


Anxiety Disorders

Computational Psychiatry Course 2021

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Outline

- ▶ Introduction
 - ▶ Case studies: Generalized anxiety, Social anxiety, Agoraphobia, Panic disorders,
Specific phobias combined with symptoms
 - ▶ Comorbidities
 - ▶ Differential diagnosis
 - ▶ Diagnostics
 - ▶ Pathomechanism
 - ▶ Treatment
 - ▶ Prognosis
- 
- Clinical perspective

Introduction

Anxiety → Fear

Fear

- alarm response to a present threat
- trigger to fight or flight (survival)
- symptoms: sweating, trembling, heart palpitation, nausea

Anxiety

- future-oriented mood state
- preparation for possible negative events
- avoidance
- Fear symptoms + muscle tension

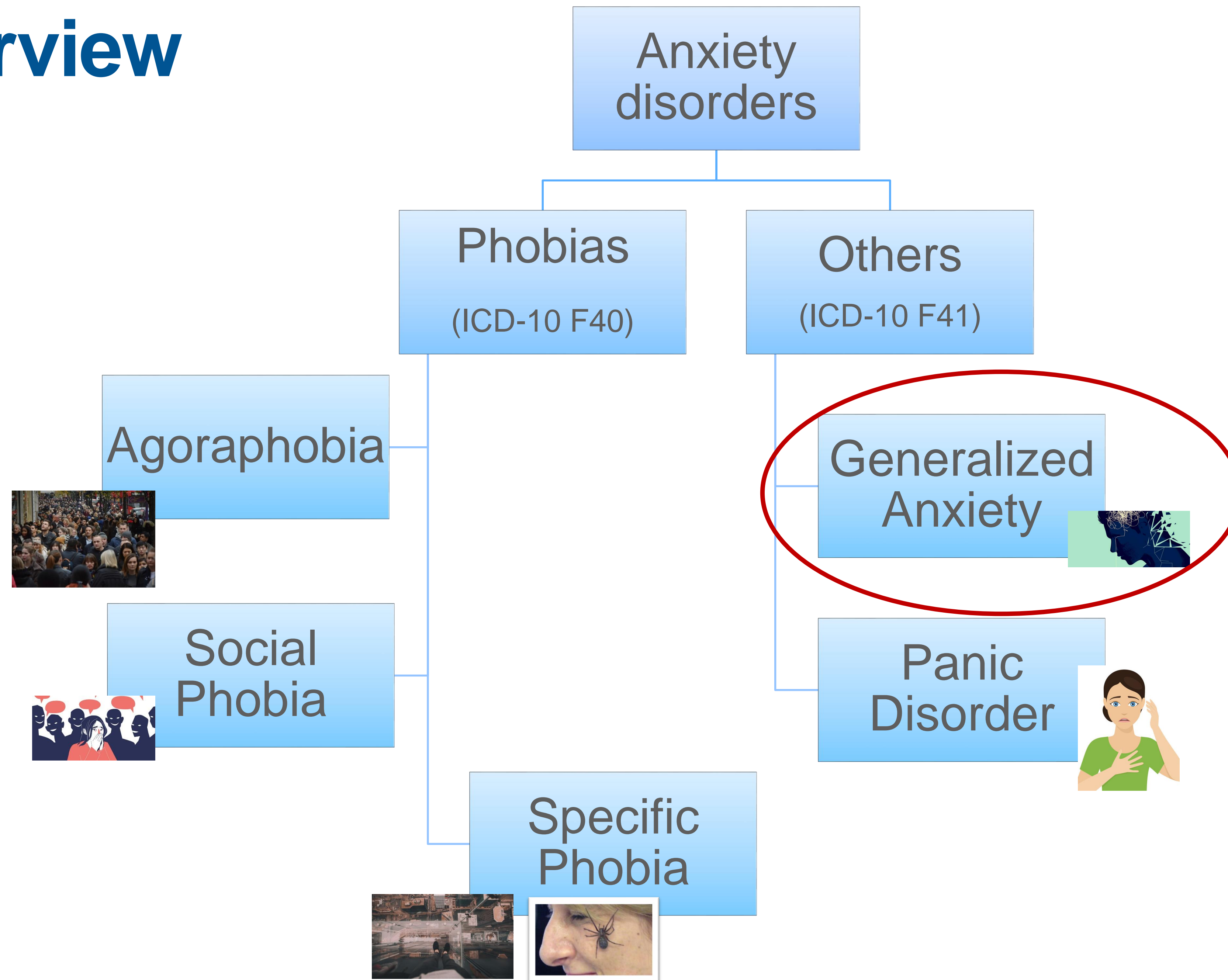
Anxiety disorders

- Cluster of various types of anxiety disorders
- Significant and uncontrollable feelings of anxiety
- Huge impact on social, occupational & personal life

Epidemiology

- ▶ Lifetime prevalence: 15-20% (2:1 = f:m)
- ▶ Prevalence post-COVID infection: 47%
- ▶ High burden of disease (quality of life, chronicity, disability)
- ▶ Starts in childhood (mean age of onset: 11 years)
- ▶ High heritability (30-70%)

Overview



ICD-10
classification

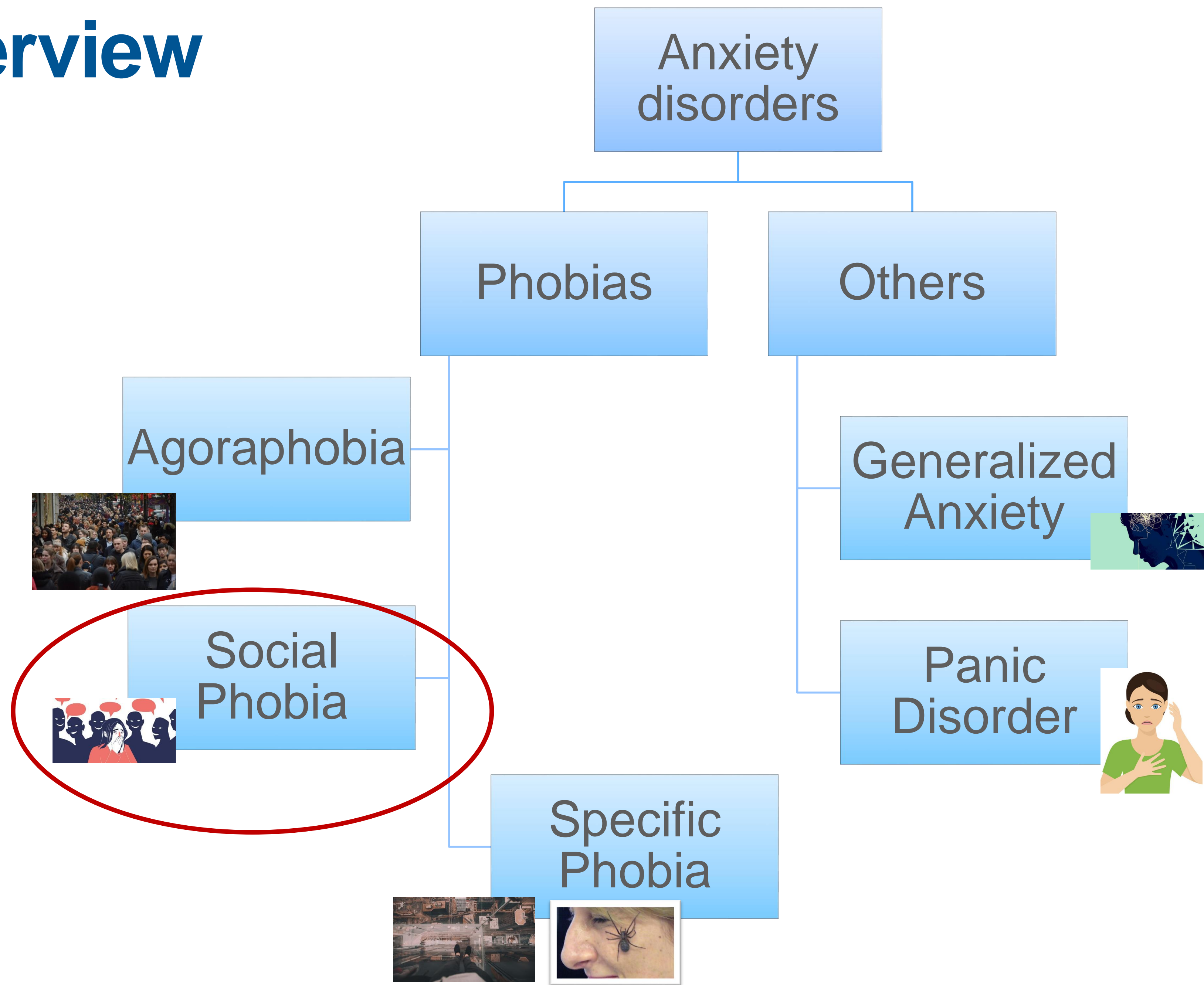
Generalized anxiety disorder (GAD)

Generalized anxiety disorder (GAD)

- ▶ Uncontrollable thoughts
 - ▶ Persistent worries
 - ▶ Different areas: finance, future, health, etc.
 - ▶ Loss of control & low self-efficacy
 - ▶ Low self-confidence
-
- ▶ Physical tension
 - ▶ Insomnia
- Prevalence: 6%



