

Functional abdominal pain in children

- which therapies are evidenced based in complementary medicine and what is helpful in a pediatric practice?

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SGP 2021

Epidemiology



- Pooled Prevalence of 13,5% worldwide (*Rajindrajith S et al., Expert Rev Gastroenterol Hepatol 2018*)¹
- KIGGS study Germany: 20% of children 3-17years old had two or more pain episodes in three months (*Ellert U et al., KIGGS study 2007*)²
- In Switzerland 6% to 13% of children complain about recurrent abdominal pain (*Kinder- und Jugendgesundheitsbericht 2010*)³

Rome IV Criteria (May 2016)

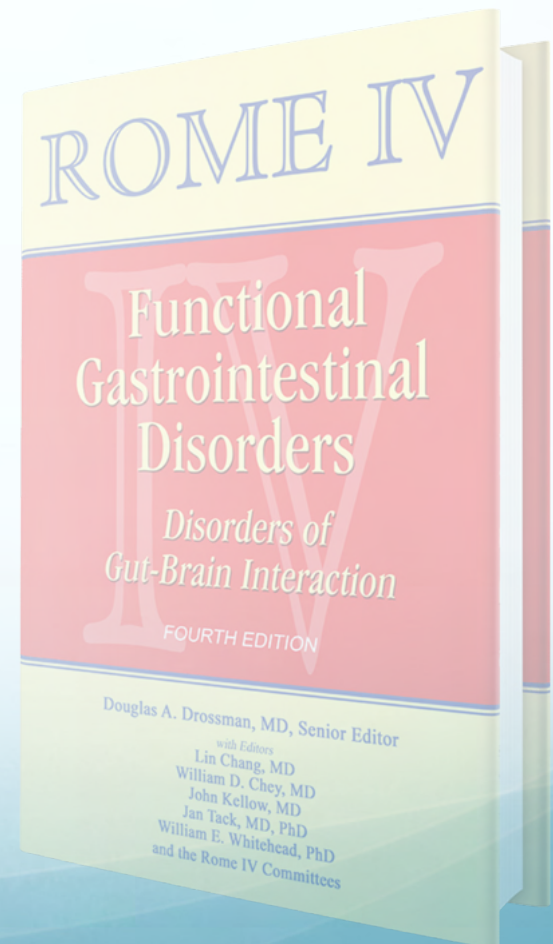
Pediatric Functional Gastrointestinal Disorders

Rome III (2006):

“no evidence for organic disease” in all definitions

Rome IV (2016):

“after appropriate medical evaluation, the symptoms cannot be attributed to another medical condition”



Red Flags

Abdominal Pain in Childhood

- Weight loss (>10%, involuntary)
- Growth deficiency or delayed puberty
- Blood in stool (occult blood), Anemia
- Nocturnal diarrhea and/or pain episodes
- Family history of inflammatory bowel disease
- Fever of unknown origin
- Arthritis
- Pain location other than center of abdomen
- Dysphagia and/or odynophagia

Rome IV Criteria

Functional Nausea and Vomiting Syndromes

- Cyclic vomiting syndrome
- Functional nausea and vomiting
- Rumination Syndrome
- Aerophagia

Functional abdominal pain disorders (Hyams JS et al., 2016)⁴

- **Functional dyspepsia (FD)**
- **Irritable bowel syndrome (IBS)**
- **Abdominal migraine (AM)**
- **Functional abdominal pain (FAP) – Not otherwise specified epidemiology**

