

72°

CONGRESSO NAZIONALE FIMMG - METIS
MEDICINA DI FAMIGLIA: CAMBIARE PER MANTENERE I PROPRI VALORI



PERCORSI SIMPeSV PER UN
AMBULATORIO DEGLI STILI DI VITA:

Terapia degli IBS take home message

**LM Donini, D Livadiotti,
GP Reina, F Borgomastro**

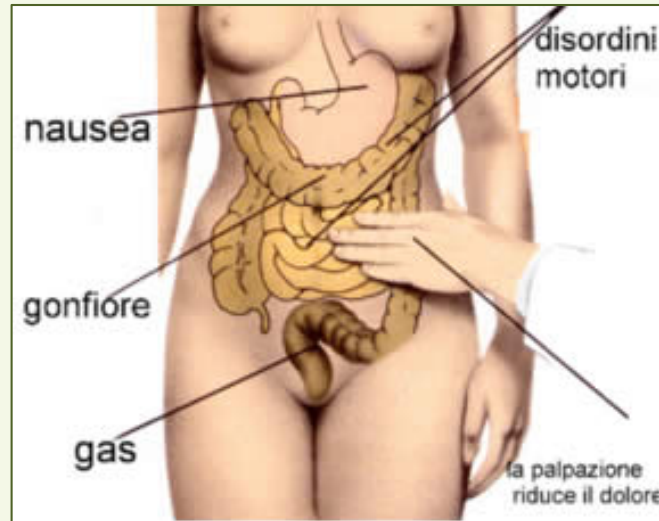
SIMP
eSV

Società Italiana
di Medicina di Prevenzione
e degli Stili di Vita

3/8 Ottobre 2016

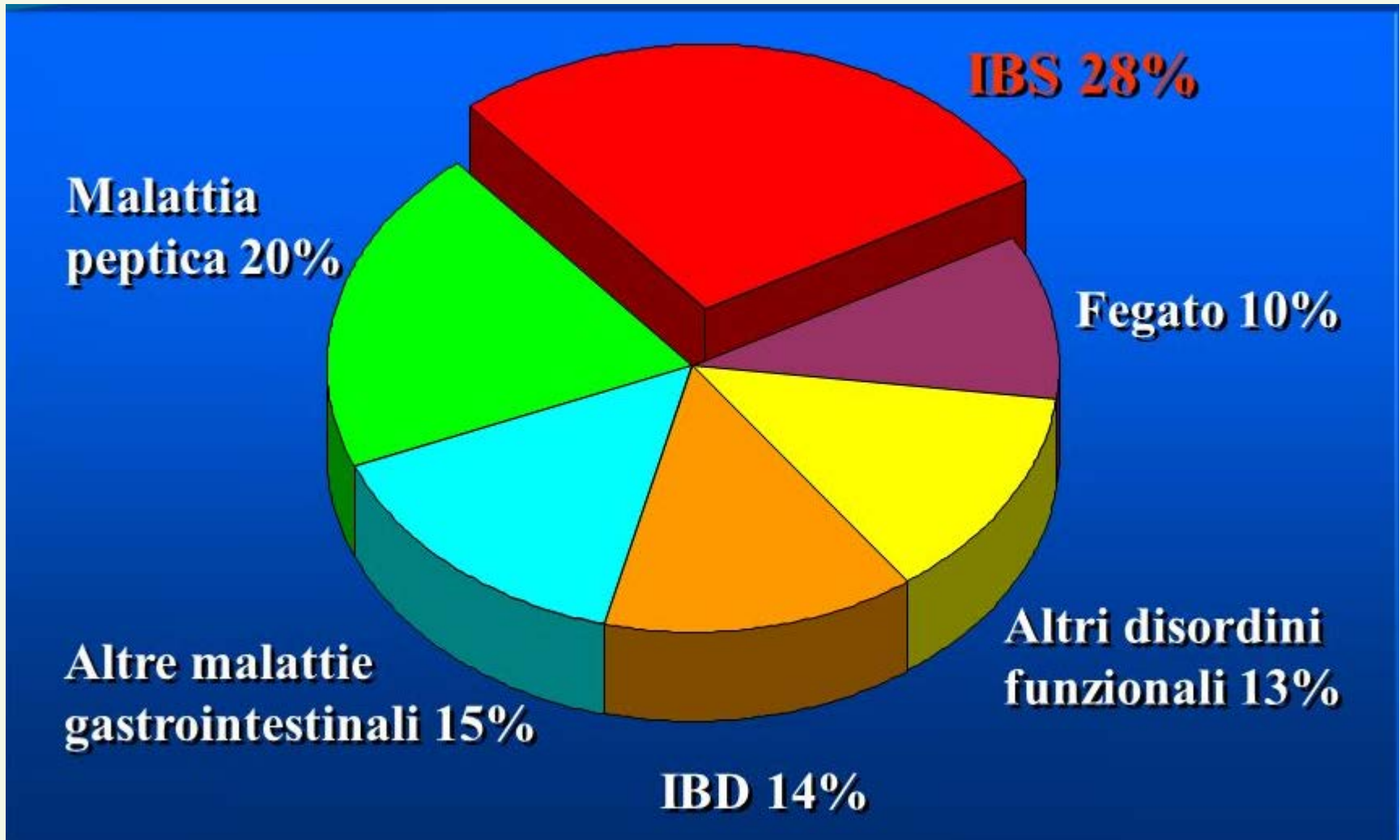
Complesso Chia Laguna
Domus de Maria (CA)

DISORDINI FUNZIONALI GASTROINTESTINALI



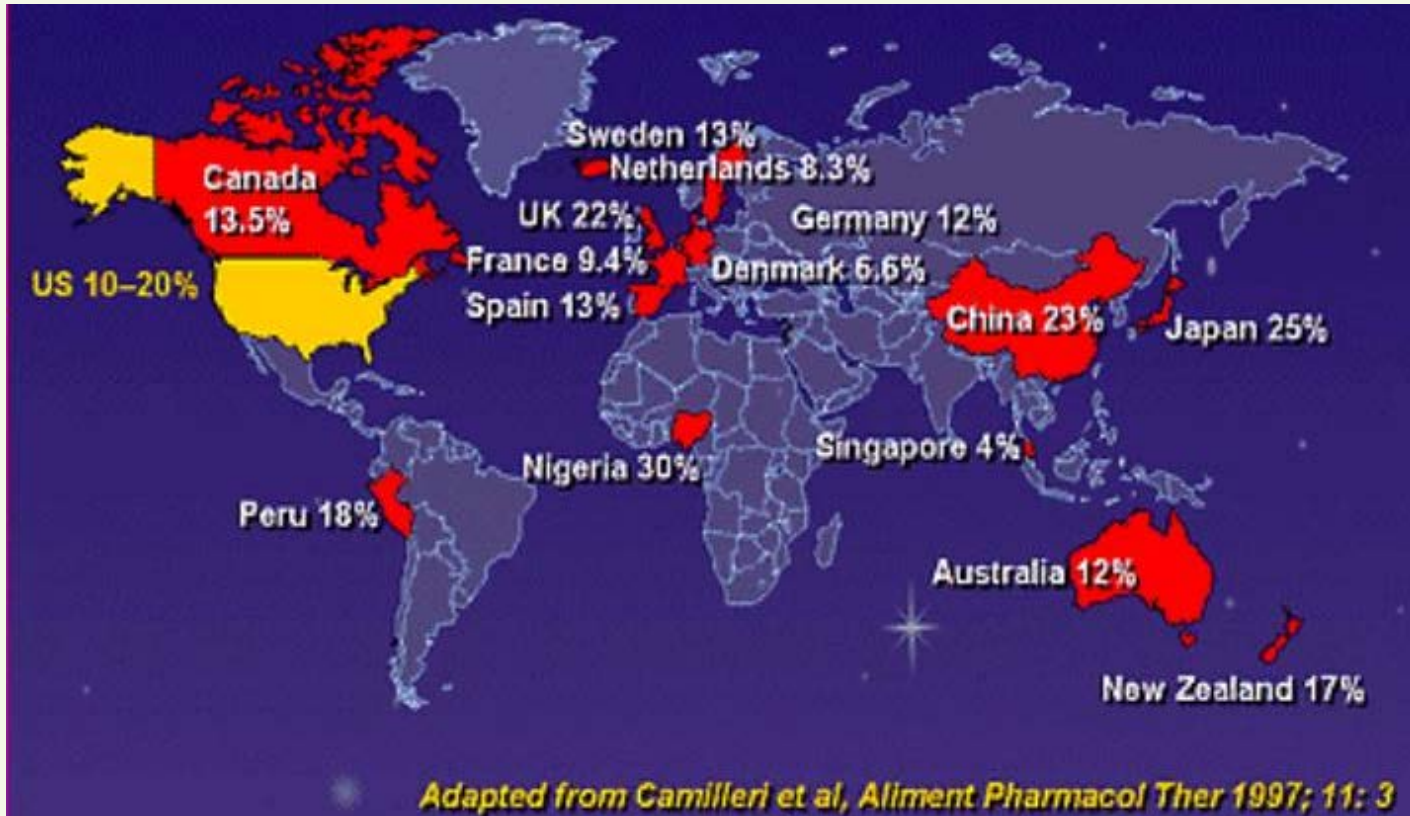
I disturbi funzionali gastrointestinali sono definiti come una variabile combinazione di sintomi gastrointestinali cronici o ricorrenti non spiegati da chiare anomalie organiche, strutturali o biochimiche