Overview



Social phobia

Social phobia

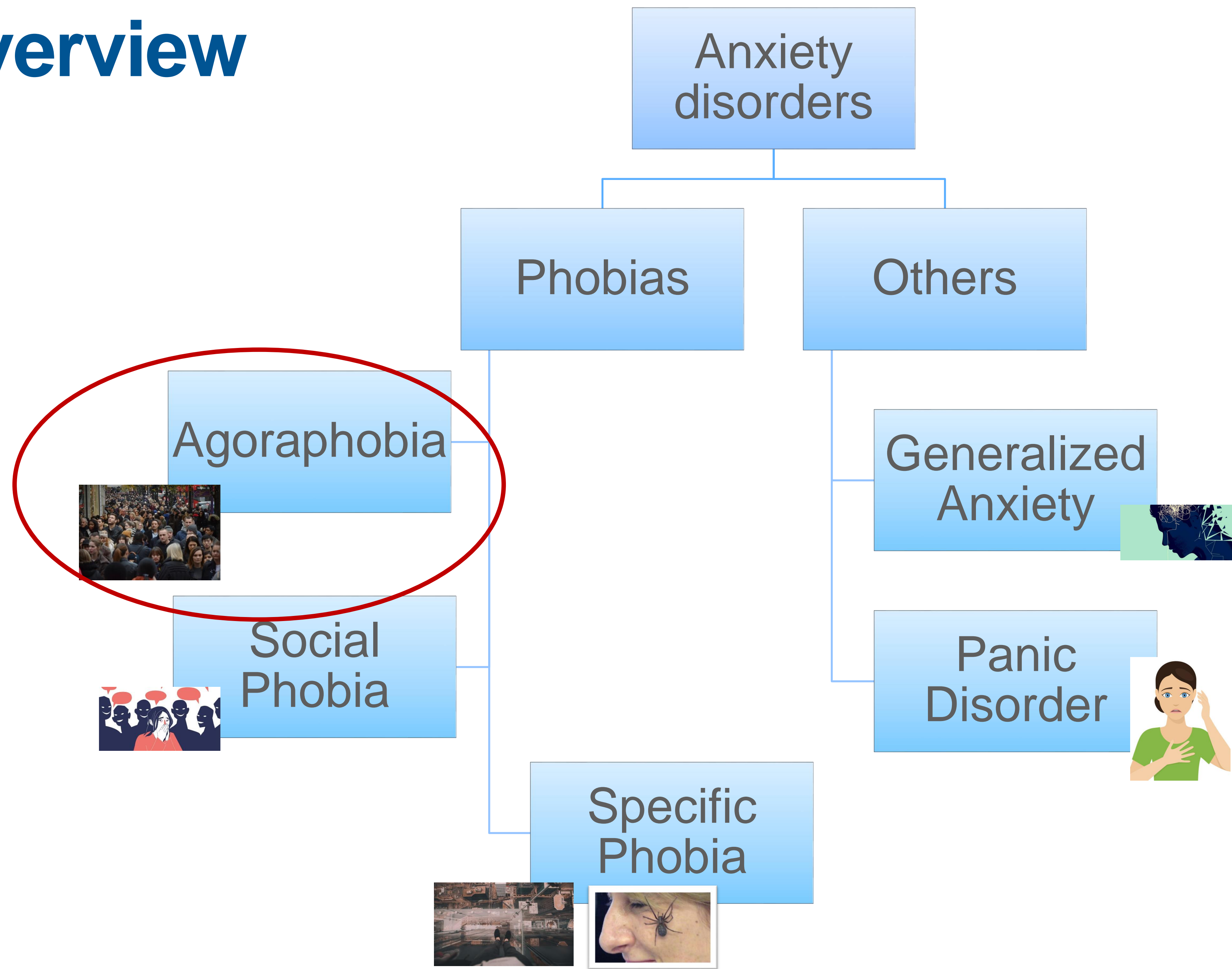
- ▶ Restricted to social situations
- ▶ Examples: Talking to an audience,
Eating in groups, Waiting in line
- ▶ Afraid of being judged/ embarrassed
- ▶ Low self-confidence
- ▶ Physical symptoms (blushing, sweating, jitter,...)

→ **Isolated** or **generalized**

→ Prevalence: 13%



Overview



Agoraphobia

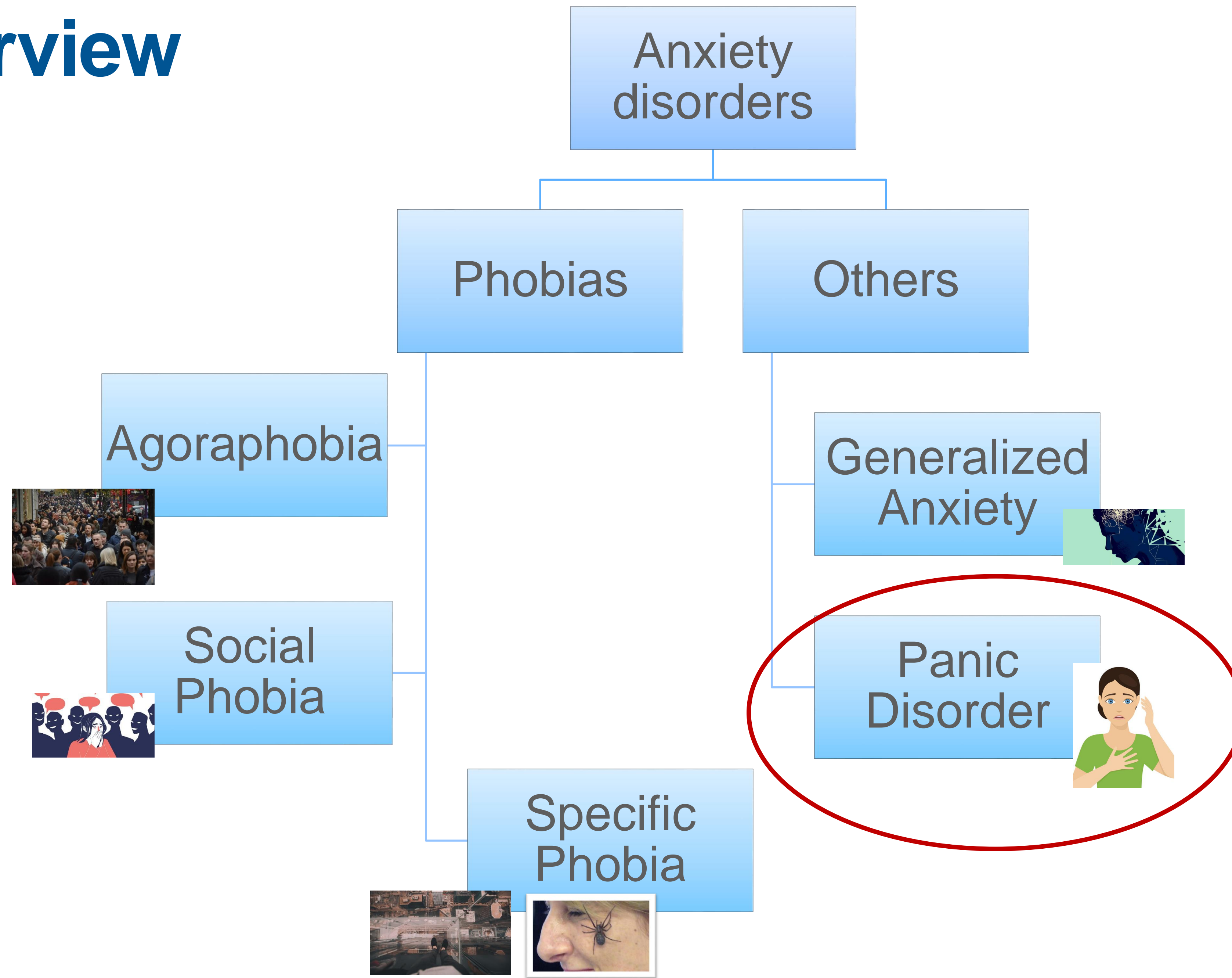
Agoraphobia

- ▶ Fear of places or situations where escape is difficult or no help is available
- ▶ >2 situations: open spaces (e.g. parking lot, street), crowd or
- ▶ enclosed places (shops, public transportation)
- ▶ Trigger physical symptoms/ panic attacks
- ▶ Avoidance of gatherings, public places, traveling alone → social isolation

→ Prevalence: 3%



Overview



Panic disorder

Panic disorder

→ Panic attack:

- Intensive, recurrent fear (10-30 minutes)
- Sudden, unexpected beginning, uncontrollable
- **Cognition:** Misperception of bodily signals
Fear to get crazy, faint or to die
- Physical symptoms: heart palpitation, sweating, chest pain, shortness of breath
- **Trigger:** physical exertion, emotional stress

→ Panic disorder:

- Several panic attacks over 1 months
- Avoidance



Overview



Specific phobias

Restricted to specific objects/situations:

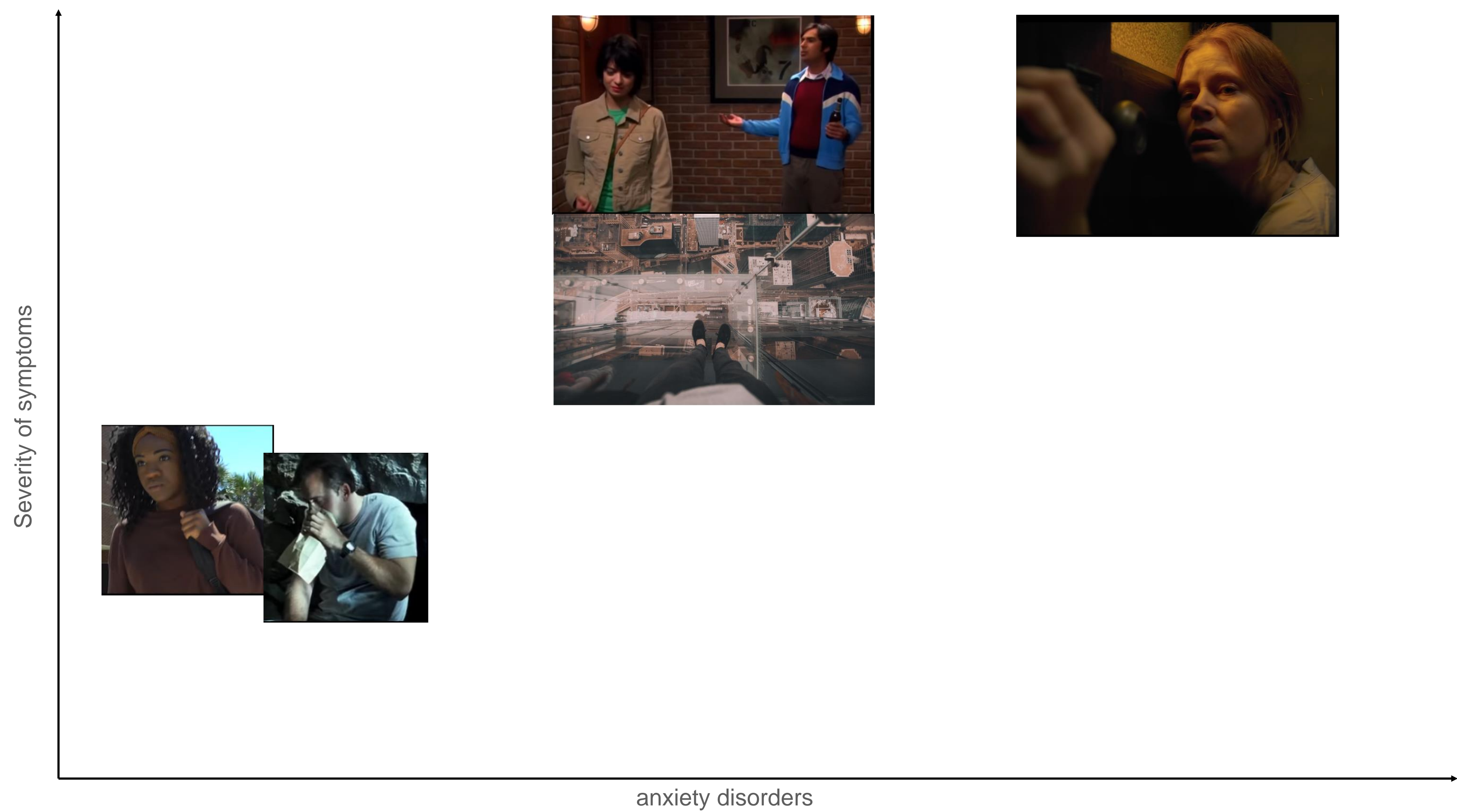
- ▶ Heights (Akrophobia)
- ▶ Animals (Zoophobia), eg. Arachnophobia
- ▶ Flight (Aviophobia)
- ▶ Claustrophobia (confined spaces, e.g. MRI, elevator)
- ▶ Dentist, blood, needle

→ Considerable suffering: Avoidance

→ Prevalence: 5%



Combination of anxiety disorders



Symptoms

Symptoms

Levels of anxiety

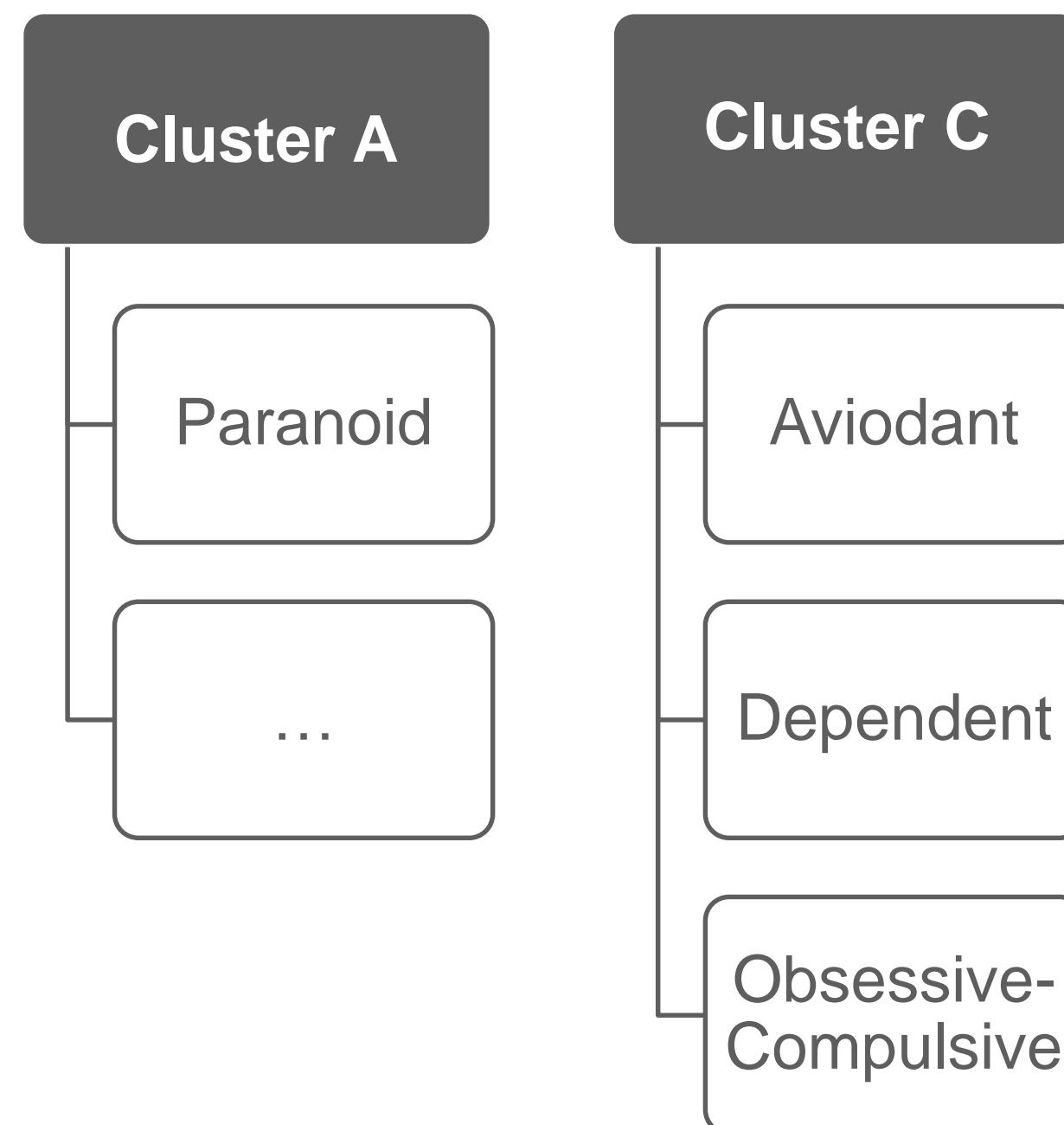
- 1) Vegetative reaction
- 2) Emotional reaction
- 3) Cognition
- 4) Motoric, behavior

Comorbidities

Comorbidities

= additional disorders

- **High comorbidity rate within various anxiety disorders**
- Depression
- Alcohol or substance addiction (self-medication)
- Personality disorders:



**Co-treatment of
comorbidity**

**Impact on
progression**

Differential diagnosis

Differential diagnosis

= symptom overlap

Psychiatric disorders

- Affective disorders
- Schizophrenia
- OCD (Obsessive-compulsive disorder)
- PTSD (Post-traumatic stress disorder)

