMHC, REAT, REACE, ICAT, LPN

Education:

- MA in Clinical Mental Health Counseling
- MA in Education
- MFA in Creative Writing
- BA in Art/Fine Arts, Education
- Diploma Nursing

Licenses/Certification:

- Licensed Mental Health Counselor (LMHC)
- Licensed Clinical Mental Health Counselor (LCMHC)
- Licensed Nurse
- Licensed Educator
- Intermodal Creative Arts Therapist (ICAT)
- Intermodal Creative Arts Facilitator (ICAF)

About Me: (cont'd)

Licenses/Certification (cont'd):

- Registered Expressive Arts Therapist (REAT)
- Registered Expressive Arts Consultant/Educator (REACE)
- Certified Life Coach
- Certified Health & Nutrition Life Coach
- Certified Therapeutic Arts Life Coach

Certificates:

- Eco-Health Support: Medical Professional
- Eco-Health Support: Therapist

The Eco-Health Certificate Programs are for understanding and working with people who have Mast Cell Disorders (MCD) such as Mast Cell Activation Syndrome (MCAS), Post-/Long-COVID, being sensitive to multiple chemicals, chronic fatigue, brainfog, EDS, fibromyalgia, and more.

For more information: https://celacareonline.us

The Work I Do:

Roselle P. O'Brien,
LMHC, REAT, REACE, ICAT, LPN

Health & Wellness – Therapy – Life Coach
Creative Arts for Health & Healing – Supporting you!

I am a mast cell specialist with over 13 years of experience working with and supporting individuals with MCAS and other mast cell activation related issues and disorders. Visit the website and learn more:

CELACare Eco-Health, Inc.

https://celacareonline.us

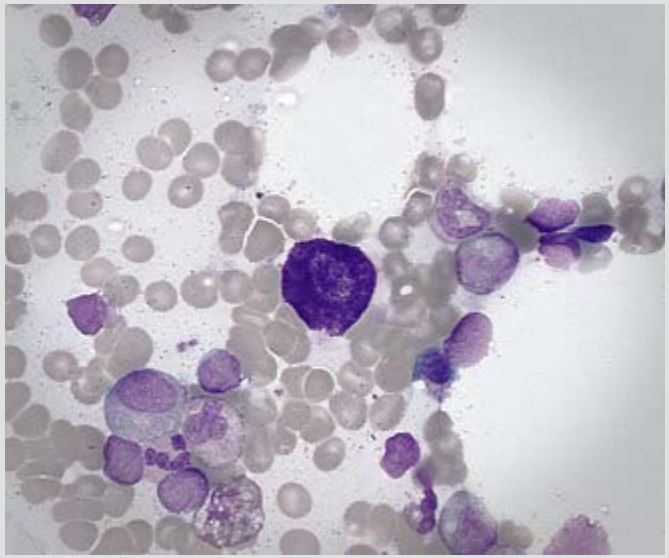
RoadMap

- Laying the Foundation
- Medical Model & Continuum of Care
- Immune & Autoimmune Systems
- Autoimmune Disorders
- Understanding Comorbidity
- Mast Cell Aware Supports & Strategies

Mast Cells

Mast cells are:

- White blood cells
- Located in the connective tissue throughout the entire body
- In every organ system including the brain
- Part of the body's immune response
- Part of the body's inflammatory response
- The body's 1st responders to perceived dangers and threats



Mast Cells

Mast cells – what they do:

- **Body's 1st line of defense** against viruses, bacteria, foreign substances, pathogens (our immune response)
- **Help protect** the body against things like bacteria, viruses—it "adapts" to the specific danger it encounters (adaptive immune response)
- **Regulate** blood pressure and heart function
- **Regulate** wound healing
- **Regulate** the body's inflammatory response
- **Regulate** most hormones in the GI tract influencing weight gain and loss
- **Directly activate** pain nerve fibers; induce pain; headache; chronic pain
- **& More**

Mast Cells

Mast cell activation in 4 steps:

Step 1: Activation
The mast cells have encountered a perceived threat or possible danger. They're sensitized then—bang!—they're activated;

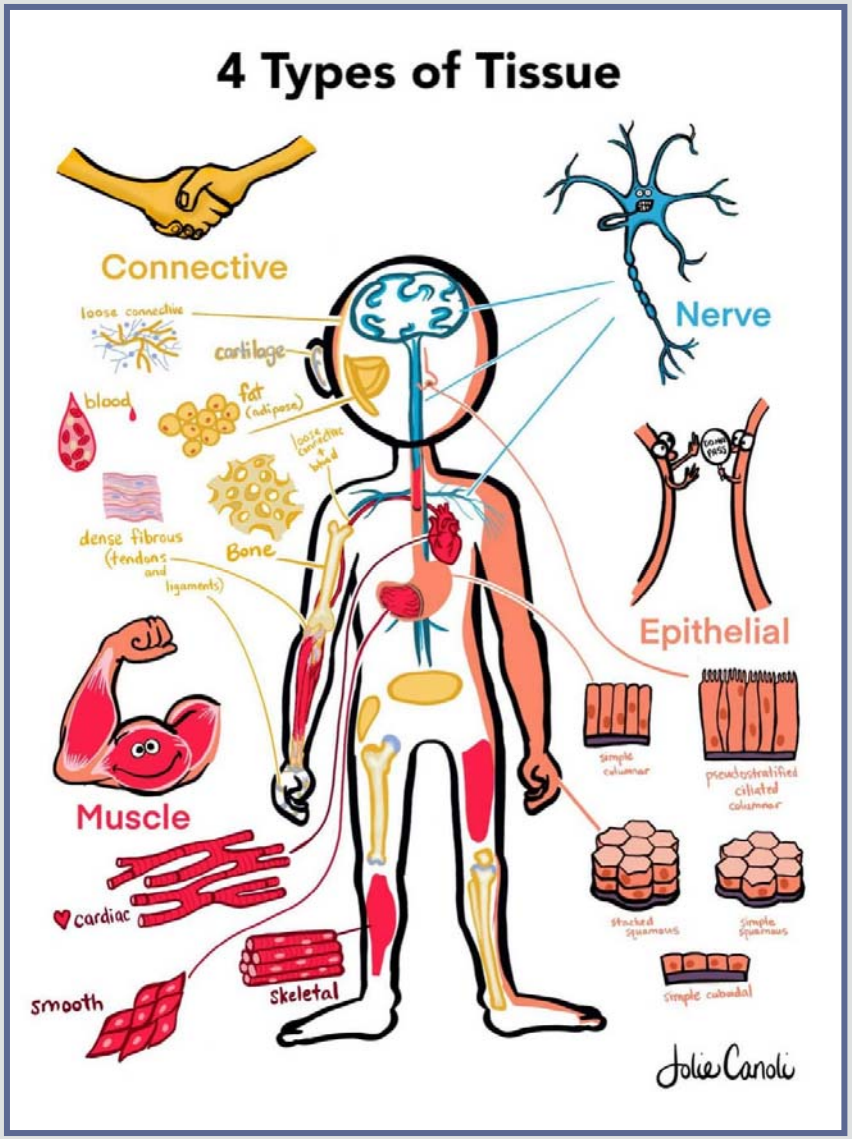
Step 2: Degranulate
The activated mast cells degranulate, they crumble;

Step 3: Mediators
The degranulating mast cells pump out hundred of mediators (chemicals) into the body. These mediators flood the body;

Step 4: Receptors
When mast cell-specific mediators hit their mast cell receptors ("doors") those substances get in and interact with the body.