E' il disturbo GI più frequente



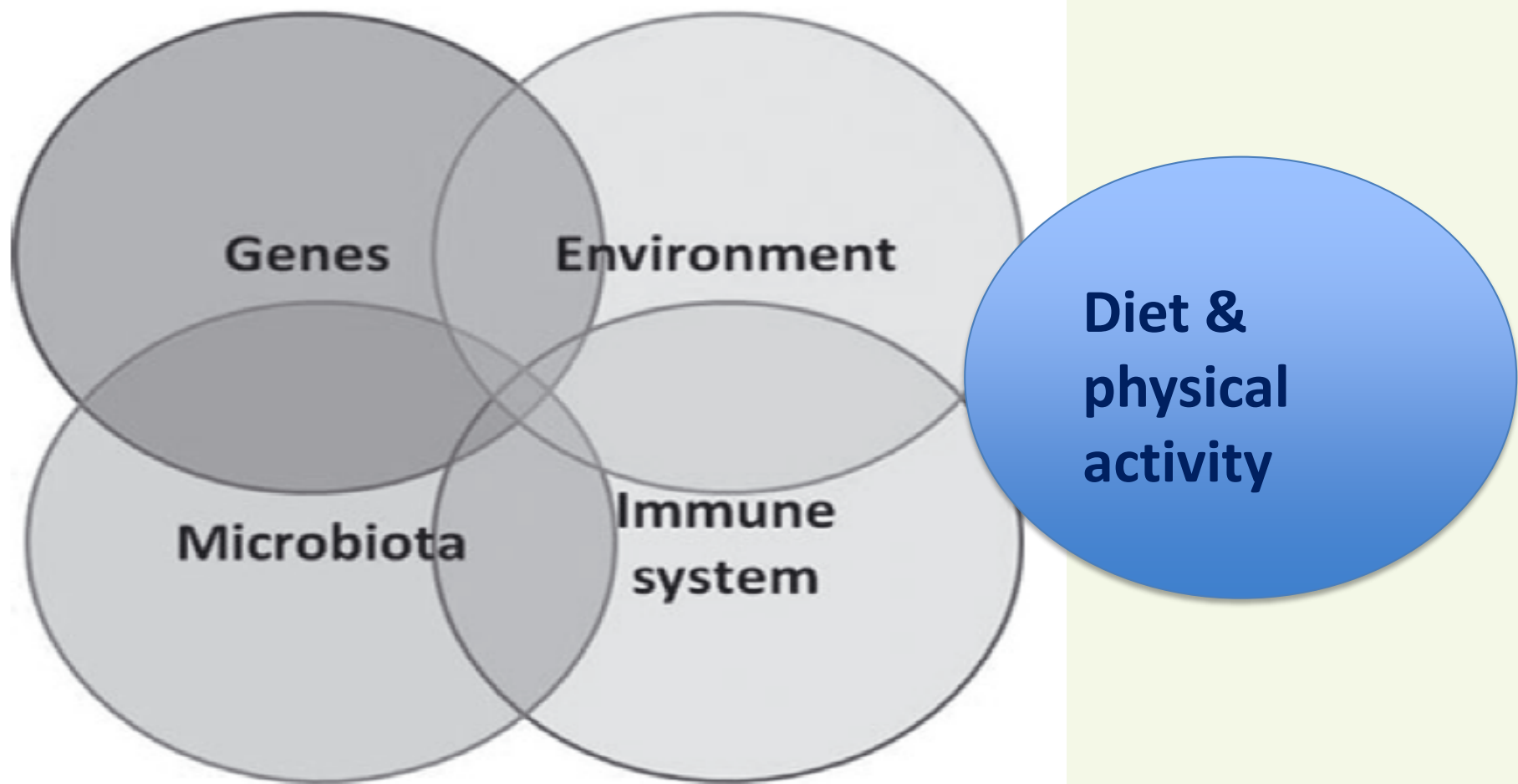


- Prevalenza nei paesi industrializzati 15-20%
- Rapporto M/F 1:2
- Più frequente nei giovani adulti (<45 anni)

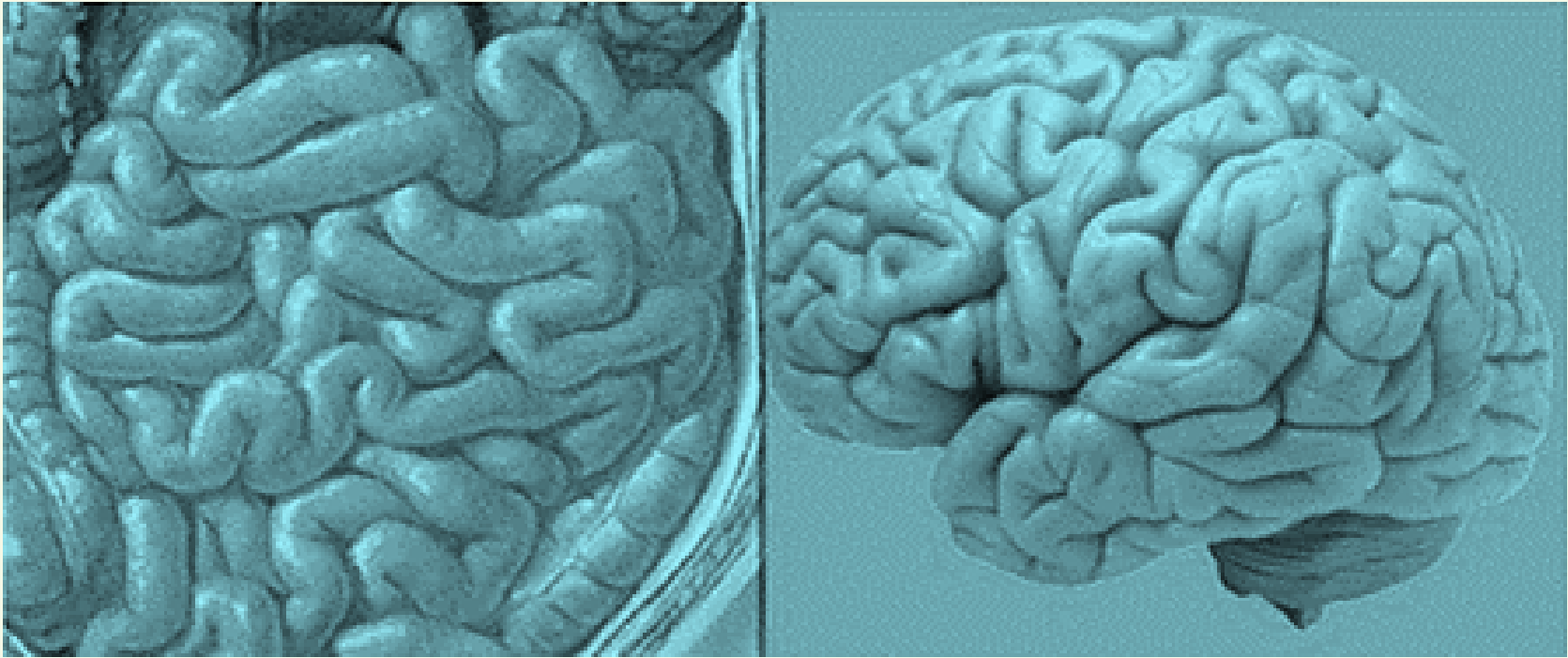
Role of nutrition and microbiota in susceptibility to inflammatory bowel diseases