Substance-induced

- Amphetamines/Cocaine
- Steroids

Withdrawal from

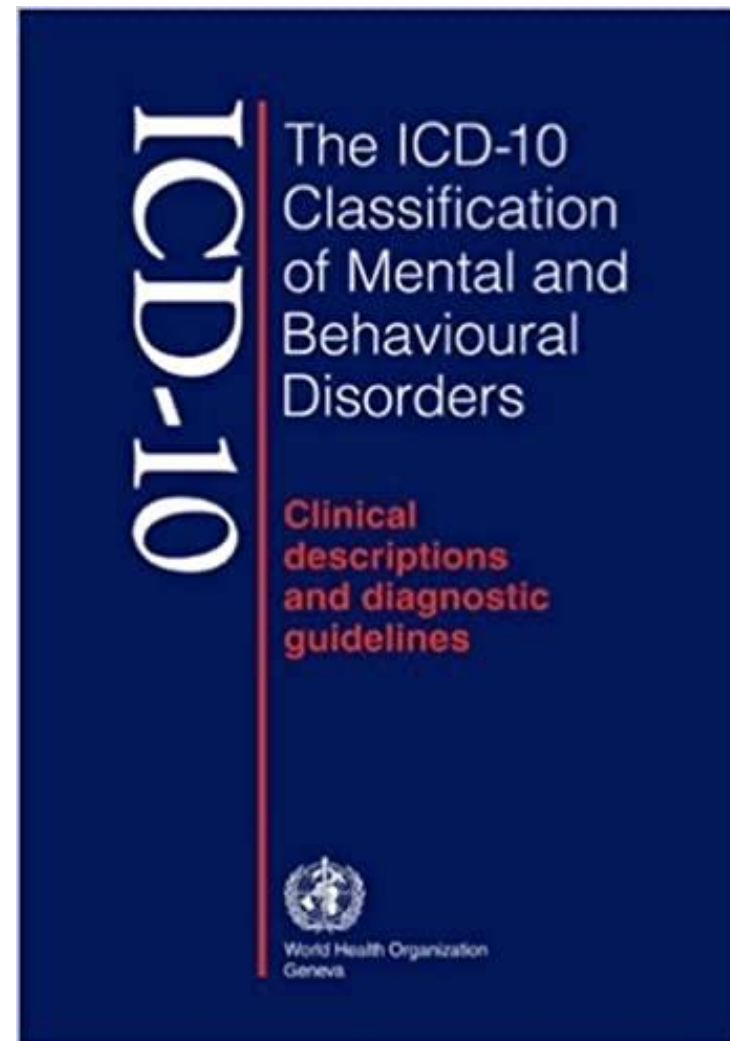
- Alcohol
- Benzodiazepine
- Opioids

Somatic diseases

- Cardiac diseases (Arrhythmia, heart attack)
- Pulmonary diseases (Asthma, embolism)
- Allergic reaction
- Thyroid dysfunction
- Dizziness, Low blood-sugar, etc.

Diagnostics

Diagnostics



Medical History

→ Trigger

→ Physical symptoms

→ Cognition

→ Avoidance behavior

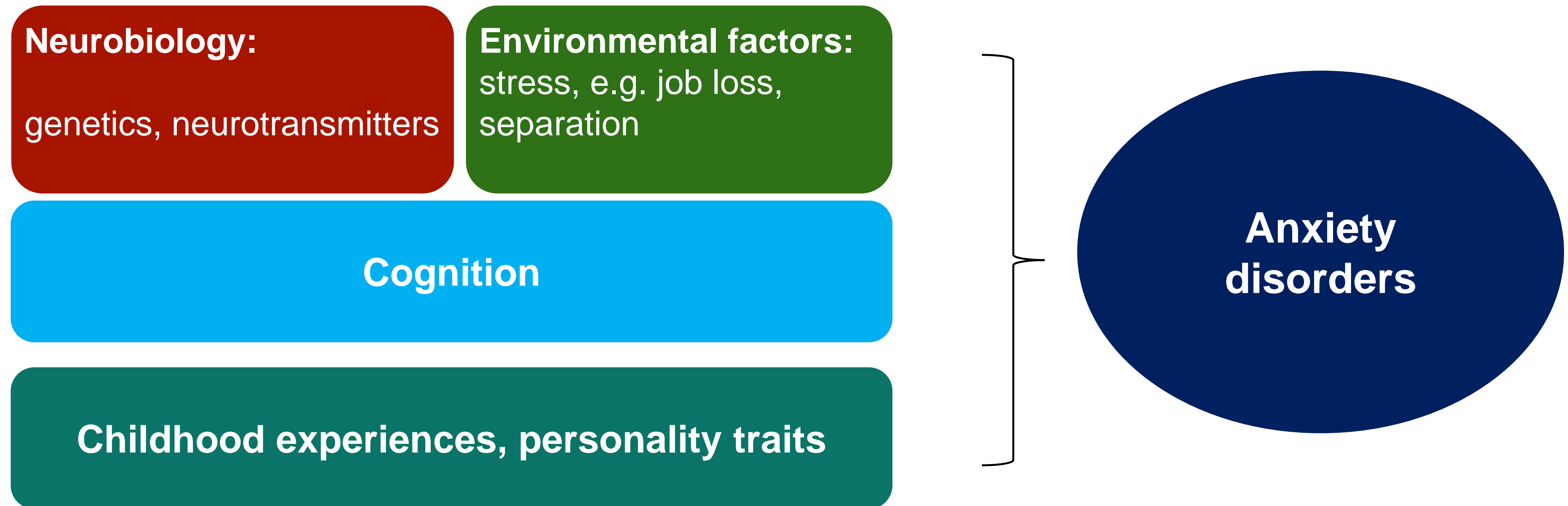
→ Impact on daily life

Exclusion of somatic diseases

- Laboratory tests
- Electrocardiogram (ECG)
- Drug screenings

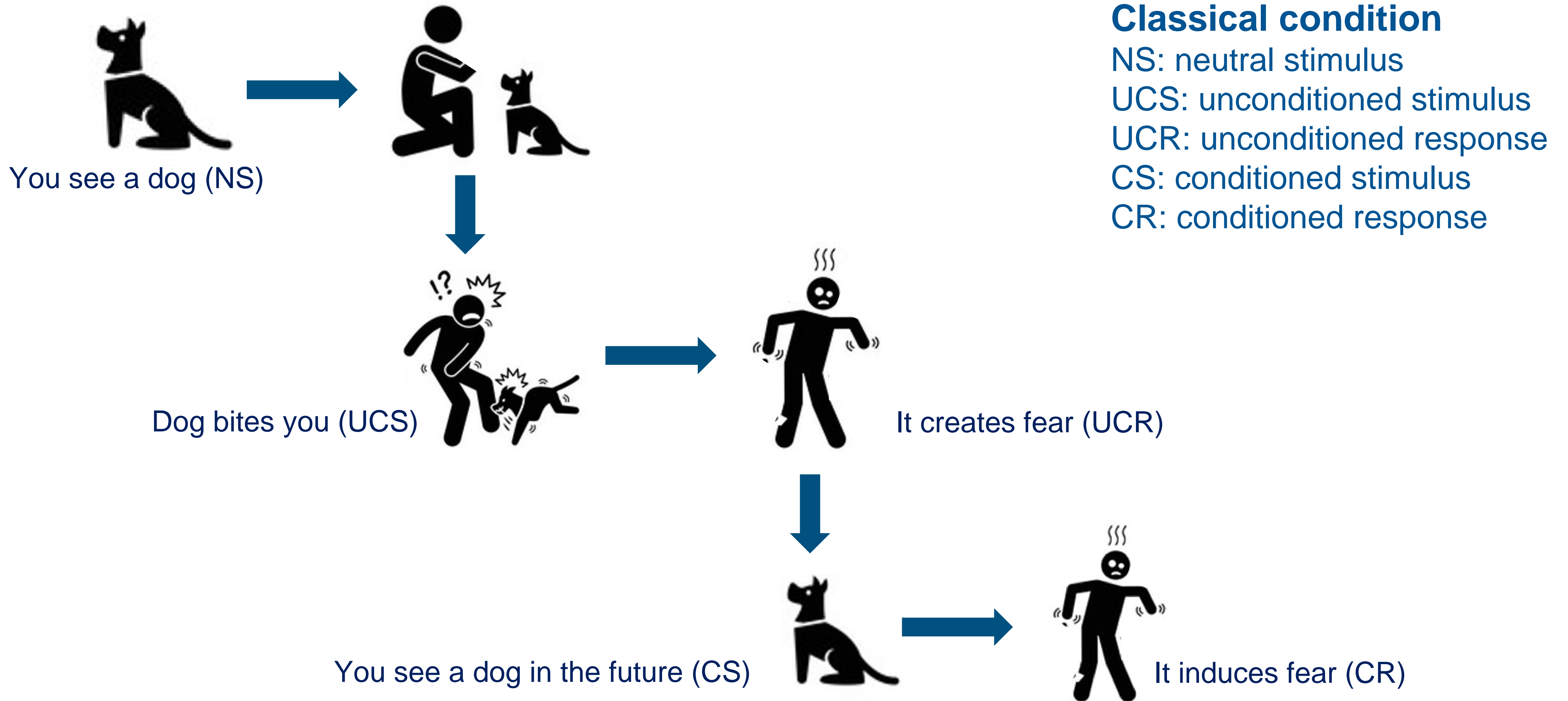
Pathomechanism

Pathomechanism



Learning theory: Mowrer's 2-process model

1. Process: Fear → acquired by **classical conditioning**



Learning theory: Mowrer's 2-process model

2. Process: Avoidance → maintained by **operant conditioning**



Strong fear of dogs →
You avoid all situations with dogs (parks, photos,...)