"Everything is interconnected"
--- Thich Nhat Hanh

Tissues of the Body



Tissues of the Body

In our body, “tissue” is a group of cells that share general functions and, together, they form organs and other body parts.

There are four different types of body tissues:

Epithelial tissue

Nervous tissue

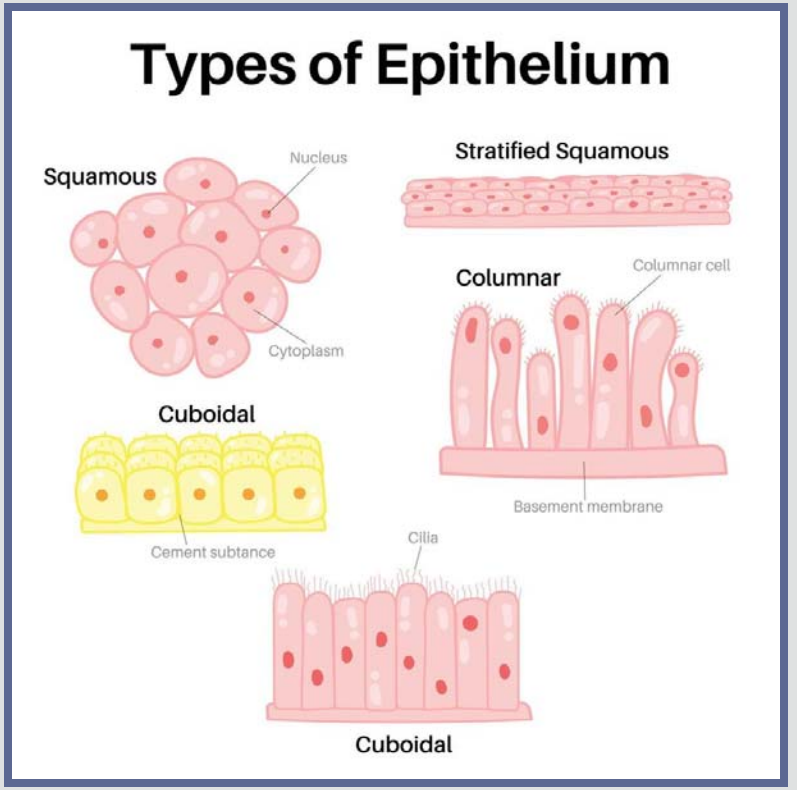
Muscle tissue

Connective tissue

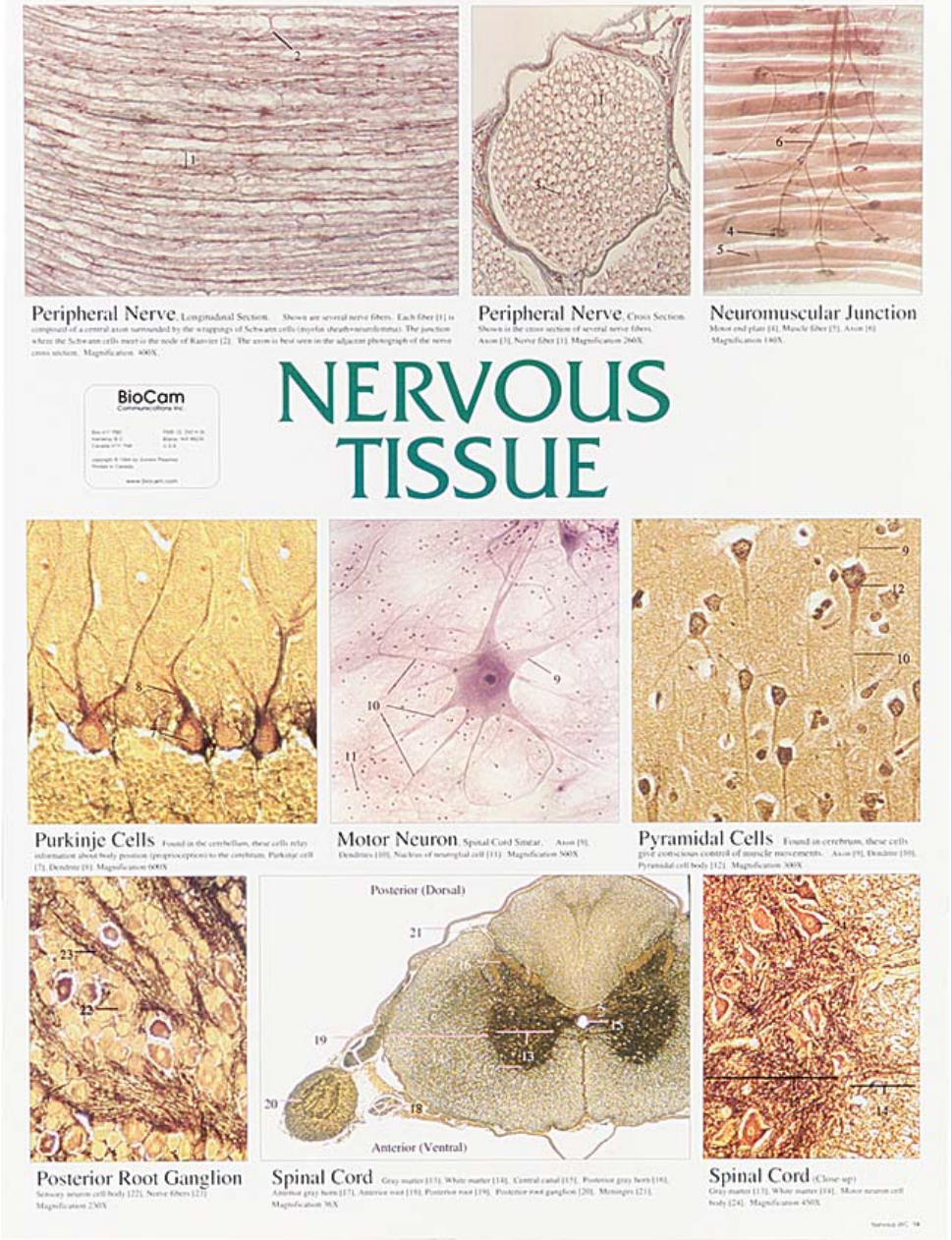
Tissues of the Body: Epithelial

Epithelial – a type of body tissue made up of sheets of cells bound tightly together that forms the covering on all internal and external surfaces of the body, lines body cavities and hollow organs, and is the major tissue in glands.

Epithelial and connective tissues work together to maintain the structure and function of organs within the body. Epithelial tissues line internal surfaces and cover the external surface of the body, while connective tissues provide support and protection, and facilitate the transport of substances throughout the body.