Functional Defecation Disorders

- Functional Constipation
- Nonretentive Fecal incontinence

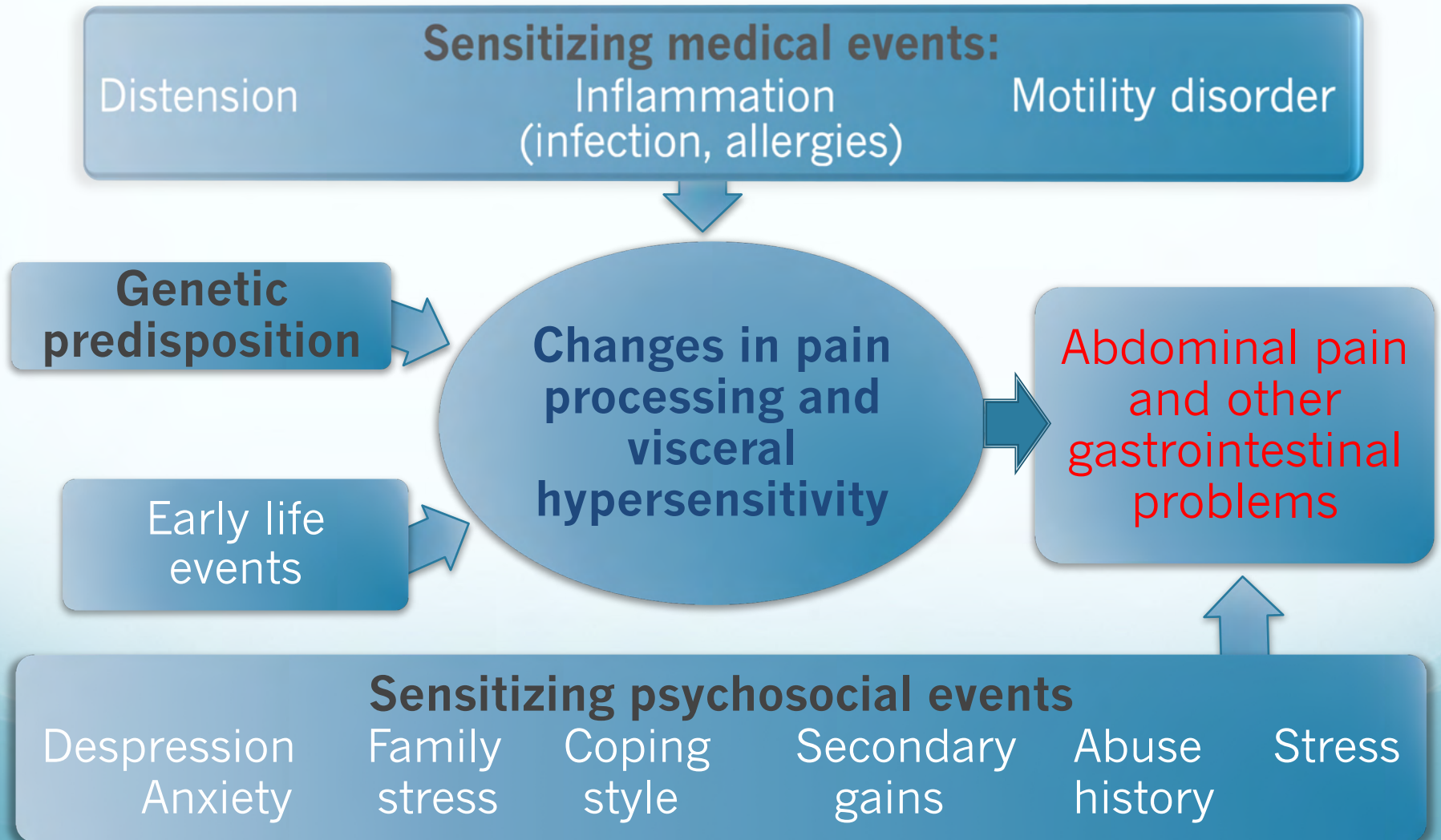
Diagnostic Criteria

(fulfilled for at least 2 months before diagnosis)

	FD	IBS	AM	FAPD
Postprandial fullness + early satiation	Yes			
Epigastric pain or burning – not associated with defecation	Yes			
Abdominal pain at least 4d/month + one or more of: related to defecation/change of stool frequency/change in form of stool		Yes		
Pain does not resolve with resolution of constipation		Yes		
Paroxysmal episodes of intense abdominal pain lasting ≥ 1 hour, interfering with normal activity			Yes	
Episodes separated by weeks to months, stereotypical pattern and symptoms in the individual patient			Yes	
Associated with 2 or more of: anorexia, nausea, vomiting, headache, photophobia, pallor			Yes	
Abdominal pain does not occur solely during physiologic events				Yes
Insufficient criteria for FD, IBS, AM				Yes
After appropriate evaluation symptoms cannot be otherwise explained	Yes	Yes	Yes	Yes