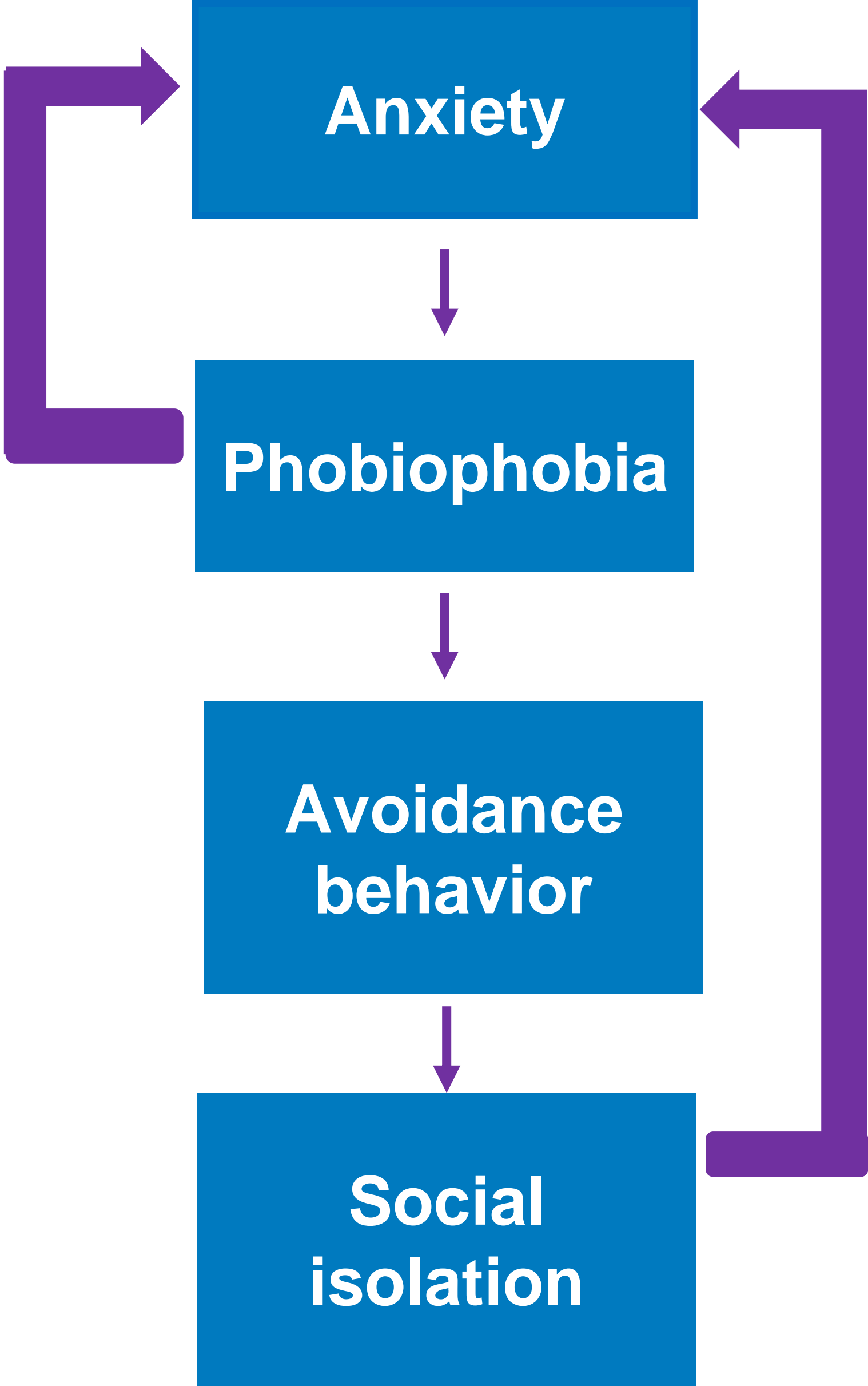


Reward
(no dogs in your life)