Liljana Gentschew^{1,2} and Lynnette R. Ferguson^{1,2}

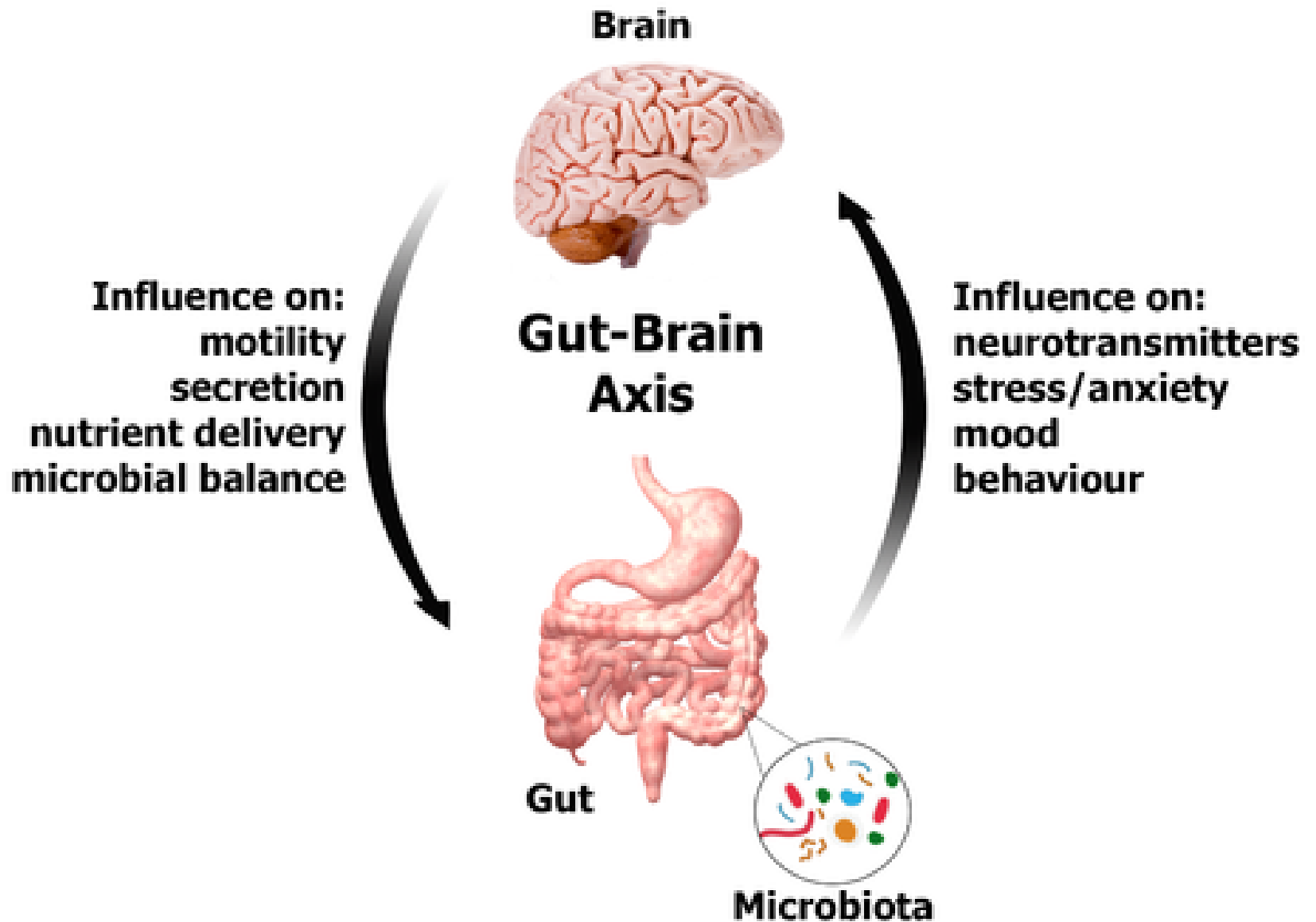
Mol. Nutr. Food Res. 2012, 56, 524–535



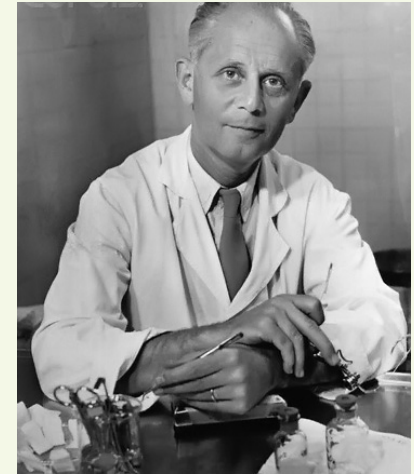
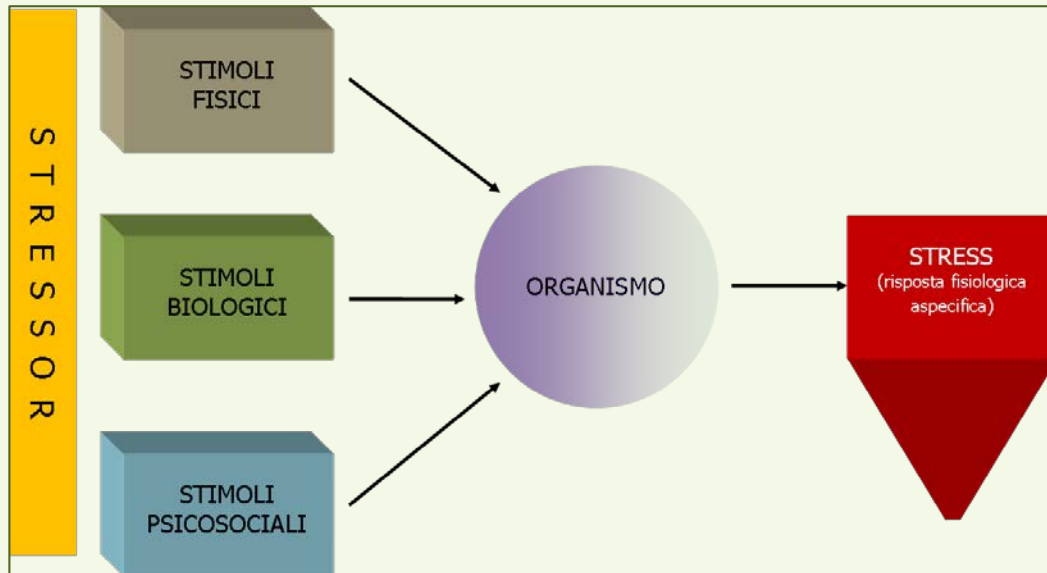
IL «SECONDO CERVELLO»



“Sappiamo che, per quanto il concetto possa apparire inadeguato, il sistema gastroenterico è dotato di un cervello. Lo sgradevole intestino è più intellettuale del cuore e potrebbe avere una capacità “emozionale” superiore. È il solo organo a contenere un sistema nervoso intrinseco in grado di mediare i riflessi in completa assenza di input dal cervello o dal midollo spinale.”