Pathophysiology of functional abdominal pain disorders

(Hyams JS et al., 2016)⁴



Functional Dyspepsia

Conventional Therapeutic Options

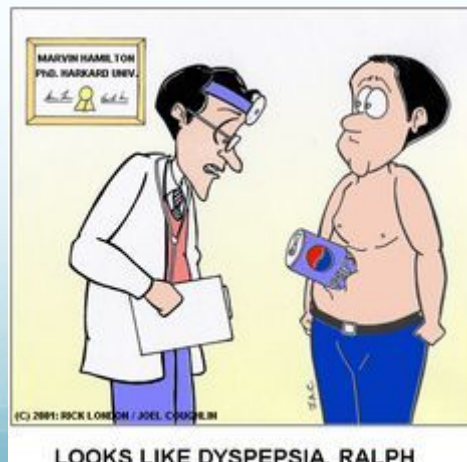
No adequately sized, double-blind, placebo controlled pediatric studies *(Hyams JS et al., 2016)*⁴

- **Avoid:**
 - Foods aggravating symptoms (spicy, fatty, caffeine containing)
 - Nonsteroidal anti-inflammatory agents
- **Offer:**
 - Acid blockade (with histamine receptor antagonists and proton pump inhibitors) if pain is predominant *(Camileri M et al., 2013)*⁵
 - Omeprazole is superior to others (pain relief 53,8%) *(Browne P et al., 2018)*⁶
- Prokinetics can be offered for nausea, bloating, satiety
- Ketotifen if FD and duodenal eosinophilia *(Santucci N, 2020)*⁷

Functional Dyspepsia

Conventional Therapeutic Options

- Take psychological factors into account
- Cyproheptadine is safe and effective for dyspeptic symptoms
(Rodriguez L et al., 2013)⁸
- Gastric electrical stimulation might be a promising option for patients refractory to medical treatment (Lu PL et al., 2013)⁹
- (Low-dose tricyclic antidepressant therapy– no evidence (Cooper T, 2017)¹⁰)



Functional Dyspepsia

CAM

- Dietary modifications
 - Small frequent meals, increase Fiber, Low Carbohydrate Diet, no meals within 3 hours of sleeping helpful (*Pilichiewicz AN et al., 2009*)¹¹
- Acupuncture/Acupressure: no data on children with FD, good data for adults
- Biofeedback (BART: biofeedback-assisted relaxation training) (*Schurman JV et al., 2010*)¹²
- Herbs and herbal formulas
 - Carmenthin[®] (Peppermint oil and caraway oil): positive effects, evidenced based (*Fifi A et al, 2018*)¹³ Study with adults
 - Ginger root: no effect on symptoms!! (*Fifi A et al, 2018*)¹³
 - If combined with artichoke – some effect (*Giacosa A et al., 2015*)¹⁴
 - Licorice root (*Raveendra, KR et al., 2012*)¹⁵
 - Iberogast[®]

Menthacarin[®] - Carmenthin[®]

- Blend of peppermint oil and caraway oil – Menthacarin[®] is the active ingredient of Carmenthin[®]
 - Caraway Oil exerts cholagogic and choloretic effects and inhibits the smooth muscle contraction (Madisch A, 2019)¹⁶
 - Peppermint Oil possess calcium antagonistic properties (comparable to verapamil, nifedipine and diltiazem) and influences the transport activity of the enterocytes in the intestinal lumen by inhibiting their glucose uptake. (Madisch A, 2019)¹⁶

Relaxant effect on gastrointestinal smooth muscle

STW 5 (Iberogast®)



- Blend of 9 herbal extracts: Iberis amara, Angelica, Chamomile, Caraway Fruit, St. Mary's Thistle, Lemon Balm Leaves, Peppermint, Celandine, and Licorice Root (on the market since 1961!)
 - Anti-inflammatory¹⁴, antioxidative properties¹⁷
 - Reduces gastric acid secretion (Wegener T et al., 2006)¹⁷
 - Stimulation of digestive secretions (Saller R et al., 2006)¹⁸
 - Regulation of peristalsis (Pilichiewicz AN, 2007)¹⁹
 - Stimulation of mucus production¹⁵
 - Spasmolytic properties¹⁵ (Ammon HP et al., 2006)²⁰