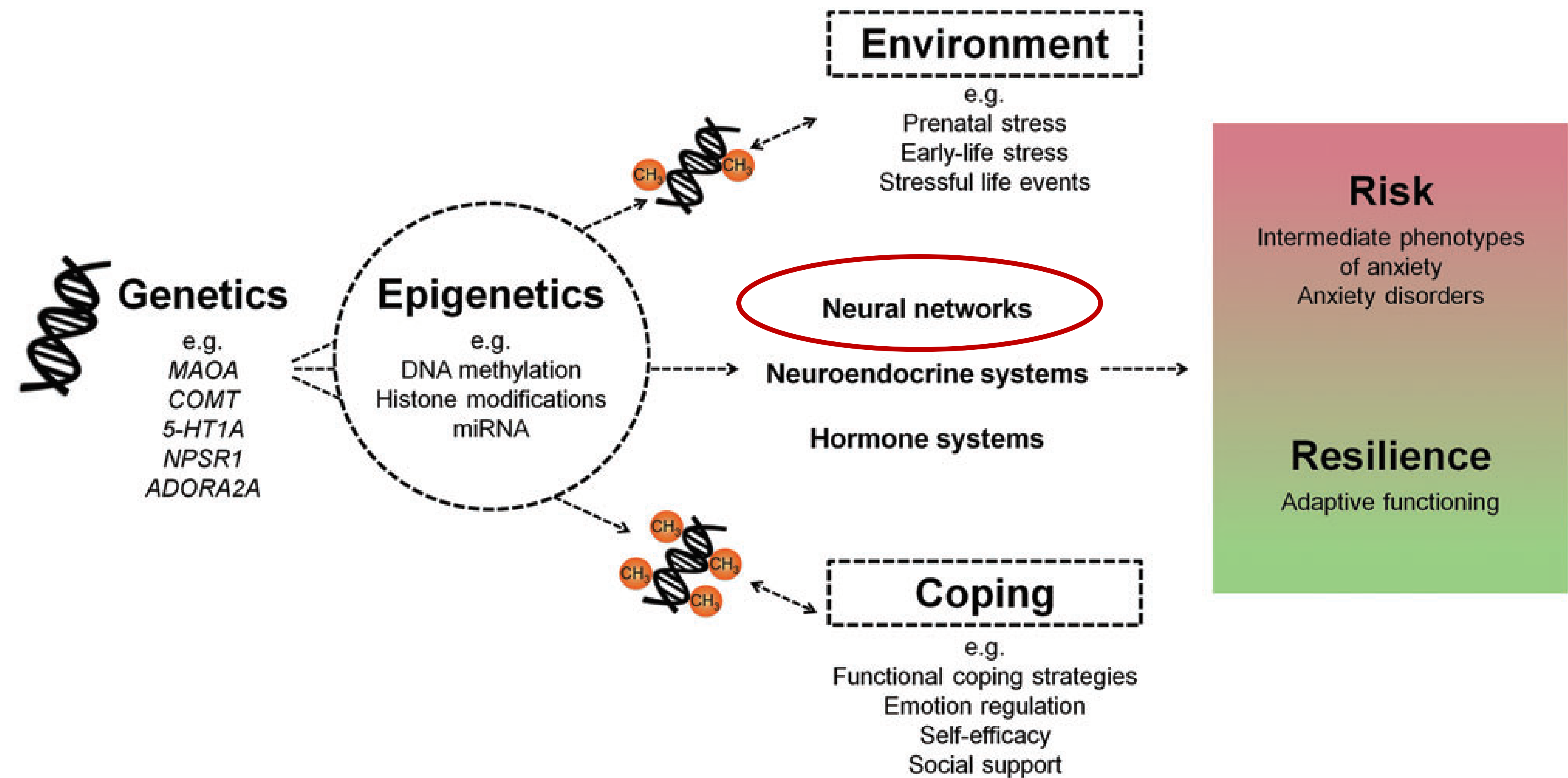


Avoidance strengthens your fear →
Negative Reinforcement

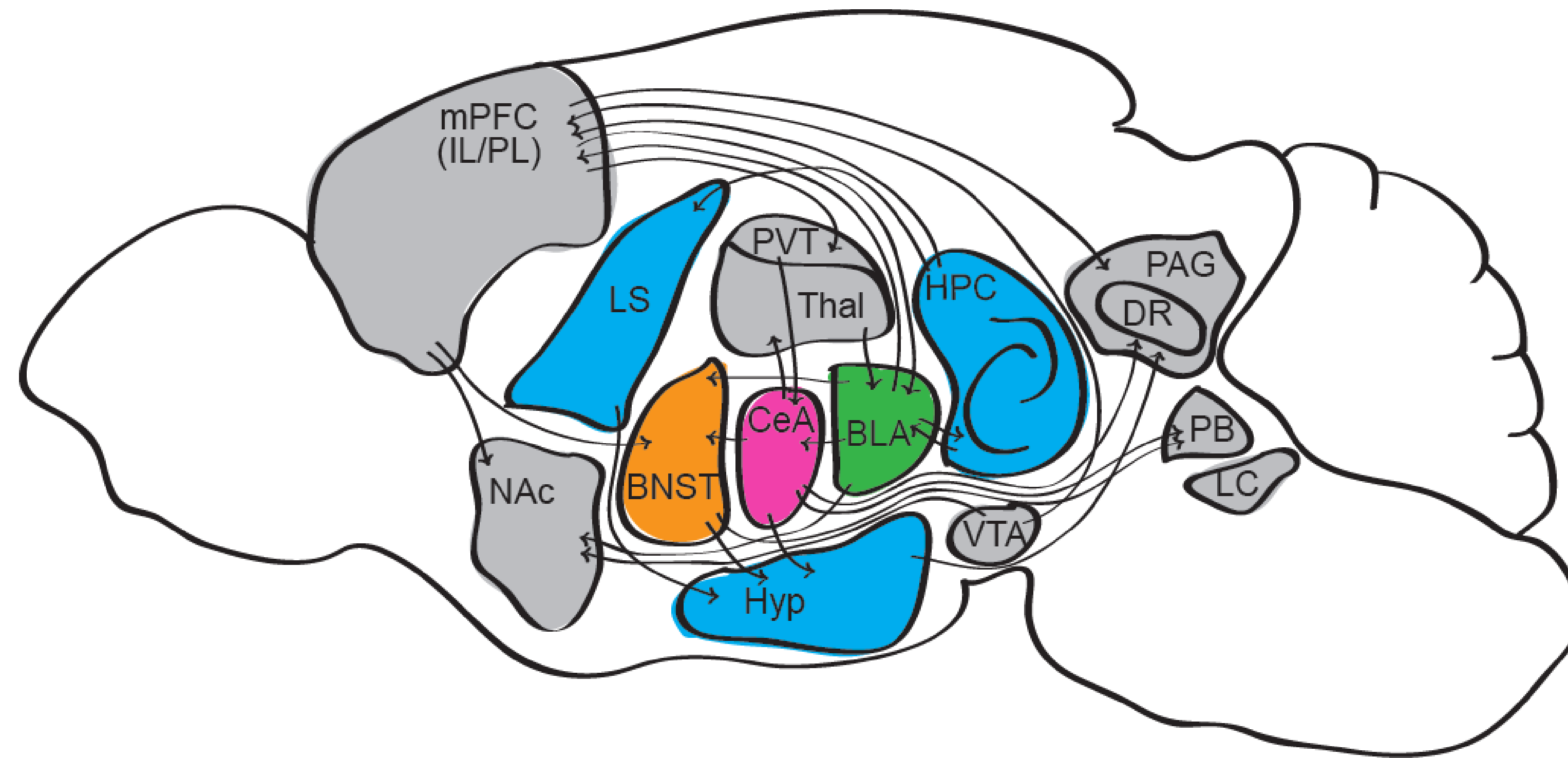
Dysfunctional cognition



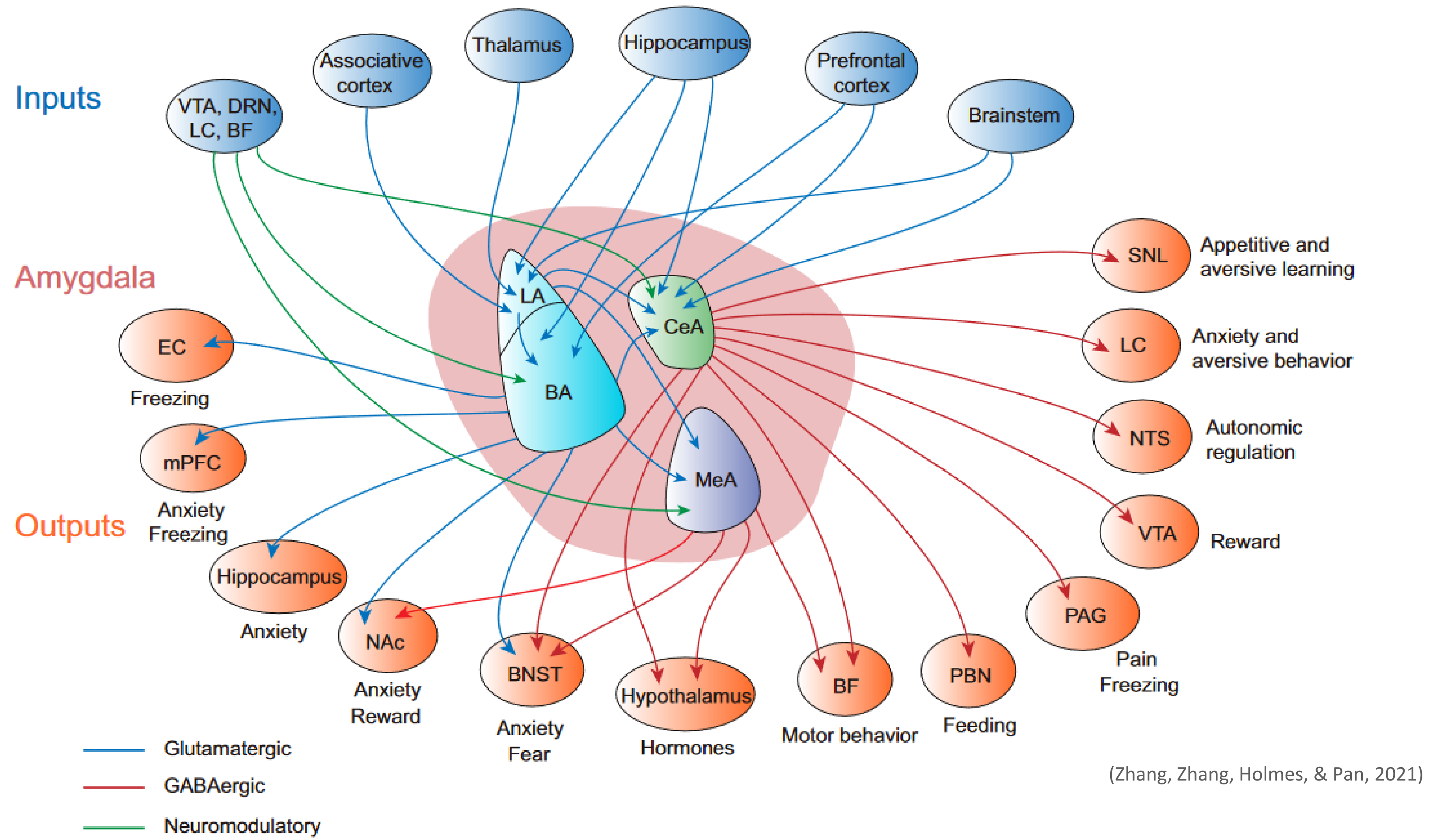
Epigenetics



Neural circuit of anxiety



Amygdala



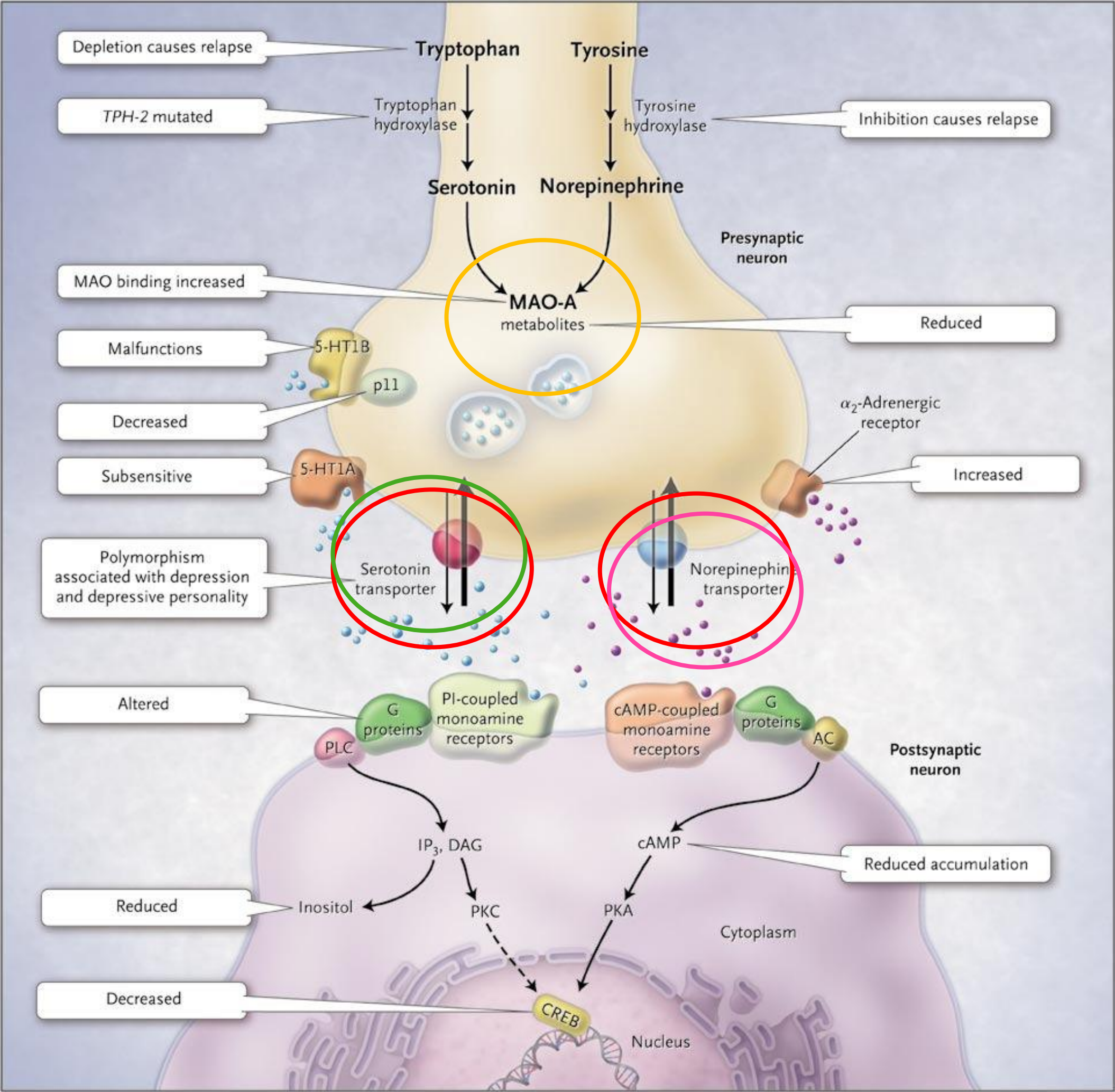
Treatment

Treatment

Psychotherapy:
Cognitive Behavioral therapy
(CBT)

Medication:
Antidepressant,
(Benzodiazepine)

Antidepressant



Antidepressant Nation

By APage

1 in 10 Americans take antidepressants, making them the third most common prescription drug in the U.S. Take a look at the types of antidepressants and know their most common side effects.