DEFINIZIONE DI STRESS

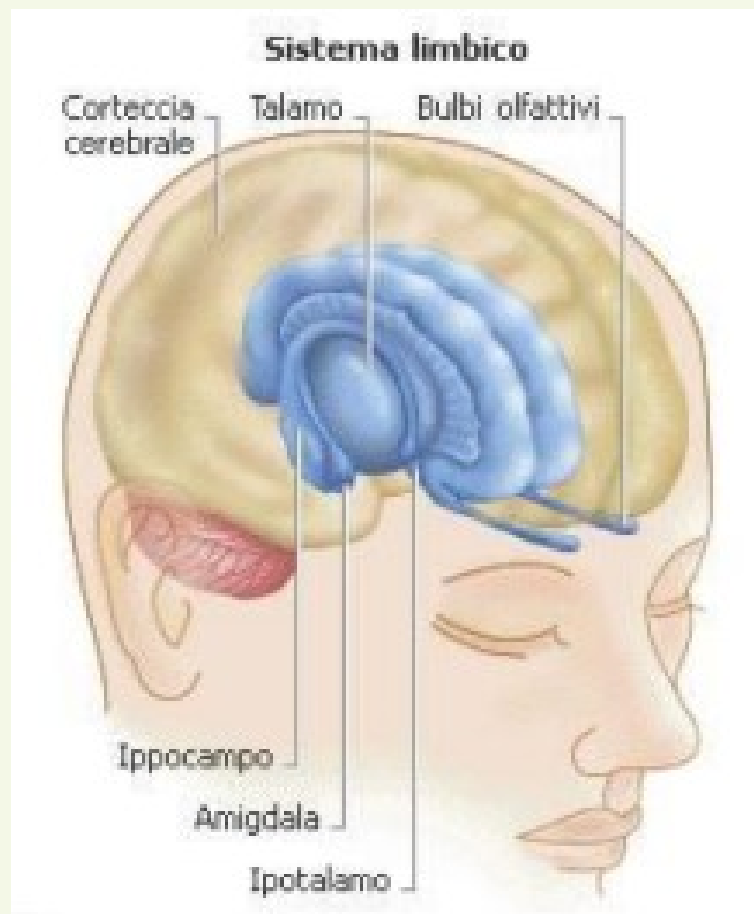


Hans Selye
1907-1982

“risposta strategica dell’organismo nell’adattarsi a qualunque esigenza, sia fisiologica che psicologica, cui venga sottoposto. In altre parole, è la risposta aspecifica dell’organismo a ogni richiesta effettuata su di esso.”

REAZIONE DA STRESS

D Livadiotti

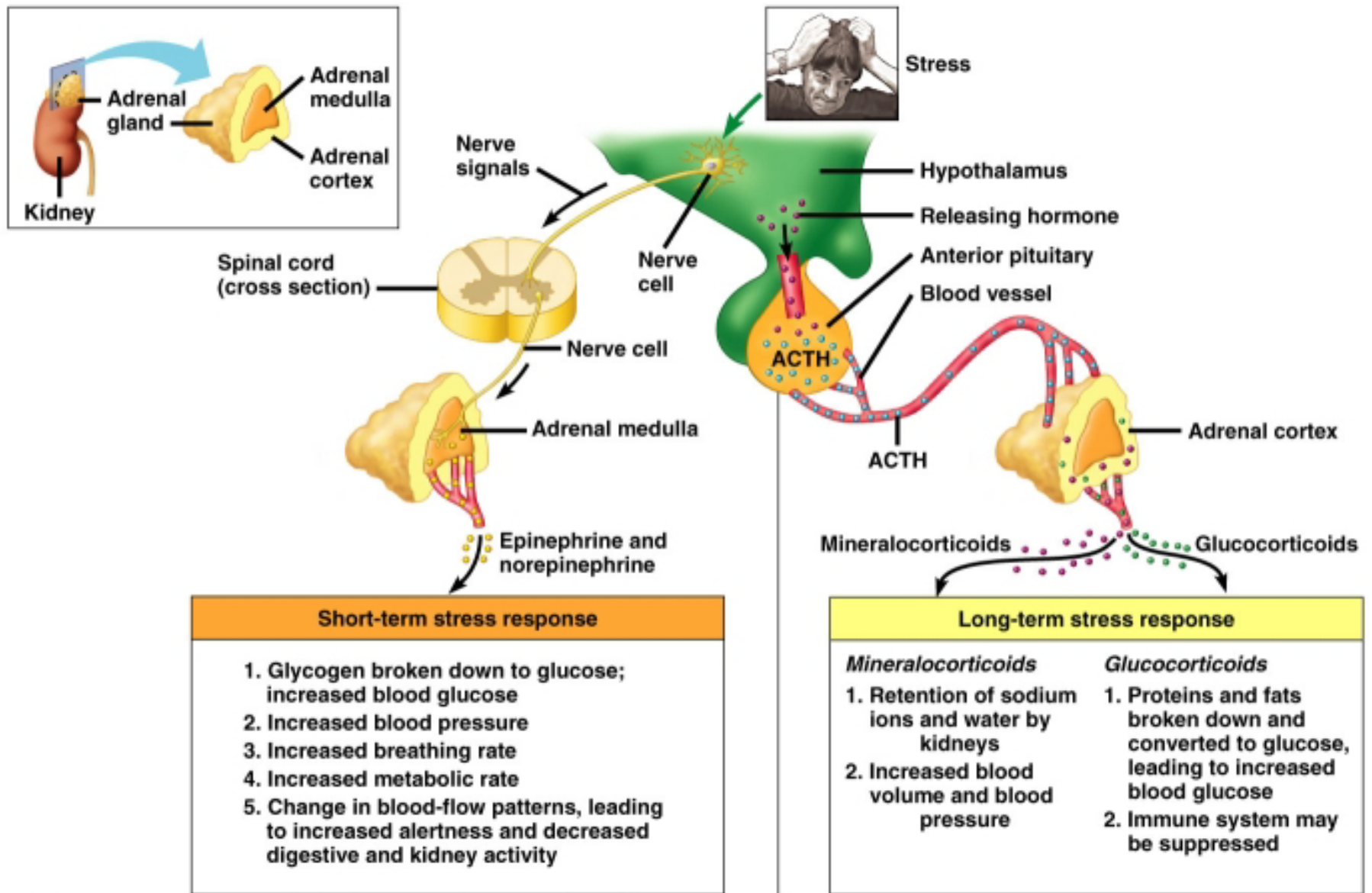


Gli stimoli stressanti captati dal nostro sistema percettivo vengono condotti a livello del talamo; i nuclei talamici elaborano gli stimoli sensitivi e li trasmettono all'amigdala. L'amigdala comunica con l'ipotalamo il cui nucleo paraventricolare libera CRH, il fattore di rilascio della corticotropina, che attiva due diverse vie