STW 5 in Children

- **3 Studies with children (IBS, functional dyspepsia)**
(Leichtle K, 1999)²¹, (Gundermann KJ et al., 2010)²² – Review: (Fifi A et al, 2018)¹³, but no RCT
 - Good to very good global treatment effect
 - Symptom score decreased by 76%
- **Adverse events possibly related to STW-5** *(Vinson BR, Radke M, 2011)²³*
 - Nausea, abdominal pain, vomiting
- **Dosage in children:**
 - 3-6 years: 3x 10 gtt (in Germany)
 - 6-12 years: 3x 15 gtt
 - 13 years and older: 3x 20gtt daily

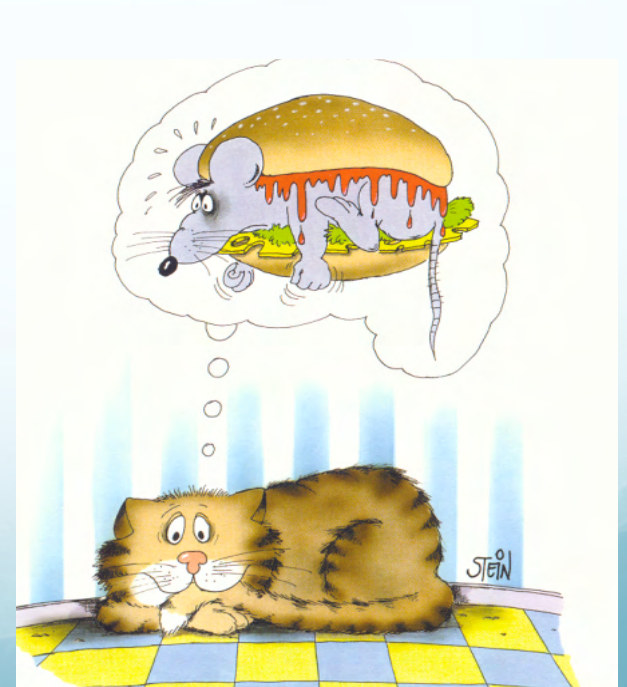


Irritable Bowel Syndrome

Conventional Therapeutic Options

Very few double-blind, randomized treatment trials in pediatric patients with IBS *(Hyams JS et al., 2016)⁴, (Santucci N, 2020)⁷*

- Data supporting the utility of probiotics *(Horvath A et al., 2011)²⁴, (Guandalini S et al., 2010)²⁵*
- Rifaximin in adults helpful *(Rivkin A et al., 2016)²⁶*
- Oral Serum bovine-derived immunoglobuline may be helpful *(Rana A et al, 2017)²⁷, Arrouk R ET AL, 2018)²⁸*
- FODMAP diet: reducing intake of fermentable **o**ligosaccharides, **d**isaccharides, **m**onosaccharides and **p**olyols and fructose-restricted diet *(Pensabene L et al., 2019)²⁹*



Irritable Bowel Syndrome

Conventional Therapeutic Options

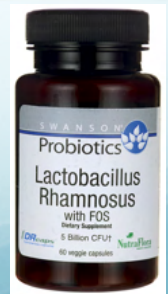
- Cognitive behavioral therapies with the focus on optimizing symptom coping skills *(Huertas-Ceballos A et al., Cochrane Database Syst. Rev: CD003014)³⁰*