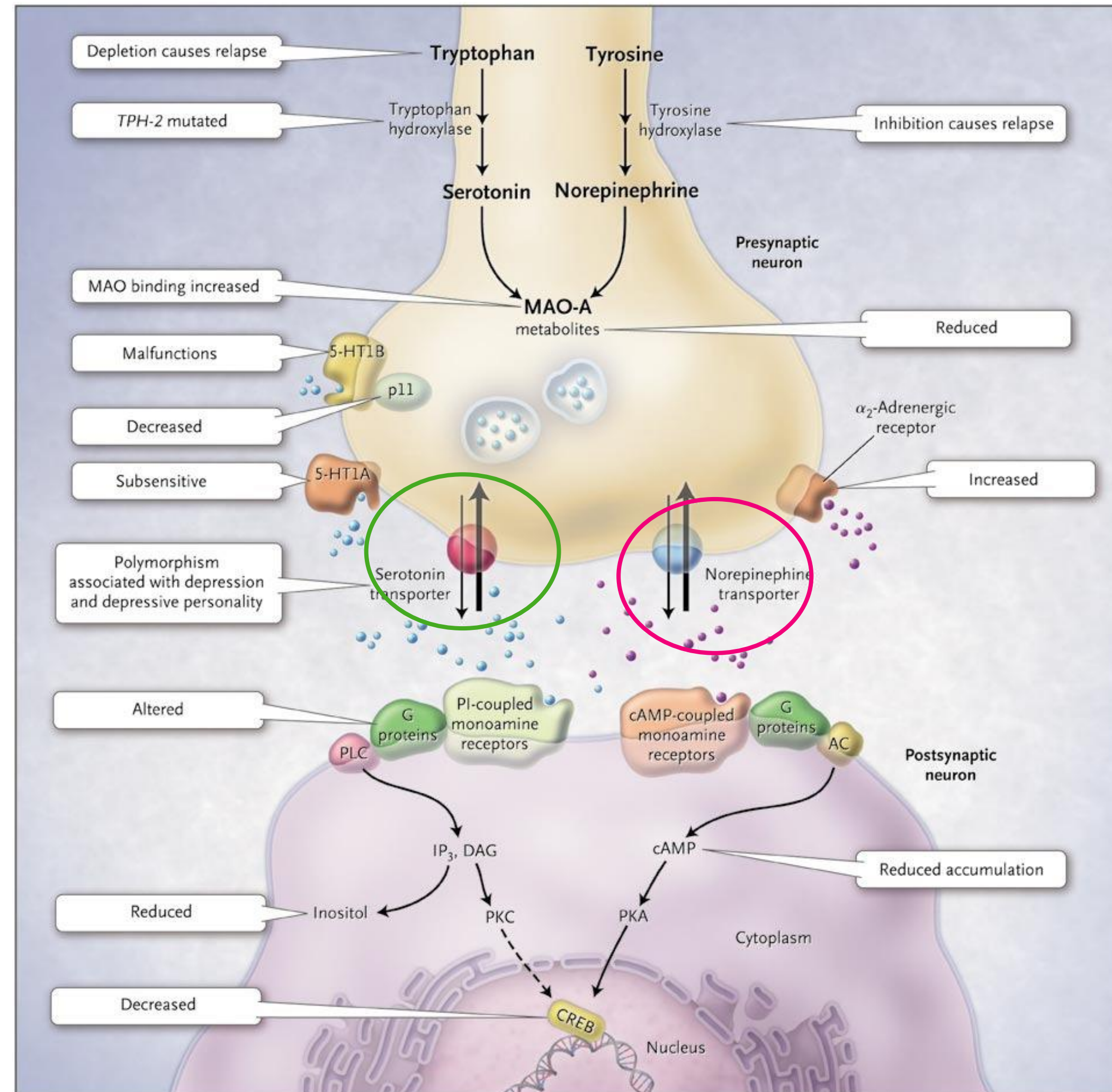
Types of Antidepressants & Common Side Effects

Tricyclics	SSRIs	SNRIs	MAOIs	Newer Combinations
Tremors	Sweating	Tremors	Insomnia	Appetite Changes
Indigestion	Indigestion & Nausea	Nausea	Muscle Aches	Indigestion & Constipation
Headache	Headache	Headache	Low Blood Pressure	Headache
Dry Mouth	Dry Mouth	Dry Mouth	Dry Mouth	Dry Mouth
Drowsiness	Drowsiness	Blurred Vision	Sexual Side Effects	Insomnia
Elevated Heart Rate	Sexual Side Effects	Increased Blood Pressure	Nervousness	Sweating
Common Brand Names:	Common Brand Names:	Common Brand Names:	Common Brand Names:	Common Brand Names:
Elavil	Celexa			Wellbutrin
Asendin	Lexapro			Norpramin
Anafranil	Luvox	Cymbalta	Marplan	Ludiomil
Adapine	Prozac	Serzone	Nardil	Remeron
Sinequan	Paxil	Effexor	Parnate	Desyrel
Tofranil	Zoloft			
Pamelor				
Vivactil				

For a complete list of antidepressants and side effects visit:
<http://www.nimh.nih.gov/health/publications/mental-health-medications/complete-index.shtml>

HealthCentral

Selective Serotonin-/Noradrenaline Reuptake Inhibitor (SSRI/SNRI)



Standard medication for anxiety

- Except for specific phobias

Caution: AD can trigger somatic symptoms

→ Start with low dose

Psychotherapy

Cognitive Behavioral Therapy (CBT)