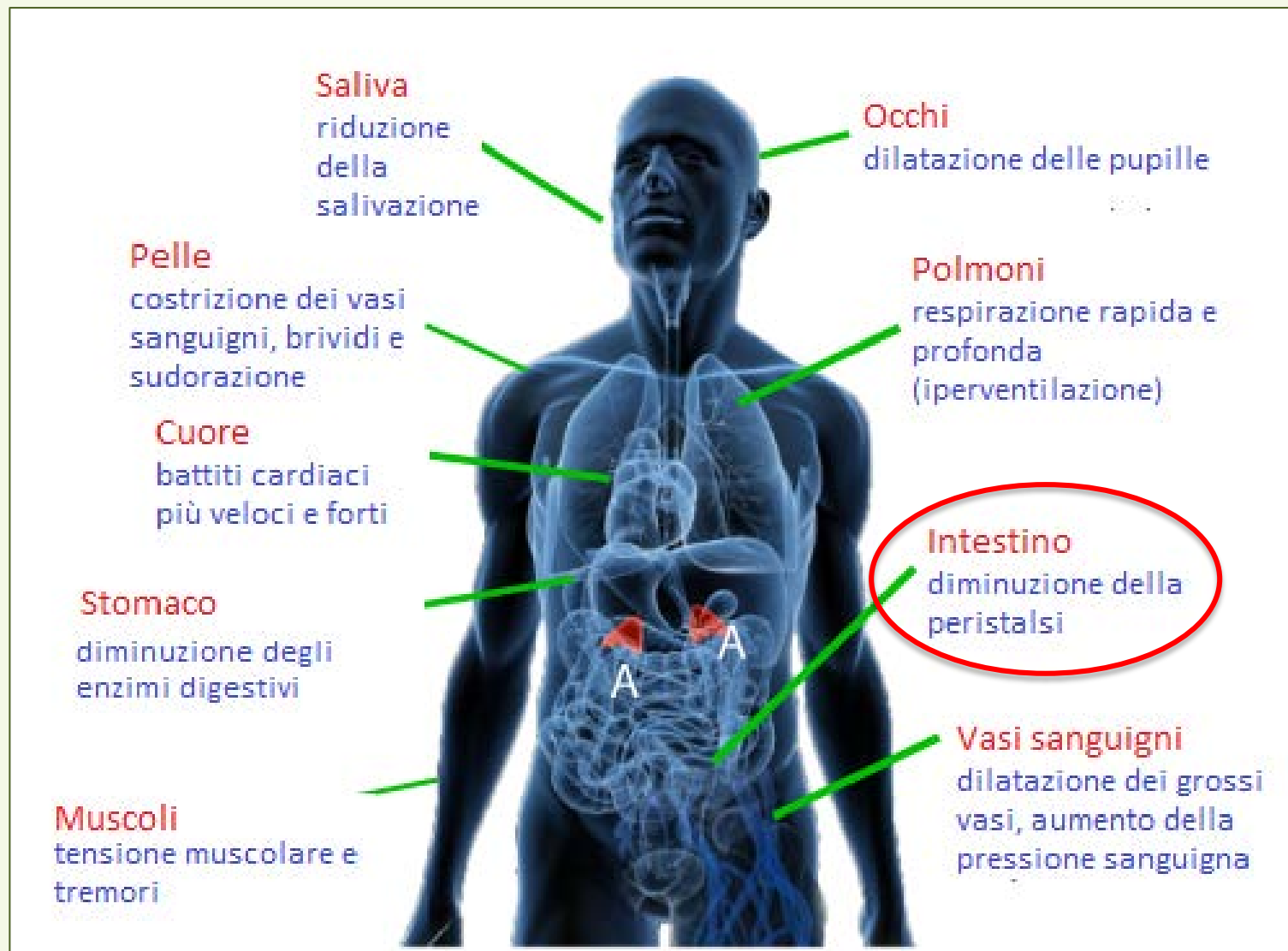


LE DUE VIE DELLO STRESS

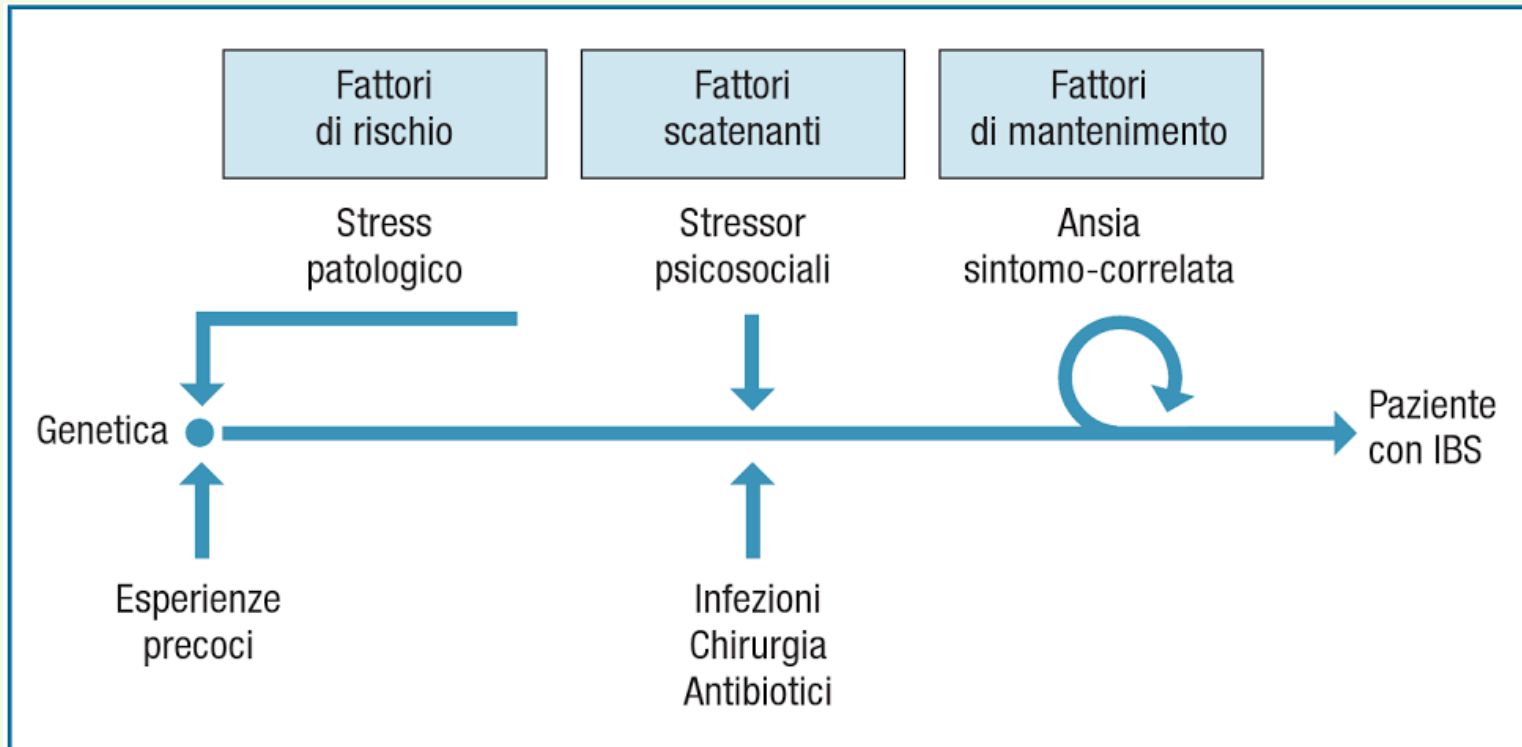
D Livadiotti

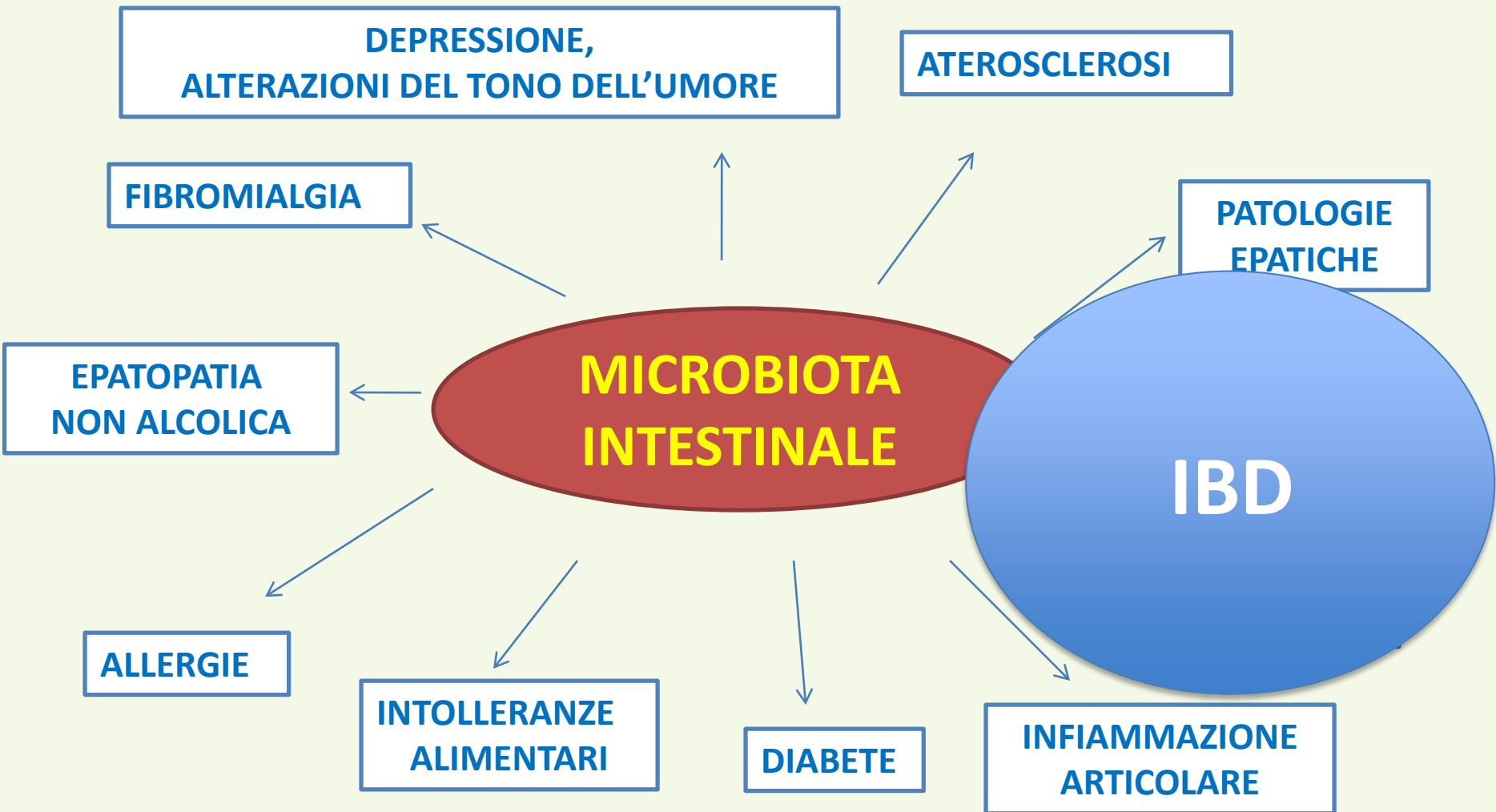


RISPOSTA «FIGHT OR FLIGHT»

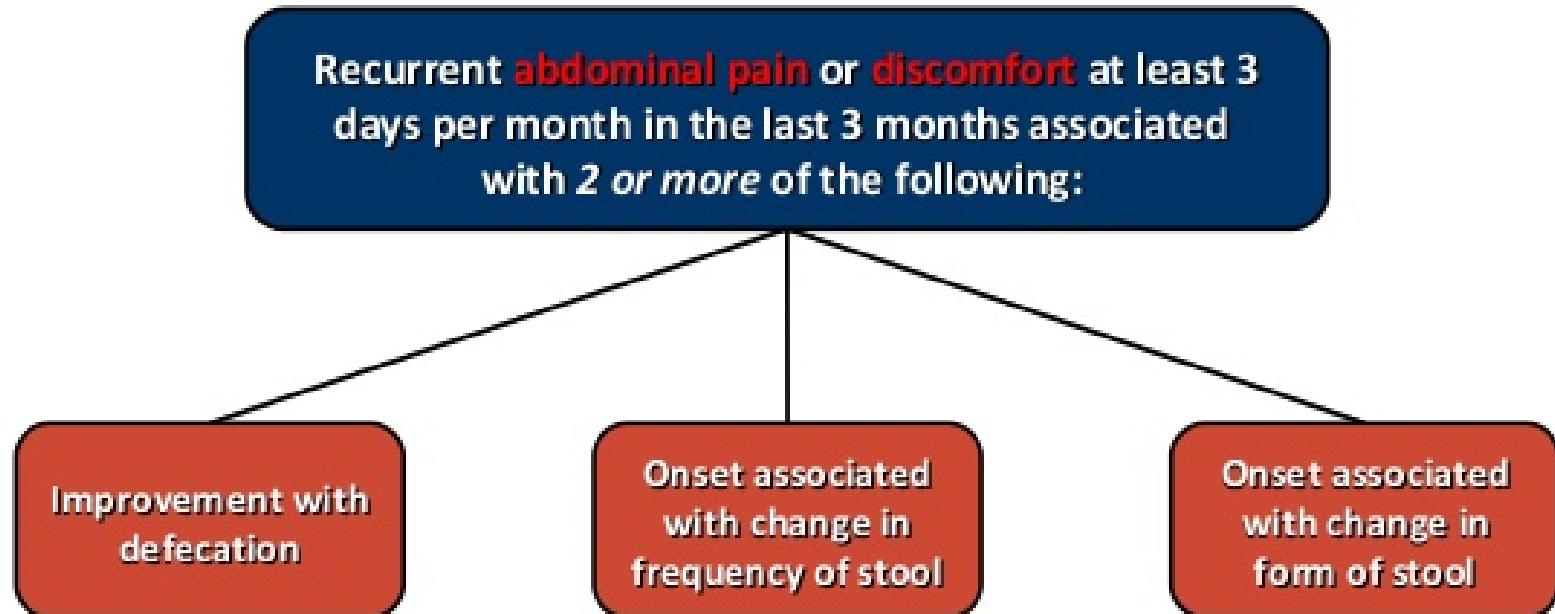


RUOLO DELLO STRESS NELLO SVILUPPO DEI SINTOMI DA IBS





Rome III Criteria* for IBS



*Criteria fulfilled for the last 3 months with symptom onset at least 6 months before diagnosis

Longstreth et al., Gastroenterology 2006;130:1480-91



Leading Gastrointestinal Symptoms Prompting in Outpatient Clinic Visit

D Livadiotti

Gastroenterology

Symptom	Estimated visits
Abdominal pain	15,863,956
Diarrhea	4,236,051
Constipation	3,175,842
Vomiting	2,861,790
Nausea	2,814,364
Heartburn and indigestion	1,982,517
Rectal bleeding	1,702,331
Other GI symptoms, unspecified	1,357,602
Dysphagia	1,148,041
Gastrointestinal bleeding	1,073,771
Appetite decrease	725,705
Bloating and distention	699,928

Peery A: *Burden of Gastrointestinal Disease in the United States: 2012 Update*
Gastroenterology Volume 143, Issue 5, Pages 1179-1187.e3(November 2012)



TEST DI LABORATORIO

(da fare nel sospetto di IBS)



- **Esame emocromocitometrico** (per escludere anemia)
- **VES, PCR** (per escludere IBD)
- **Transglutaminasi** (per escludere celiachia → alta sensibilità e specificità)



Questi esami hanno limitate prove di utilità clinica, ma possono essere comunque di supporto alla diagnosi



DA NON FARE

- Colonscopia
- Sangue occulto
- Ecografia
- Coprocoltura
- Breath test
- Funzionalità tiroidea



Non ci sono sufficienti prove di efficacia per usare questi test di routine nel caso di pazienti che rispondono ai criteri positivi e **che non abbiano alcuna RED FLAG**



RED FLAGS

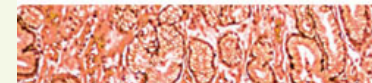


- **risveglio notturno provocato dai disturbi addominali**
- **cambiamento delle abitudini dell'alvo che persiste da 6 o più di settimane**
- **febbre**
- **perdita di peso**
- **presenza di sangue nelle feci**
- **anemia**
- **anamnesi familiare positiva per IBD o neoplasie**