Irritable Bowel Syndrome

CAM

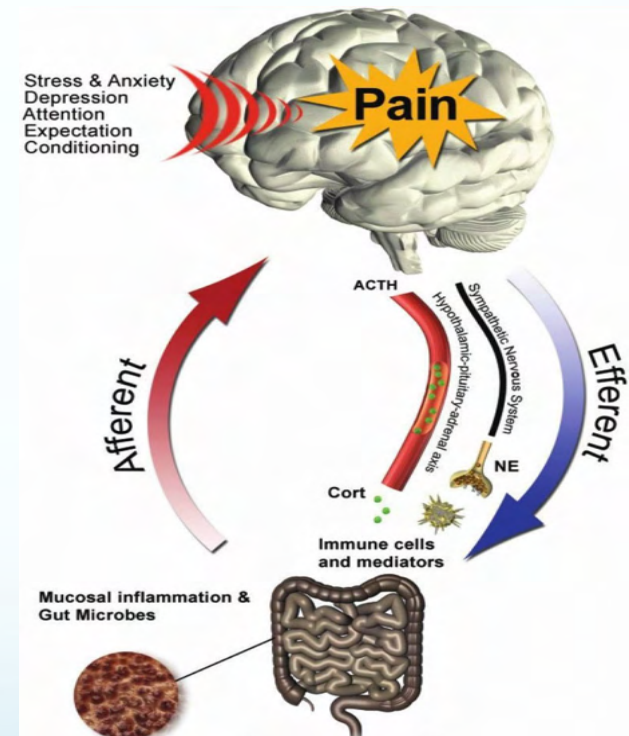
- Peppermint oil –significant differences compared to placebo (*Fifi A et al, 2018*)¹³, (*Anheyer D et al, 2017*)³¹
- Psyllium fiber powder reduces number of pain episodes (103 patients 7-18y) (*Shulman RJ et al., 2016*)³²
- PHGG (partially hydrolyzed guar gum) normalizes bowel movements (over 24 studies) (*Romano C et al., 2013*)³³
- *Lactobacillus reuteri* - more effective than *Lactobacillus rhamnosus* (*Trivic et al., 2021*)³⁴
- **But:** only *Lactobacillus rhamnosus* seems to be effective in children with IBS (*Carrie et al, 2011*)³⁵



Irritable Bowel Syndrome

CAM

- Gut-directed Hypnotherapy is highly effective (*Vlieger AM et al., 2012*)³⁶, (*Gulewitsch M et al, 2013*)³⁷, (*Rutten J et al, 2012*)³⁸, (*Rutten J, Vlieger AM et al, 2017*)³⁹
- Iyengar Yoga (*Korterink JJ et al., 2016*)⁴⁰, (*Evans S, 2018*)⁴¹
- Iberogast[®]
- Diet modification:
 - Reduce gas producing foods
 - Fructose restricted diet (*Pensabene L et al., 2019*)²⁶
 - FODMAP diet (*Pensabene L et al., 2019*)²⁹
(*Shepherd SJ et al., 2013*)⁴²



Gut-directed Hypnotherapy

In the Netherlands Prof. Arine Vlieger developed a treatment program for **home-based hypnotherapy self-exercises** addressing IBS, FAP or FAPS (Rutten J, Vlieger AM et al, 2017)³⁹

The evidence-based program is online available

- www.hypnosis4abdominalpain.com

A group of Swiss pediatricians established a collaboration with Prof. A. Vlieger. The goal is that German speaking children will have access to the excellent online program.

The Swiss group is hoping to get the support of many Swiss gastroenterologists to spread the news across Switzerland as soon as the website is open to the public.

Abdominal Migraine

Conventional Therapeutic Options

The treatment plan is determined by the frequency, severity and impact of the abdominal migraine episodes on the child and family daily life.

- Prophylactic benefit of oral pizotifen (a double-blind, placebo-controlled, crossover trial in 14 children) (*Symon DN et al., 1995*)⁴³
- Prophylaxis with drugs such as amitriptyline (*Catto-Smith AG, Ranuh R, 2003*)⁴⁴, propranolol and cyproheptadine (*Worawattanakul M et al., 1999*)⁴⁵ has been successful

Abdominal Migraine

CAM

?

Functional Abdominal Pain

Not Otherwise Specified Epidemiology

Conventional Therapeutic Options

Most treatment trials for FADPs have combined all disorders together limiting generalizability.