1) Psychoeducation

2) Cognitive restructuring

3) Interoceptive Exposure

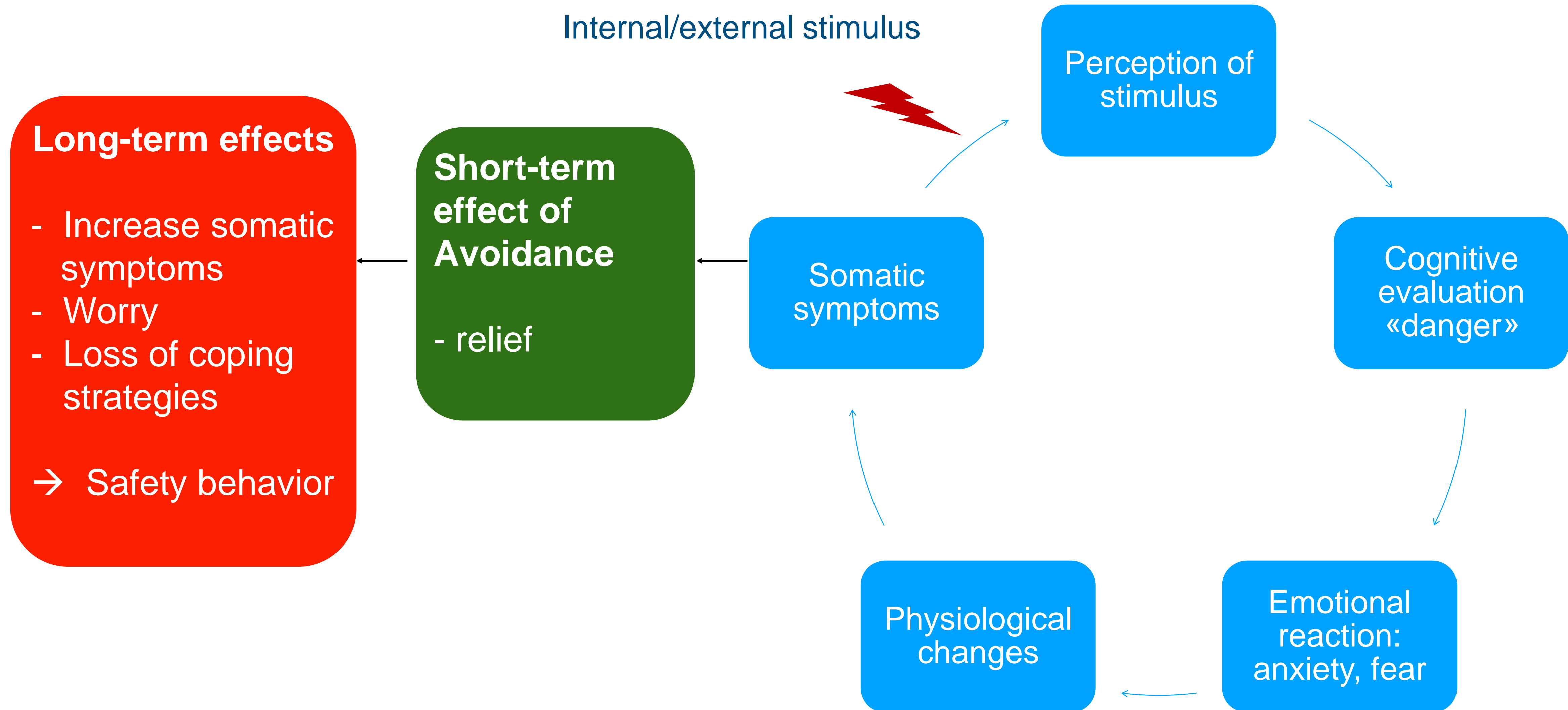
4) In-vivo Exposure

5) Coping-strategies



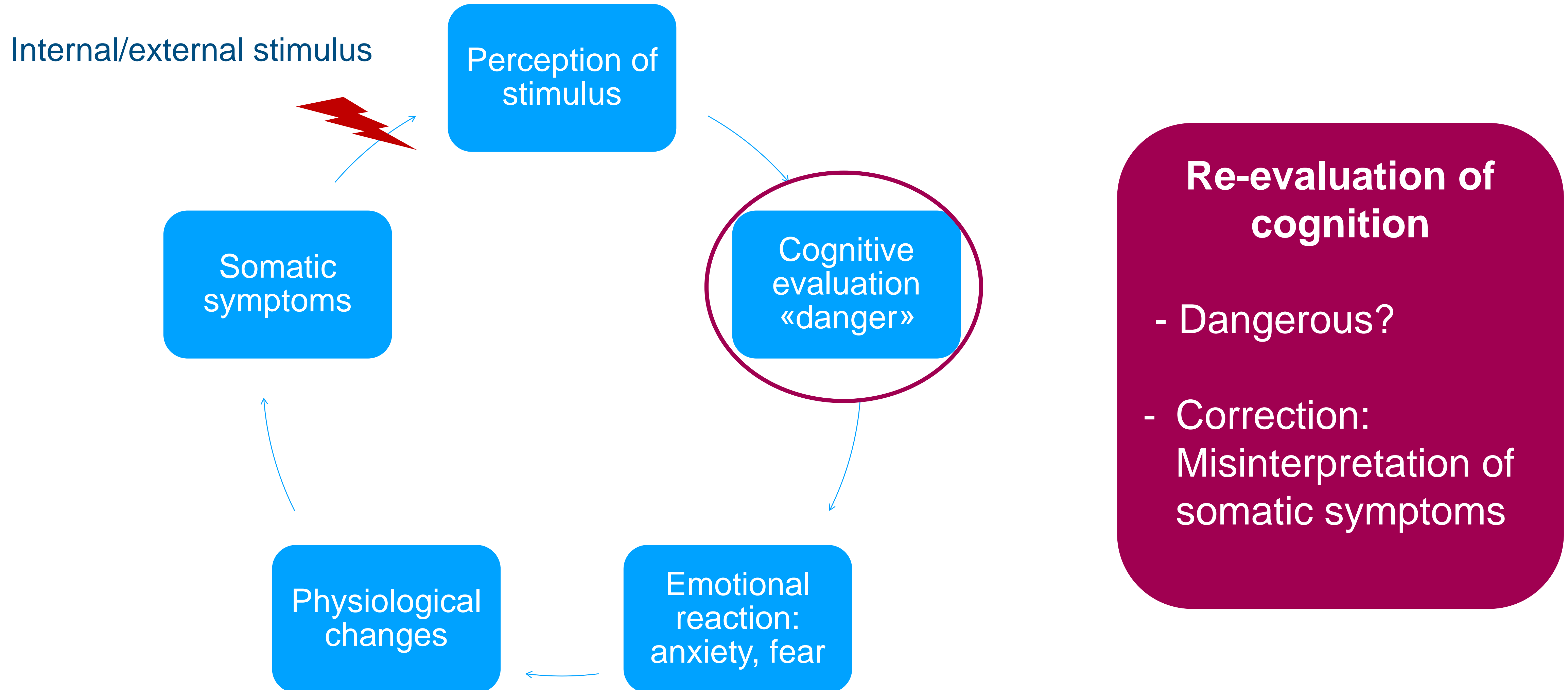
Social Phobia & Panic Disorder

1.) Psychoeducation (Information): Vicious circle of anxiety

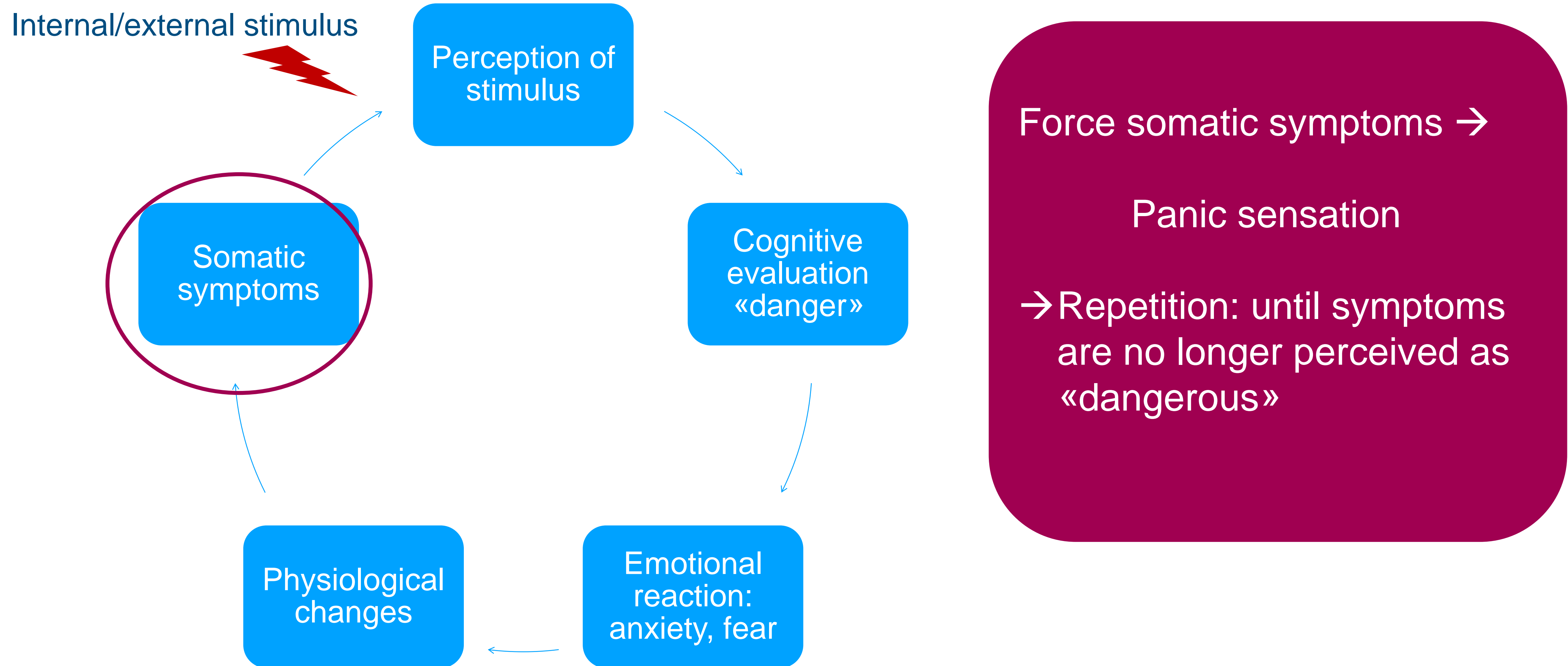


2.) Cognitive restructuring

«uncontrollable» thoughts → associated with physical symptoms



3.) Interoceptive exposure



CBT

4.) In-vivo Exposure

→ Confrontation with situation

12-15 treatment sessions

2 Options:

«Stimulus flooding»

- max. trigger of anxiety symptoms
- task: stay in situation → wait until «habituation»
→ anxiety reaction decreases

«Systematic desensitization» / «Graduated exposure»

- gradually approach: reduction of anxiety symptoms



CBT

5) Coping strategies & emotion regulation

→ Relaxation exercises (PMR), breathing techniques, mindfulness, meditation



Virtual Reality (VR)



Exposure therapy

- Indication: various anxiety disorders
- Advantage: time saving, availability
- Side-effect: cybersickness

CNN

tech

psious



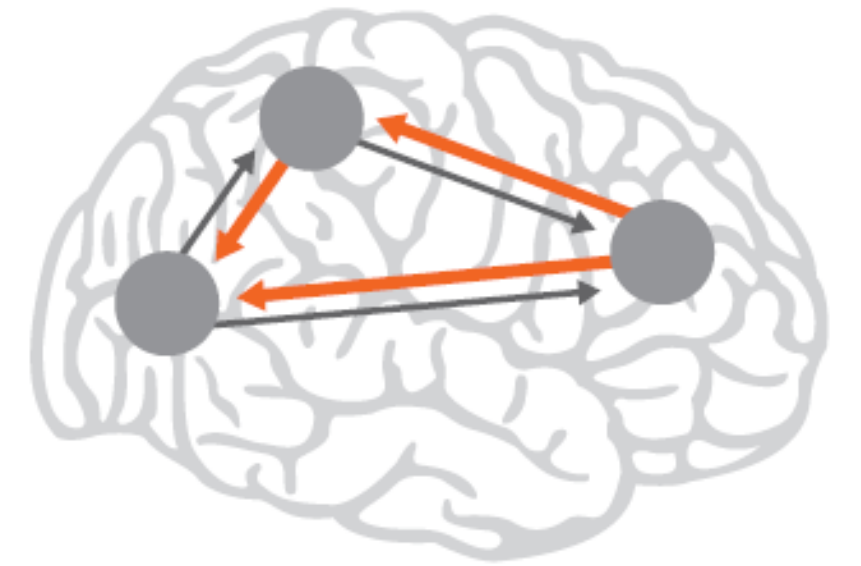
Prognosis

Prognosis & current situation

Anxiety

- ▶ High number of unreported cases
- ▶ Long latency period until final diagnosis
- ▶ 50% of anxiety patients are untreated
- ▶ Chronic progression, associated with comorbidities

Open problems that CP should address



Diagnostics

- Early detection (e.g. high-risk individuals, people with mild symptoms/ personality traits) → prevention strategies
- Identify subgroups
- Prediction of anxiety progression

Treatment

- Prediction of treatment selection
- Prediction of treatment outcome

CP References

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