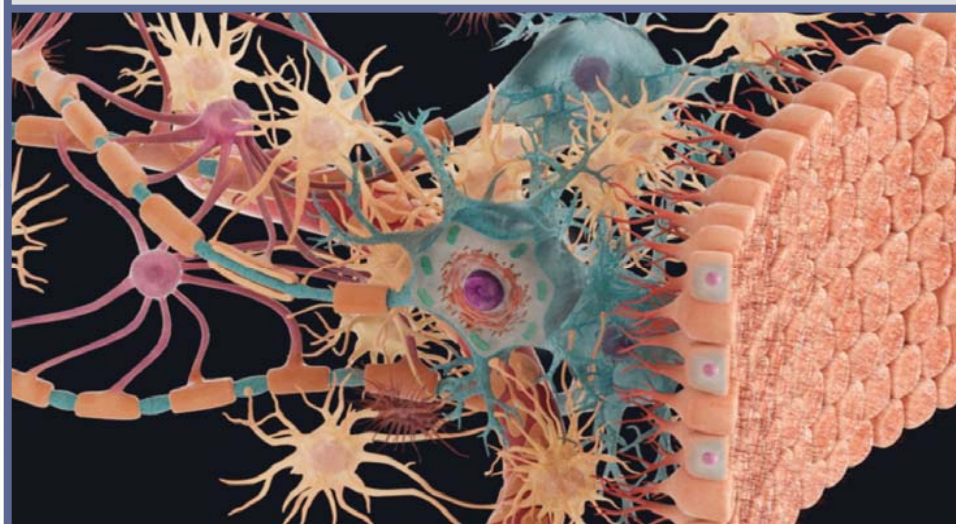


Tissues of the Body: Nervous



Nervous tissue – nervous tissue is specialized tissue that makes up three major parts of the nervous system: the nerves, the spinal cord, the brain. It is responsible for receiving, sending, and processing the constant stream of sensory input that we encounter.

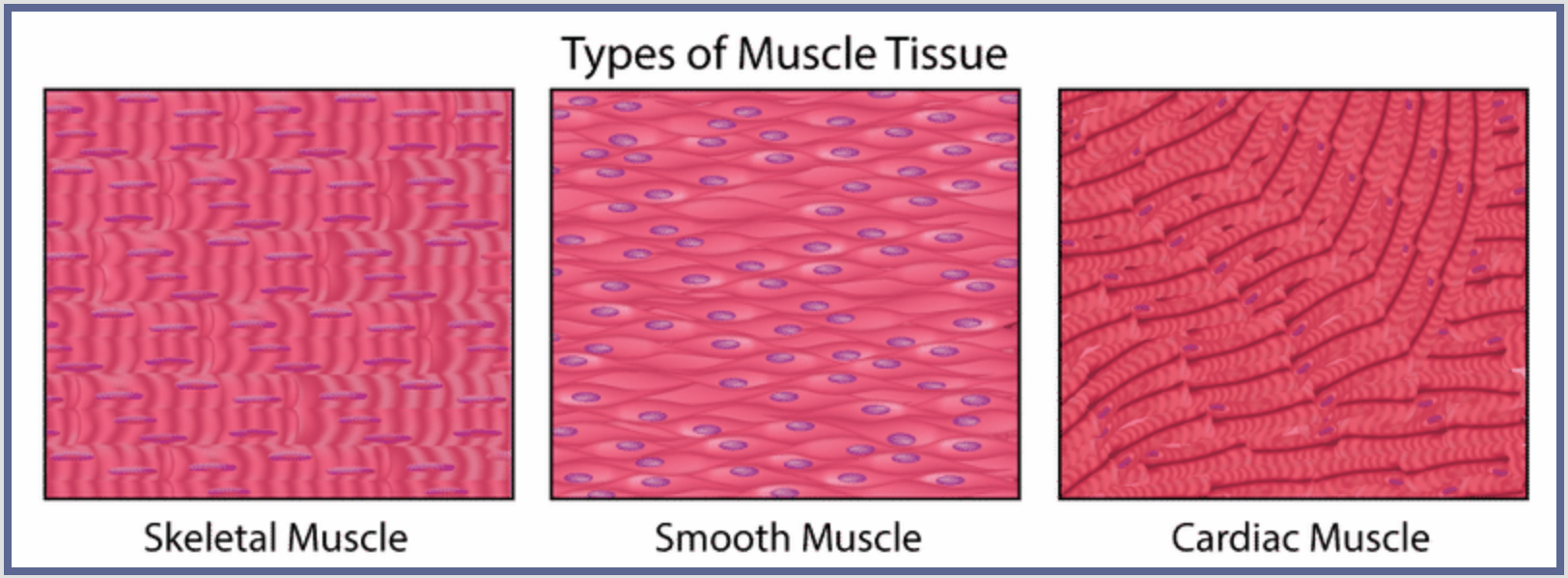
Mast cells have a significant relationship with nervous tissue as they are involved in both physiological and pathological interactions with the nervous system. They interact, communicate, and affect cell behaviors, bi-directionally.



Tissues of the Body: Muscle

Muscle tissue – muscles are pieces of soft tissue throughout the body. Each muscle is surrounded by a dense layer of connective tissue that provides overall support and protection. Muscle cells are long and slender so they are sometimes called muscle fibers.

Mast cells have a complex relationship with muscle tissue and they are present in both skeletal and other types of muscle. Each individual muscle fiber is encased in connective tissue that contains capillaries and nerve fibers. The muscle fibers are usually arranged in bundles or layers. Each bundle (or layer) is surrounded by connective tissue.



Tissues of the Body

Epithelial, nervous, and muscle tissues all have vital and key working relationships with our body's **connective tissues**.

Tissues of the Body: Connective

Connective tissues contribute to numerous body functions:

- Support organs and cells
- Transport nutrients and wastes
- Defend against pathogens
- Store fat
- Repair damaged tissues

Connective tissues form the vital connections, supports, and links that our body systems need to work together.

Connective tissues are literally what hold the body together.

Connective tissues take many forms, some of which aren't obvious at first. This means it also does some jobs you might not expect.

Connective tissue is the catchall term used for tissues that hold your body together and link its different parts. Connective tissue is essential to maintain the structure of the body. There are different forms of connective tissue nearly everywhere in your body.

Tissues of the Body: Connective

Connective tissues – main purposes:

- **Attaching** - connective tissues like *ligaments and tendons* can anchor parts in place
- **Cushioning** – *cartilage in joints* helps absorb impact and keeps bones from grinding together. Fatty tissue can also absorb impact and movement forces so they don't harm more delicate structures
- **Flexing** – *elastic connective tissues* are stretchy or can twist and bend. That helps the body to move around and limits injuries from impacts or movement forces
- **Protecting** – some connective tissues *carry and distribute immune cells*. And bones provide armor-like physical protection to the brain and vital organs in the chest
- **Separating** – the *capsule layer* around many of organs of the body provides a boundary separates them from surrounding tissue
- **Supplying** – some connective tissues *carry and distribute oxygen and other nutrients* to various tissues

Tissues of the Body: Connective

Remember the 4 main types of body tissue:

- Epithelial tissue
- Nervous tissue
- Muscle tissue
- Connective tissue

All of the organs and systems of the body are made up of these tissues.

When most people talk about connective tissue, they're typically talking about tissues like joints and tendons. But connective tissue can describe other structures in your body, as well.