- Mebeverine was not significantly better than placebo in children *(Pourmoghaddas Z et al., 2014)⁴⁶*
- Amitriptyline showed benefits in one study *(Saps M et al., 2009)⁴⁷*, in a large multicenter study it was not *(Bahar RJ et al., 2008)⁴⁸*
- For Citalopram there is a trend towards effectiveness compared to placebo *(Roohafza H et al., 2014)⁴⁹*

Functional Abdominal Pain Not Otherwise Specified Epidemiology CAM

- Hypnotherapy (*Vlieger AM et al., 2012*)⁵⁰ and cognitive behavioral therapy (*Levy RL et al., 2010*)⁵¹ have provided short and long-term benefit
- Percutaneous electrical nerve field stimulation (PENFS) seems to have sustained efficacy in adolescents (*Kovacic K et al, 2017*)⁵² as well as gastric electrical stimulation (GES) in children (*Wo JM, 2016*)⁵³
- Peppermint Oil reduces the duration and severity of abdominal pain (*Asgarshirazi M et al., 2015*)⁵⁴



Functional Abdominal Pain CAM - our practical experience

- Dietary Modifications
- Herbs/Botanicals
- Mind Body Medicine
- TCM/Acupuncture/Acupressure
Good studies in adults, lacking in children



Dietary Modifications, Vitamins/Minerals and more

- Individual dietary modification:
 - e.g.: eliminating cow's milk protein, lactose, fructose; reducing gluten, food additives or histamine liberating foods can be helpful. No convincing evidence, that fibre-based interventions improve pain *(Newlove-Delgado T, et al, 2017)⁵⁵*
- Supplements:
 - Zinc, Magnesium
 - Iron (if Ferritin is low)
 - Vitamin C and B6 (if histamin intolerance)
 - Vitamine B12 (for the nervous system)
 - Coenzym Q10 (for the mitochondrial activity)
 - Omega 3 fatty acids and Vitamin D (against inflammation)
 - L-Glutamin (if leaky gut)

Herbs



- Primary tinctures (eg. from Ceres – 2x 1-2gtt. in water)
 - Angelica (if dyspeptic, bloating, weakness) – esp. if caused by stress
 - Chamomile (if cramps) – anti-inflammatory, spasmolytic, antibacterial
 - Common yarrow (if cramps, no appetite) – spasmolytic, against bloating, anti-inflammatory
 - Gentian (if bloating) – stimulation of the secretion of all digestive juices, appetizing
 - Melissa (if nervous) – spasmolytic, against bloating, antibacterial, virustatic, calmative
 - Dandelion (if chronic, liver-stimulating) – anti-inflammatory, spasmolytic, bile stimulating
- Teas
 - e.g.: Roasted Dandelion Root Tea (*Taraxacum*) – little bitter
- Wraps/Poultices
 - Caraway Oil Poultices (Lauche R et al., 2014)⁵⁶



Mind Body Medicine

- Guided imagery
- Clinical hypnosis
- Relaxation techniques
- Psychotherapy
- Meditation



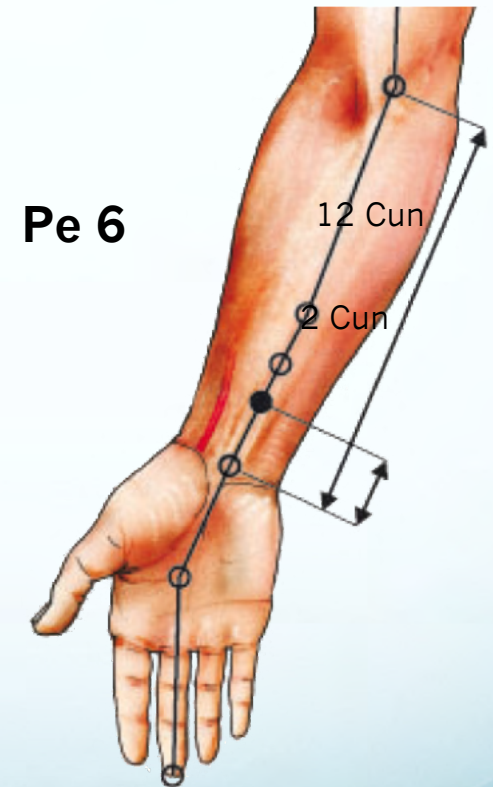
Acupuncture Points useful for nausea and abdominal pain