Dietary management of IBD—insights and advice

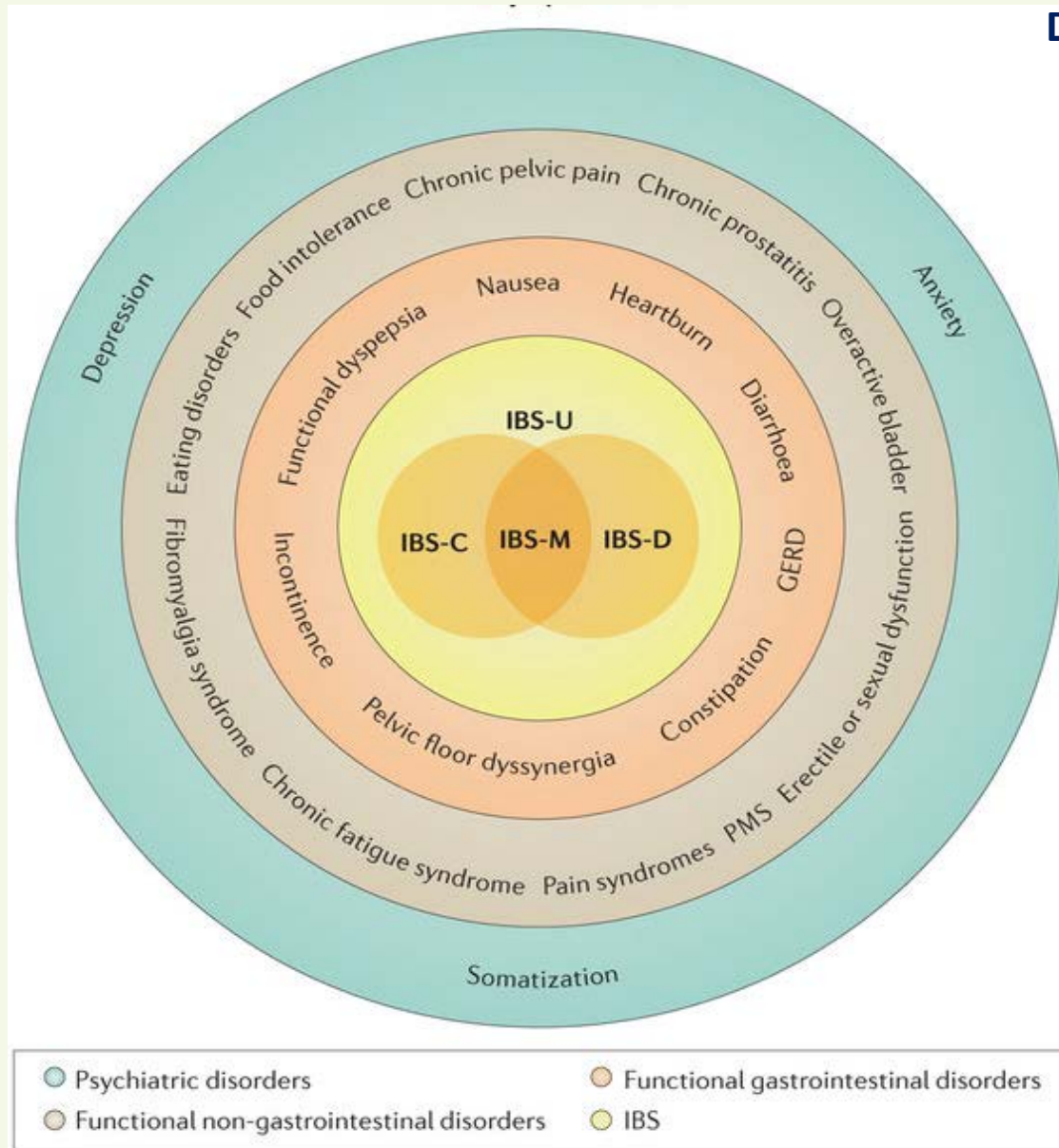
Nat. Rev. Gastroenterol. Hepatol. **12**, 133–146 (2015);



Emma P. Halmos and Peter R. Gibson

Table 3 | Key micronutrients commonly at risk of deficiency in patients with IBD

Micronutrient	At-risk individuals	Method of detection	Food sources	Preferred way of repletion	Common consequences of deficiency
Iron ¹³⁷	Those with active disease; vegetarians and vegans; pre-menopausal women	Serum ferritin levels, transferrin saturation, transferrin receptor levels	Red meat; offal	Intravenous infusion (especially in active disease due to impaired absorption); oral supplementation (less tolerated, might exacerbate intestinal inflammation)	Anaemia, fatigue, weakness, brittle nails
Vitamin D ⁸⁶	Dark-skinned patients; those with decreased exposure to UV rays	Serum concentrations of 25(OH) vitamin D	Limited amount in fortified foods (e.g. margarine, milk)	Oral supplementation; sun exposure	Disturbed calcium homeostasis and bone health; possible enhancement of inflammatory activity
Vitamin B ₁₂ ¹³⁸	Vegetarians and vegans; ileal disease or resection	Serum concentrations of vitamin B ₁₂ , holocobalamin, methylmalonic acid levels when uncertainty	Animal-based foods	Intramuscular injection; oral supplements if absorption normal	Anaemia, fatigue, neurological effects
Zinc ¹³⁹	Vegetarians and vegans; chronic diarrhoea	Plasma concentration (insensitive indicator of decreased zinc stores)	Meat; fortified cereals	Oral supplementation	Impaired healing, disturbed smell and taste, delayed growth in children
Folate ¹⁴⁰	Those on restrictive or elimination diets; sulfasalazine therapy	Serum folate levels	Whole grains; leafy-green vegetables; fortified cereals	Oral supplementation	Anaemia, fatigue
Calcium ¹⁴¹	Restriction of dairy	Serum calcium levels; correction for low albumin	Dairy; calcium-fortified dairy alternatives	Oral supplementation	Decreased bone density
Magnesium ¹⁴²	Chronic or severe acute diarrhoea	Serum magnesium levels	Leafy-green vegetables; soybean	Oral supplementation (osmotic effect might induce diarrhoea); intravenous	Disturbed bone health, muscular cramps, fatigue



Whitehead, W. E. Comorbidity in irritable bowel syndrome. *Am. J. Gastroenterol.* 102, 2767–2776 (2007)



Environmental Factors in the Relapse and Recurrence of Inflammatory Bowel Disease: A Review of the Literature

Thomas D. Martin · Simon S. M. Chan · Andrew R. Hart

Exposure	State of the evidence	What needs to be done?
Smoking	Plausible biological mechanisms including decreased blood vessel patency and increased thrombotic tendency. Clinical data report that smoking increases the risk of relapses of CD, but reduces that of UC	Clarify the underlying biological mechanisms to support the consistent observational data
NSAIDs	Plausible biological mechanisms involving increased intestinal permeability and altered production. Conflicting epidemiological data reporting positive or no associations	Cohort studies comparing relapse rates in patients with IBD according to prior NSAID use, adjusting for all covariates, including maintenance therapies
Estrogen-containing medications	Possible effects in increasing the thrombotic tendency. For the OCP, studies document positive, or no, associations. For HRT, data showing inverse or no associations	Detailed prospective studies of patients investigating CD and UC individually, the varying clinical scenarios and the dose and duration of estrogen use



IBD inflammatory bowel disease, CD Crohn's disease, UC ulcerative colitis, NSAID nonsteroidal anti-inflammatory drugs, HRT hormone replacement therapy



Environmental Factors in the Relapse and Recurrence of Inflammatory Bowel Disease: A Review of the Literature

Thomas D. Martin · Simon S. M. Chan · Andrew R. Hart

Exposure	State of the evidence	What needs to be done?
Antibiotics	Plausible mechanisms involving antibiotics inducing changes in the proportions of pathogenic and commensal gut bacteria. Epidemiological work for CD documenting inverse associations between general antibiotic use and relapse, but not for UC	Clarification of the mechanisms of individual microorganisms in the pathogenesis of relapse. Prospective cohort studies measuring antibiotics, including their dose and duration of use for different clinical manifestations of IBD. Importantly, consistency is required between the mechanistic and epidemiological data
Stress	Mechanisms unknown, although possible effects on decreasing mucous secretion and increasing gut permeability. Most observational work shows positive associations between stress and relapse, but no proven beneficial psychological interventions	Assessment of psychological interventions, in randomized controlled clinical trials, to lower stress and reduce relapse rates

IBD inflammatory bowel disease, *CD* Crohn's disease, *UC* ulcerative colitis, *NSAID* nonsteroidal anti-inflammatory drugs, *HRT* hormone replacement therapy





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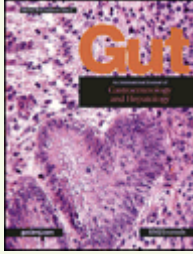
Exposure	State of the evidence	What needs to be done?
Diet	Laboratory and observational work that excess dietary sulfur may precipitate relapse	Detailed cohort studies in patients with IBD recording their dietary intake and correlating with clinical relapse. Randomized controlled clinical trials of dietary interventions, including a low-sulfur diet in UC
Pollution	Laboratory work reports detrimental effects of air pollutants on the intestinal mucosa. Ecological work reporting associations with density of air pollutants and IBD hospitalizations	Analytical epidemiological studies comparing exposure to pollutants and risk of clinical relapse

- Dietary sulfur is present as **sulfated AA, inorganic sulfur and a preservative food additive**
- Sulfur may be **toxic to human colonocytes** following its metabolism by colonic bacteria to hydrogen sulfide (H₂S).
- Furthermore, sulfides inhibited the **butyrate-dependent energy metabolism of colonocytes**, which may have a pathophysiological effect on such cells.