Tissues of the Body: Connective

Things we don't think of as tissue or as connective tissue:

Bones
We tend to not think of bones as tissue, but bones are made of hard, strong tissue that gives the body its shape and helps us move. Bones are made out of specialized connective tissue.

Blood
Technically, blood is a fluid connective tissue. Blood links nearly all parts of the body in some way, which means it counts as a connective tissue.

Cartilage
Cartilage is a key connective tissue. It is essential for linking and supporting key parts throughout the body.

Ligaments & Tendons
These are both connective tissues. Ligaments link bones to bones and help stabilize joints. Tendons link muscles to bones.

Sclera
The white of the eye is a type of dense, fibrous connective tissue (that is continuous with the connective tissue of the cornea.)

Connective Tissue Conditions & Disorders

Things we know:

Different connective tissue diseases can cause a wide variety of different symptoms.

Connective tissue diseases can broadly affect multiple connective tissues or tissue types. Most connective tissue diseases can cause symptoms all over the body. Musculoskeletal pain, weakness, and/or stiffness are common as are systemic symptoms like fatigue.

The lungs have a lot of connective tissues and rely heavily on them. Blood vessels run through most of the body's connective tissues, and because they're made of similar stuff, inflammation spreads easily between them.

As a result, many connective tissue diseases can cause musculoskeletal symptoms together with cardiopulmonary symptoms, like shortness of breath and blood pressure or heartbeat changes. If blood vessels become inflamed, they can swell and break, causing unexplained bleeding.

Mast cells are found in the connective tissues throughout the body.

Connective Tissue Conditions & Disorders

More things we know:

Connective tissue disorders/diseases/conditions include:

- Ehlers-Danlos Syndrome
- Osteoporosis
- Blood clotting disorders
- Osteoarthritis
- Rheumatoid arthritis
- Inflammation (for example, tendonitis)
- Eczema

Mast cell activation related disorders/diseases/conditions include:

- Ehlers-Danlos Syndrome
- Osteoporosis
- Blood clotting disorders
- Osteoarthritis
- Rheumatoid arthritis
- Inflammation (for example, tendonitis)
- Eczema

Mast Cells are Everywhere

Mast cells are in the body's connective tissue. Mast cells are everywhere.

The Lenses of Medicine

Medical Model & Medical Approach

Medical model – refers to the framework—the lens—through which health and illness are viewed. Typically this is a biomedical lens that focuses on diagnosing and treating diseases based on the biological and physiological factors.

Medical approach – refers to the strategies that are used by healthcare professionals to diagnose and medically treat their patients. It's about how services are delivered.

The medical *model* is the theoretical framing and foundation. It's the lens through which health and illness are viewed and understood.

The medical *approach* is how the healthcare professional goes about applying their skills, techniques, and training in the care of their patients; the delivery of services.

Types of Medical Approaches

Primary Care – healthcare provided by a physician who typically is the first contact for a person's healthcare needs. The primary care provider or primary care physician (PCP) coordinates any additional care a person may need (e.g., referrals to specialists.)

Integrative Care – an approach to providing healthcare in which the patient has an active role in their care. Integrative medical practitioners focus on the patient and not the disease and apply a broader approach to healing. It includes traditional medicine, complimentary medicine, and alternative medicine approaches.

Complimentary Care – traditional medicine approaches that are used together with non-traditional medicine approaches, in a coordinated way.

Alternative Care – a non-mainstream practice or approach used in place of traditional approaches or conventional medicine approaches.

Holistic Care – an approach to healthcare that addresses the whole person--physical, emotional, cognitive, social, and spiritual—that is not compartmentalized or focused primarily on the disease.

Palliative Care – non-curative approach that focuses on improving a person's quality of life.

Medical Models: Managed Care

Managed Care – a medical model designed to reduce the cost of care while trying to maintain the quality of care. It specifically involves managed care plans. Managed care plans are a type of health insurance that restricts choices for the person/patient to lower costs for the insurance company (with more flexible plans typically costing the individual more and having a higher premium.)

Managed care organizations (MCOs) are entities that are integrated into the healthcare system. Their aim is to reduce how much is spent on healthcare by using strategies such as preventative medicine and providing treatment guidelines. MCOs are often contracted with by government agencies to administer health and healthcare programs with the MCOs responsible for setting up what are and are not covered healthcare benefits.

Managed care plans manage the care of the person/patient to limit costs while trying to maintain quality of care. The managing of each person's health is done by healthcare professionals and organizations as the primary decision-makers, not the individual.

Medical Models: Continuum of Care

Continuum of Care – a managed care medical model that refers to the coordinated progression of care for patients. This includes preventative care, medical treatments should a person be having a medical incident, rehab, and ongoing health maintenance. It is not merely a type of managed care. It is a lens through which health and healthcare can be viewed and also predicted.

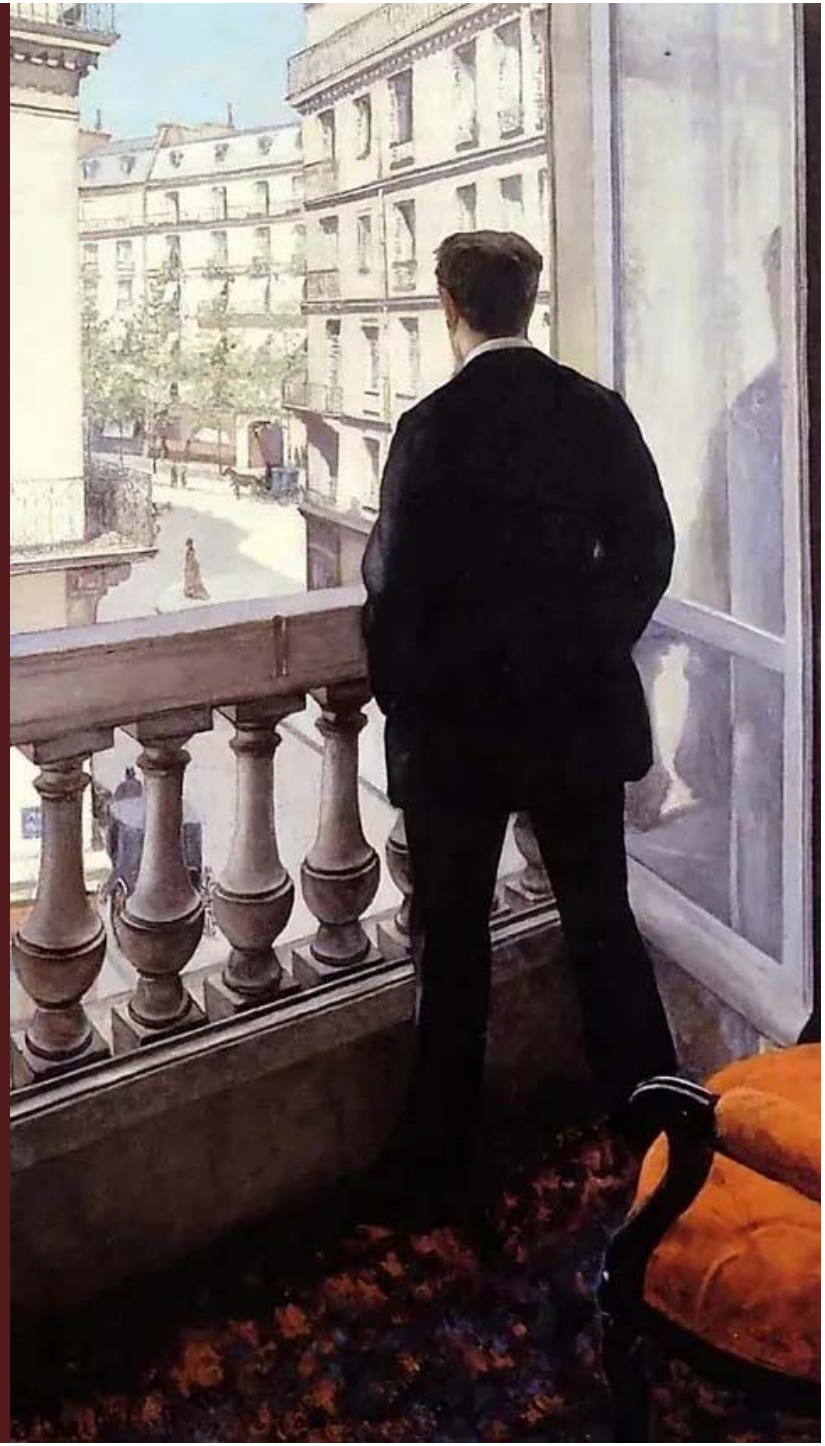
In the continuum of care model, individuals are basically tracked through a system of health services that are to be provided at different stages along the model by different healthcare providers. The model is typically created and designed to either address healthcare needs over the lifespan or to address healthcare needs over the trajectory of a particular illness or disease.