Pericard 6 – Nausea

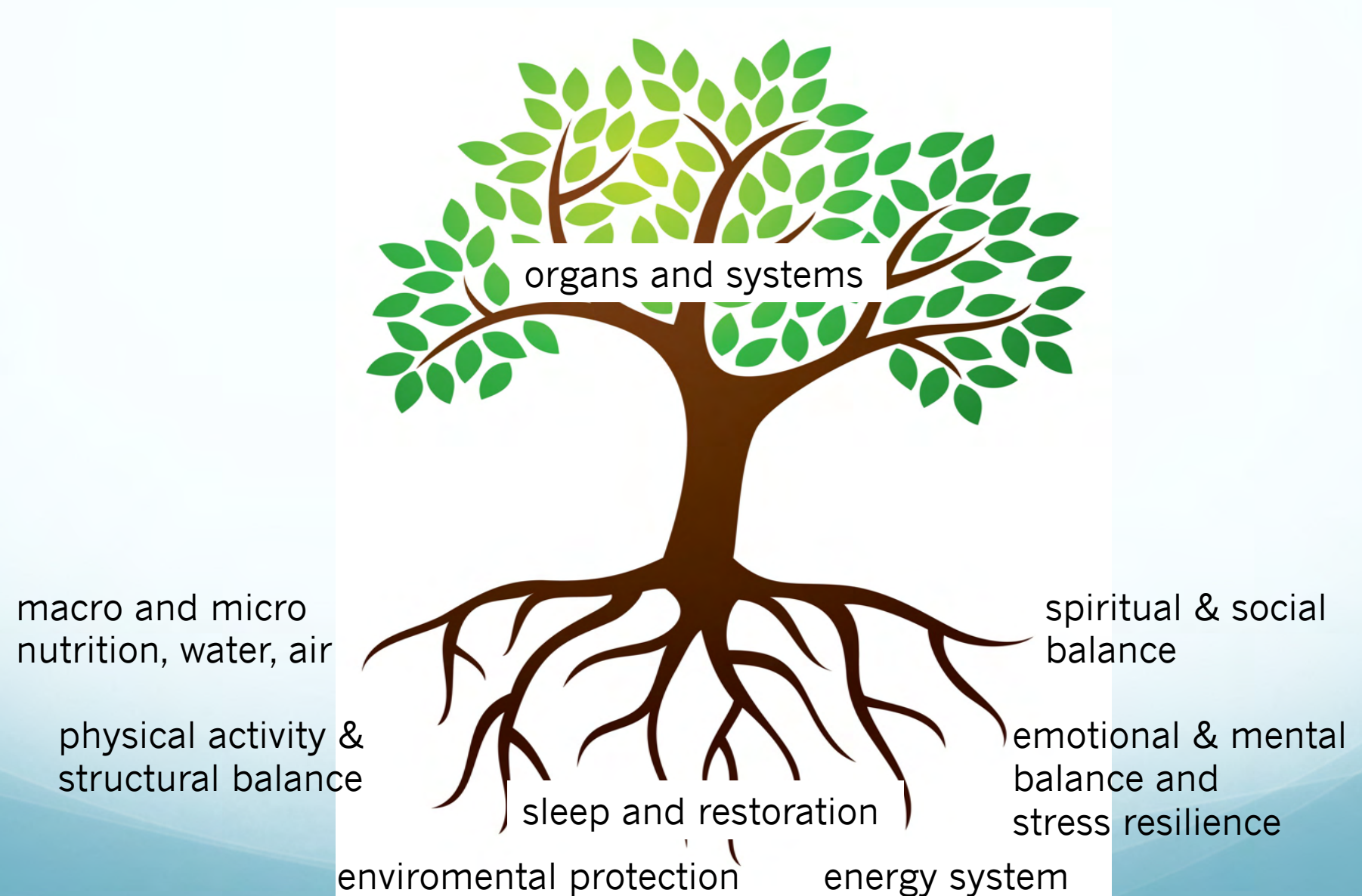
Localisation: 2 Cun proximal of the wrist between the tendon of M. palmaris longus and M. flexor carpi radialis

Other helpful points:

Large Intestine 4, Stomach 25, Stomach 36
Ren 12, Spleen 6, Liver 3



Prevention is the best Intervention



Contact



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