The typical continuum of care model is not patient-centered care but rather focuses on predetermined health needs set up by an organization or agency, (for example, a health insurance company, hospital, primary care or managed care practice,) and accommodating individuals and their medical and health/healthcare needs, whether lifespan or pertaining to a specific illness, according to these predetermined categories.

Many agencies who follow a continuum of care model in their medical practice often describe their model as “integrative care,” but typically they are referring to their inclusion of multiple services into their planning strategies along their designed continuum, leaving out the true integrative healthcare model’s primary focus on the client as expert in the experience of their illness and the essential and key member of the medical team, and omitting the inclusion of complimentary medical treatments.

"The question is not what you look at, but what you see."

--- Henry David Thoreau



The Immune & Autoimmune Systems

The Immune System

What it does:

- Body's first line of defense against invaders
- Helps protect you from getting sick
- Promotes healing
- Adapts to new perceived challenges and threats

It's made up of a large network of:

- Organs
- White blood cells
- Proteins
- Chemicals

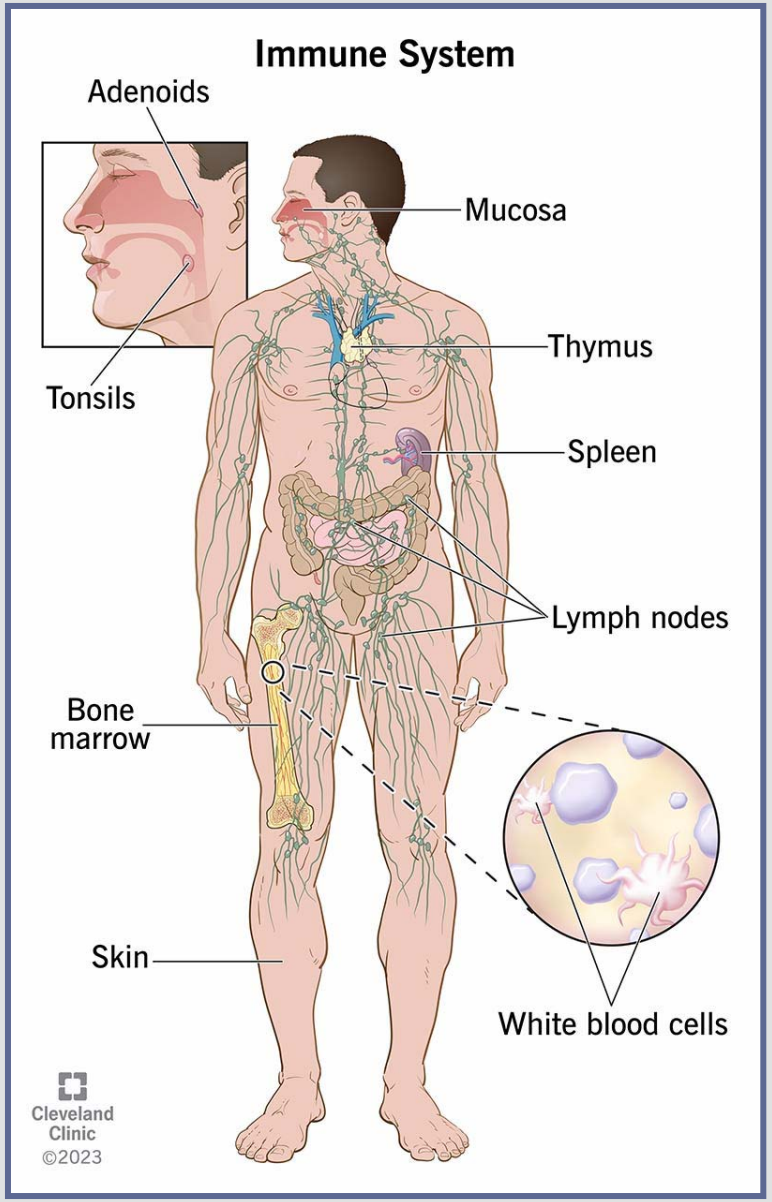
When working properly it:

- Tells the difference between cells that are yours and ones that don't belong in your body
- Activates and mobilizes to kill germs that may be harmful
- Ends an attack once the threat is gone
- Learns about germs after you've had contact with them and develops antibodies against them
- Sends out antibodies

The Immune System

Parts of the body that make up the immune system:

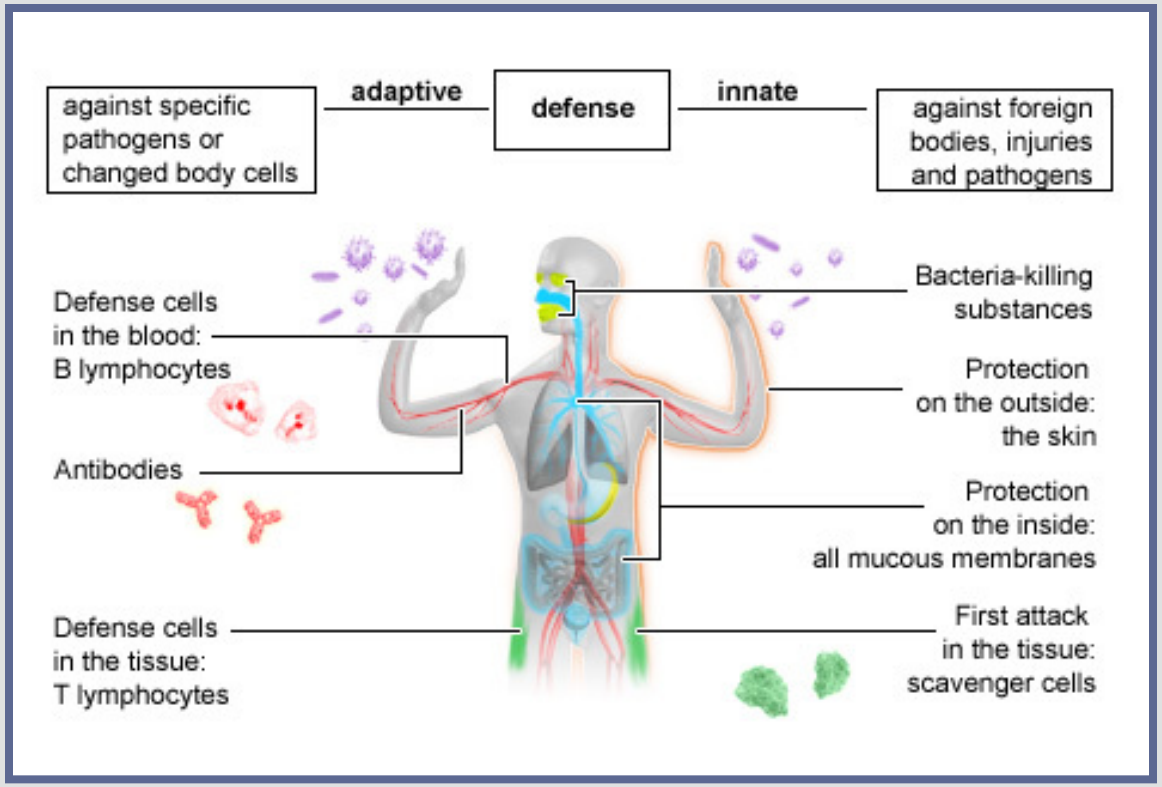
- **White blood cells** (attack & eliminate harmful germs)
- **Antibodies** (proteins that protect)
- **Cytokines** (chemical messenger proteins)
- **Compliment system** (proteins that team up to help)
- **Lymph nodes** (filter waste products)
- **Spleen** (stores white blood cells)
- **Tonsils & adenoids** (trap invaders as soon as they enter)
- **Thymus** (helps T-Cells—a type of while blood cell)
- **Bone marrow** (factory for your blood cells)
- **Skin** (protective barrier helps stop germs entering)
- **Mucosa** (3-layered membrane lines cavities and organs; secretes mucus that captures invaders for body to then clear out)



The Immune System

There are two main components of the body's defense against pathogens mechanism:

The innate immune system & the adaptive immune system



The innate immune system:
Responds the same way to all germs and foreign substances. It acts very quickly but can't always stop germs from spreading. All outer and inner surfaces of human body are a key part of innate immune system.

The adaptive immune system:
Fights germs directly. It specifically targets type of germ causing the infection. It, first, needs to recognize the germ so it moves more slowly to respond than the innate immune system.

The Immune System

What is the autoimmune system?

When our immune system is not working properly, we call it the autoimmune system. “Autoimmune System” refers to the malfunction of the immune system.

The malfunctioning immune system mistakenly attacks the body’s own healthy cells, tissues, and organs.

This happens when the immune system is not able to tell the difference between foreign substances and the body’s own cells.

Autoimmune Disorders

Autoimmune Disorders

Autoimmune Disorders vs. Inflammatory Disorders

Both autoimmune disorders and inflammatory disorders are conditions where the body's immune system malfunctions. They differ in which part of the immune system is affected.

Autoimmune Disorders/Diseases

Involve dysfunction of the adaptive immune system, where the immune system mistakenly attacks healthy cells leading to chronic inflammation and tissue damage. They often require treatments that target the adaptive immune system such as immunosuppressants.

Autoinflammatory Disorders/Diseases

Caused by a dysfunction of the innate immune system leading to recurrent episodes of sterile inflammation without the involvement of adaptive immunity. Characterized by periodic or chronic systemic inflammation. May be managed with anti-inflammatory medications or biologics that target specific proteins.

Current Research:

Recognizes the overlapping features between autoimmune and autoinflammatory disorders, suggesting a spectrum rather than having distinct boundaries. Some conditions exhibit characteristics of both auto-immunity and autoinflammation which highlights the complexity of immune system-regulated disorders (see El-Shebiny, Zahran et al 2021, https://ejim.springeropen.com/articles/10.1186/s43162-021-00040-5).

Autoimmune Disorders

There are more than 100 different autoimmune disorders/diseases. They can affect almost any organ or tissue of the body, depending on where one's immune system malfunctions.

Joints & Muscles:
Rheumatoid Arthritis (RA); Lupus; Myositis

Skin & Blood Vessels:
Sjogren's syndrome; Psoriasis; Scleroderma; Urticarial vasculitis

Digestive System:
Crohn's disease; Celiac disease; Ulcerative colitis

Endocrine System:
Type 1 diabetes; Addison's disease; Hashimoto's disease; Graves disease

Nervous System:
Multiple sclerosis (MS); Myasthenia gravis; Guillain-Barre syndrome; Chronic inflammatory demyelinating polyneuropathy (CIPD)

Understanding Comorbidity

Terminology

Definitions:

Morbidity – the state of being diseased

Comorbidity – the presence of one or more additional diseases or disorders co-occurring with a primary disease or disorder

from: *Taber's Cyclopedic Medical Dictionary*

Comorbidity

Comorbidities are medical conditions a person may have in addition to a primary diagnosis. A person can have one or more comorbidities. Morbidity, in medicine, refers to the state of having a specific disease or condition. Adding “co” in front of this word means two or more conditions occurring together.

Comorbidities aren’t in separate compartments. Comorbidities can interact in ways that can affect one’s health and one’s approach to managing their health needs.

Other terms people sometimes use to describe comoribidities:

- Coexisting conditions
- Associated conditions
- Related conditions
- Multiple chronic conditions
- Multimorbidity

Primary vs. Principal Diagnosis

In acute medical situations:

A medical primary diagnosis is the main condition or illness that a person presents with during a visit to their healthcare provider. It is the condition chiefly responsible for the person being at the doctor's office (or hospital, or urgent care, etc.)

The primary diagnosis is the reason why the person received medical care.

A principal diagnosis, on the other hand, is the condition, after study, which Is specific to that doctor visit (with the primary diagnosis sometimes being more general.)

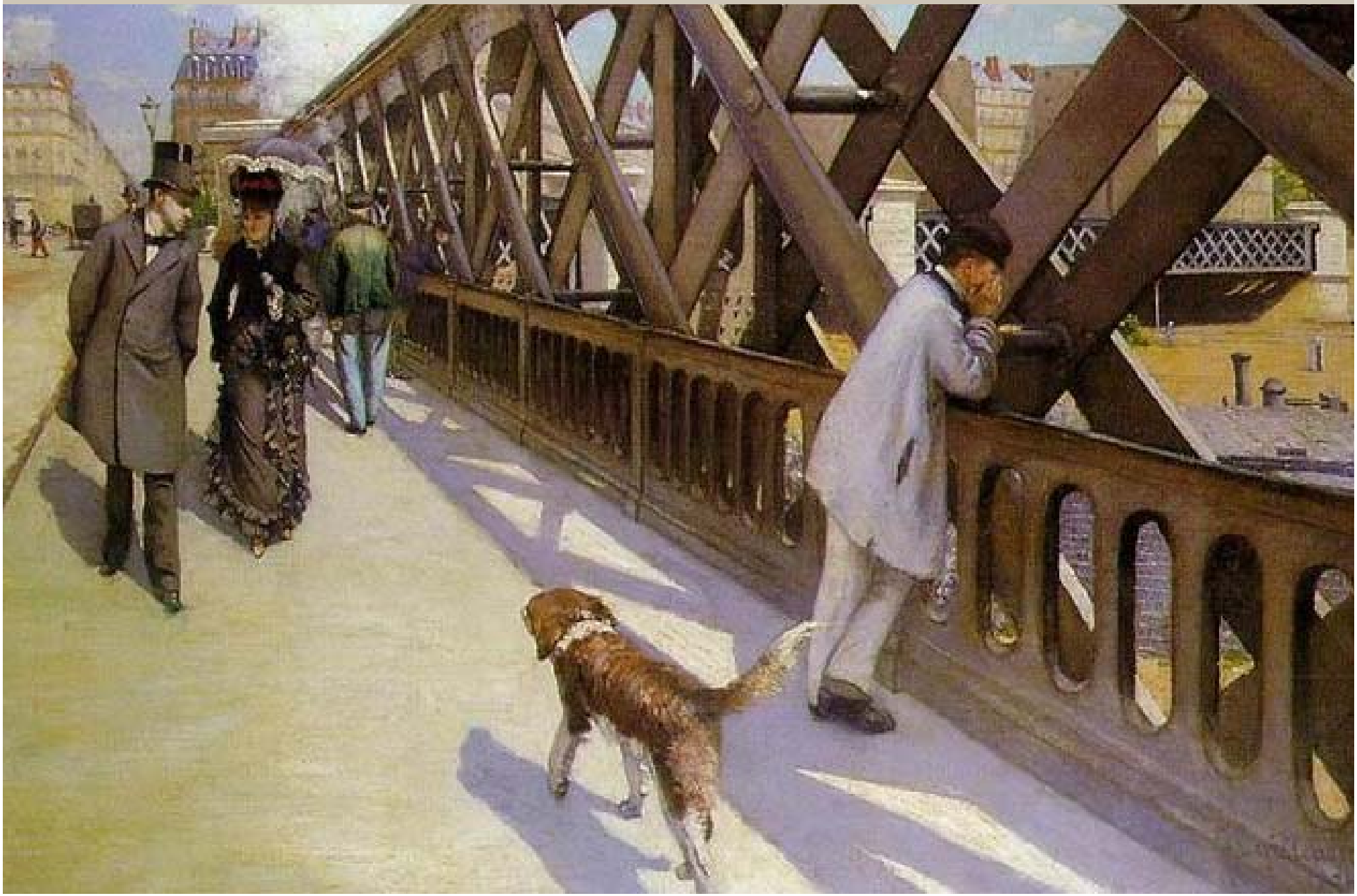
Example:
A person is admitted for a total knee replacement due to osteoarthritis. During the hospital stay, the person might suffer a myocardial infarction. In this scenario, the principal diagnosis would be osteoporosis while the primary diagnosis would be the acute myocardial infarction because it was the most resource-intensive condition.

Primary vs. Principal Diagnosis

In chronic illness medical situations:

- A **primary diagnosis** may be the chronic condition itself
- A **principal diagnosis** may be an acute exacerbation or complication of that chronic condition
- The principal diagnosis is specific to each encounter, the reason for each medical visit to your healthcare provider, and can be different each visit
- The primary diagnosis may remain the same over multiple encounters with your healthcare provider

Where do Mast Cell Diagnoses Fit?



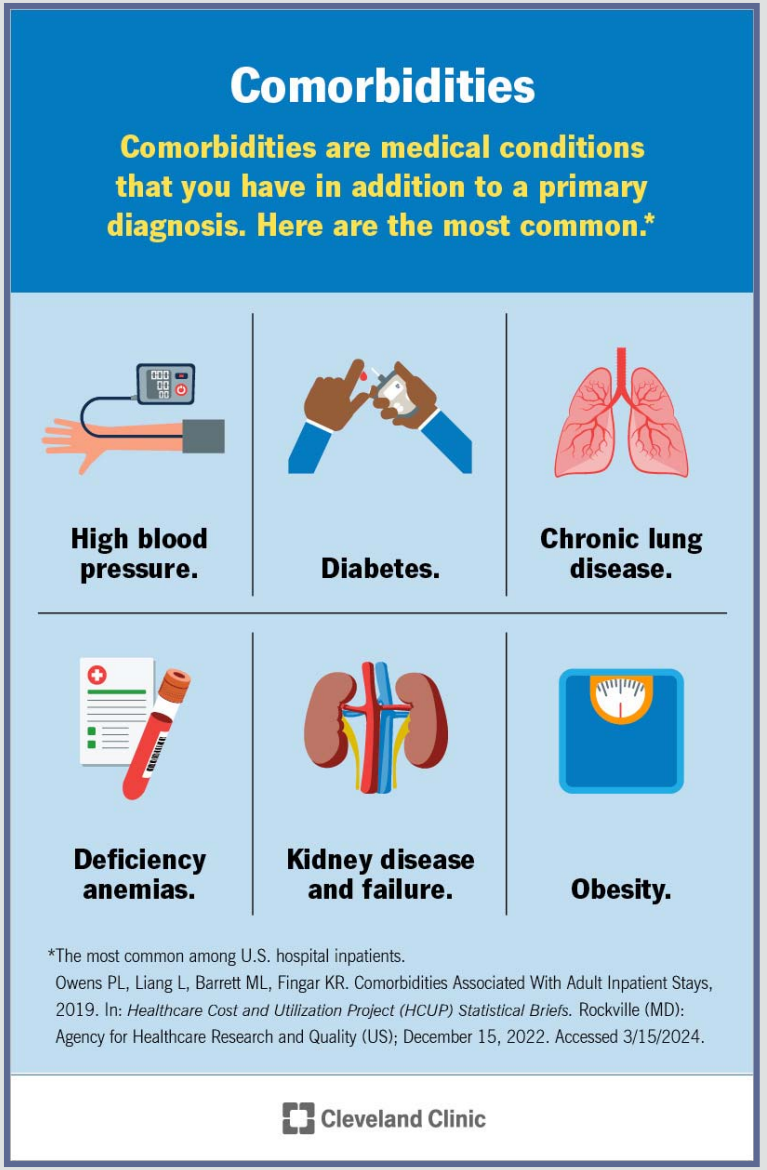
They Don’t Fit the Mainstream Model

Comorbidity

Comorbidities & Main Stream Primary Diagnoses:

- **ADHD** with depression, anxiety, bipolar
- **Arthritis** with COPD, dementia, diabetes
- **COPD** with cardiovascular diseases, osteoporosis, anxiety, depression, GI diseases, asthma
- **Heart Failure** with type 2 diabetes, sleep apnea, obesity, HTN
- **Type 2 diabetes** with HTN, high cholesterol, high triglycerides, obesity

my.clevelandclinic.org/health/articles/comorbidities



Comorbidity & Mast Cells

Mastocytosis Society Canada lists on their website 36 different disorders from a survey they conducted of existing mast cell patients in Canada. The list includes the following conditions as comorbid to a primary mast cell diagnosis:

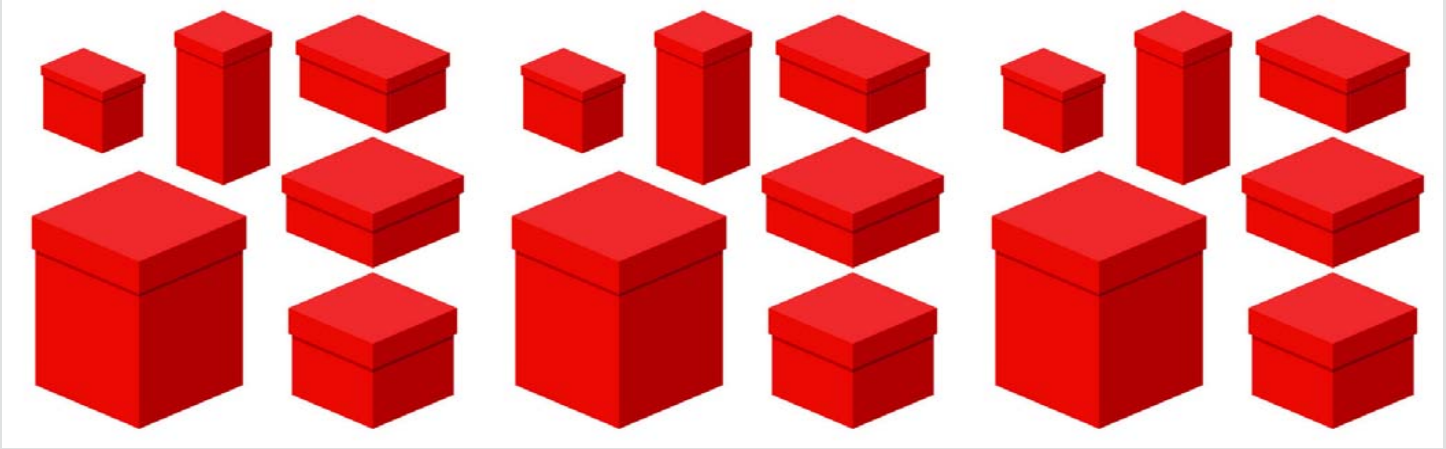
- Addison's Disease
- Anaphylaxis
- Anemia
- Angioedema
- Arthritis & specific rare diseases of arthritis: Rheumatoid Arthritis
  Sjogren's
  Raynaud's
  Osteoarthritis
  Ehlers-Danlos
  Fibromyalgia
  Lupus
- Cerebral Tumour
- Charcot-Marie Tooth
- Chronic Fatigue Syndrome
- Depression & Anxiety
- Diabetes
- Discoid Lupus Erythematosus (DLE)
- Dysautonomia
- Eosinophilic esophagitis
- Hypercalcemia
- Hypertension
- Interstitial Cystitis (Bladder Pain Syndrome)
- Macular Degeneration
- Mitral Valve Prolapse
- Multiple Chemical Sensitivity
- Neuropathy
- Osteopenia/Osteoporosis
- Periodontal Disease
- Pituitary Tumor
- Postural Tachycardia Syndrome (POTS)
- Restless Leg Syndrome
- Uveitis (Iritis)
- Vascular Dementia
- Vertigo

Comorbidity & Compartmentalization

Compartmentalization, within the context of medical comorbidity, refers to understanding health and diseases through a lens of separation, as if each diagnosis that a person may carry is in a separate box or a separate compartment from the others. It represents a fragmentation – of knowledge and of understanding. It also represents a fragmentation in the provision of care.

Through focusing closely on each "compartment" or specialty area, we lose the broader picture, dot's aren't connected, and, ultimately, patients suffer.

How can doctors and medical professionals correctly diagnose and appropriately treat something they haven't been trained to recognize and they don't fully understand?



Thinking Outside the Box

With mast cell activation related issues and disorders:

- What *is* the primary diagnosis?
- When is mast cell activation the *cause*?
- When is mast cell activation *not the cause* but an influencing factor that should not be ignored?
- Autoimmune disorders involve mast cell activation and mast cell behaviors to varying degrees depending on each person. How does this individuality in each person's presentation of symptoms affect a primary diagnosis?
- How might mast cell activation awareness and knowledge possibly change our understanding of comorbidity, if at all?
- Is it comorbidity or cause and effect?

Supporting Health

Strategies for Self-Care

Supporting our health begins with awareness. Awareness includes understanding the details of our unique health needs, our physical health, and how highly individualized mast cell activation related issues and disorders are for each person in what they experience and their presentation of symptoms. We need to know when to stop, to not push ourselves into mast cell activation reactions, being wise and informed regarding our life, health, and life-style choices.

- **Food as medicine** – understanding food and food choices as tools for health and managing reactions
- **Circadian rhythms** – (mast cells have their own!) and the importance of keeping to regular schedules for sleeping, eating, and exercise while understanding how our body works at these deeper, cellular levels to support our individualized health needs
- **Retraining mast cells, retraining our brains**
- **Medications**
- **Stress management interventions** – such as mindfulness, yoga, tai chi, quigong, music, creative arts, exercise, walking
- **Vagus nerve focused breathing**
- **Sleep**

"Our own life has to be our message."

--- Thich Nhat Hanh

References:

O'Brien, R.P. (2016) *Eco-Health & the Continuum of Care*, Boston

Molderings, G. and Afrin, L., "A survey of the currently known mast cell mediators with potential relevance for therapy of mast cell induced symptoms" (27 May 2023).

Sjogren's Disease - https://www.mayoclinic.org/diseases-conditions/sjogrens-syndrome/symptoms-causes/syc-20353216

Adrenal glands & Mast Cells - https://search.brave.com/search?q=adrenal+glands+and+mast+cells&source=web&summary=1&conversation=72a00e5912e5bdcad55442

Autoimmune
https://www.hopkinsmedicine.org/health/wellness-and-prevention/what-are-common-symptoms-of-autoimmune-disease

https://www.hopkinsmedicine.org/health/wellness-and-prevention/what-are-common-symptoms-of-autoimmune-disease

https://my.clevelandclinic.org/health/diseases/21624-autoimmune-diseases

Immune System
https://www.hopkinsmedicine.org/health/conditions-and-diseases/the-immune-system

Innate & Adaptive - https://www.ncbi.nlm.nih.gov/books/NBK279396/

Medical Model
https://search.brave.com/search?q=what+is+the+managed+care+medical+model&source=web&summary=1&conversation=ea11236409f103d99a4267

Continuum of Care
https://search.brave.com/search?q=what+is+the+managed+care+continuum+of+care+medical+model&source=web&summary=1&conversation=f378a8d8d3dff07bf8c048

Artwork & Artist:

- **Walter Sickert -** slides 1, 22
- **Mary Cassatt** – slide 9
- **Gustave Caillebotte** – slides 5, 28, 37, 42, 48, 51, 52