IBD inflammatory bowel disease, *CD* Crohn's disease, *UC* ulcerative colitis, *NSAID* nonsteroidal anti-inflammatory drugs, *HRT* hormone replacement therapy

Geographical variability and environmental risk factors in inflammatory bowel disease

Siew C Ng,¹ Charles N Bernstein,² Morten H Vatn,³ Peter Laszlo Lakatos,⁴ Edward V Loftus Jr,⁵ Curt Tysk,⁶ Colm O'Morain,⁷ Bjorn Moum,⁸ Jean-Frédéric Colombel,⁹ on behalf of the Epidemiology and Natural History Task Force of the International Organization of Inflammatory Bowel Disease (IOIBD)



Gut 2013;**62**:630–649. doi:10.1136/gutjnl-2012-303661

- Accumulating data suggest that the increased frequency of IBD in the industrialised parts of the world is mainly explained by **environmental risk factors**.
- Of all factors identified, **not a single one** alone may, up to now, totally explain the worldwide epidemiology of IBD.
- Some issues studied may not be factors in themselves but rather **markers** for other unidentified influences.
- It is highly likely that **genetic influences** critically determine the role that individual environmental factors may play in triggering disease.
- It is also possible that the strength of influence by risk factors or lack of protective factors in a society is different, depending **on geography or urbanisation**.



Dietary management of IBD—insights and advice

Nat. Rev. Gastroenterol. Hepatol. 12, 133–146 (2015);

Emma P. Halmos and Peter R. Gibson



- Diet is the primary behavioural factor manipulated by patients with IBD.
- Crucially, patients with IBD want to know what they should eat to improve their underlying condition.
- They generally find it a **frustrating trial-and-error process** of identifying foods that trigger symptoms.
- An examination of the top 30 hits on two popular search engines published in 2014 revealed a surfeit of advice for food choice in patients with IBD, but the **recommendations were often conflicting** (Hou JK et al: *Clin. Gastroenterol. Hepatol.* 2014).
- These findings are supported in a UK survey of patients with ulcerative colitis, in which **adherence to national dietary guidelines was poor and food avoidance strategies led to nutritional inadequacy** (Walton M, *Brit. J. Nutr.* 2014).



Intervento nutrizionale nei soggetti con IBD



Dietary management of IBD—insights and advice

Nat. Rev. Gastroenterol. Hepatol. 12, 133–146 (2015);

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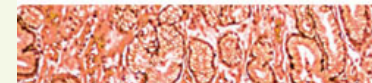


Table 2 | Global measures of nutritional status

Measure	Indicated population	What it assesses	Description	Pros	Cons
BMI ¹¹	Everyone	Undernutrition and overnutrition	Ratio of weight (in kg) to the square of height (in m)	Easy and immediate information	Poor marker of malnutrition, muscle and fat mass, particularly in overweight or in the presence of oedema; might falsely reassure
Subjective Global Assessment ¹²⁸	Hospitalized adult patients	Undernutrition	Five-point questionnaire providing descriptive information	Accurate and detailed information easily referenced after completion	Very time consuming and difficult to complete
Malnutrition Screening Tool ¹²⁹	Hospitalized adult patients	Undernutrition	Two questions regarding appetite and recent unintentional weight loss	Simple and quick to complete	Lacks details
Mini Nutritional Assessment ¹³⁰	Elderly patients in community	Undernutrition	An initial six questions that indicate whether the full 18-question assessment is required	Validated and reliable	Only applicable in elderly patients
Skin-fold measurements ¹³¹	Everyone	Undernutrition and overnutrition	Estimating body fat percentage through clasp fat with callipers	Cheap, easy and immediate information	Only assesses fat mass and has large interobserver and intraobserver variations
Bioelectrical Impedance Analysis ¹³²	Everyone	Undernutrition and overnutrition	Estimates total body water, fat mass, fat-free mass and muscle mass through measures of resistance, usually with a stand-on scale	Cheap, easy, noninvasive and immediate information	Will usually measure body composition through legs only; inaccurate in the presence of expansion of extracellular water
Whole-body MRI ¹³³	Everyone	Undernutrition and overnutrition	Assessment of skeletal muscle, subcutaneous fat, visceral fat and intermuscular fat of separate anatomical regions	Visceral fat is better identified than in bioelectrical impedance analysis	Expensive
Dual-energy X-ray absorptiometry ¹³⁴	Everyone	Undernutrition and overnutrition	Measures total lean body mass and total and regional fat mass	Similar estimates of fat mass to MRI	Cheaper than MRI; exposure to ionising radiation, but dose very small
Albumin ¹³⁵	Everyone	Undernutrition	Potential marker of malnutrition in quiescent disease; also influenced by factors other than nutrition such as rate of synthesis by the liver (negative-phase reactant) and loss of protein from gut and/or kidney	Cheap, easy and can be included as part of routine blood tests	Poor predictor of nutritional status in active disease
Pre-albumin ¹³⁶	Everyone	Undernutrition	Potential marker of malnutrition in quiescent disease, but also influenced by factors other than nutrition	Shorter half-life and potentially better indicator of nutritional status than albumin	Poor predictor of nutritional status in active disease

Dietary management of IBD—insights and advice

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USING DIET TO PREVENT IBD

- **‘Westernized’ diet**—characterized by increased intake of the amount of food *per se* and of food that has higher fat and refined carbohydrate with low-fibre content, and by reduced intake of fruit and vegetables—is associated with the development of both Crohn’s disease and ulcerative colitis and that each specific component cannot account for disease.
- The best advice that can emerge from the evidence is to follow current recommendations of a **‘healthy diet’**, which comprises adequate but not excessive protein, correct ratio of PUFA, high levels of fibre and increased intake of fruit and vegetables (high levels of unrefined grains and vegetables, moderate amounts of meat and/or meat alternatives and fruit, together with a variety of foods from all food groups, inclusion of whole-foods instead of refined products and emphasis of increased plant-based instead of animal-derived foods)
- **Breastfeeding** of neonates for at least 3 months should be encouraged.



Dietary management of IBD—insights and advice

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DIET TO INFLUENCE DISEASE ACTIVITY

- Penetration into therapeutic guidelines and actual clinical practice of dietary approaches to reduce inflammation has been limited.
- **EEN** for active Crohn's disease, at least in paediatric practice ⇒ remission and mucosal healing without corticosteroids, and promote growth,
- **Correction of vitamin D** deficiency is recommended on the basis of bone health alone.
- **Increasing dietary fibre** intake in maintenance of ulcerative colitis has some support, but it is not clear what fibre should be used.
- The use of **personalized whole-food avoidance strategies** in maintenance of remission in Crohn's disease is a challenging technique and the increment of benefit demonstrated is not great.



Dietary management of IBD—insights and advice

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SYMPTOMS AMENABLE TO DIETARY CHANGE

- **Micronutrient deficiency** (Fe, Mg, Zn, folate, vit B₁₂, vit D) ⇒ dietary modification and oral supplementation
- **Functional gut symptoms** ⇒ FODMAP, gluten-free, wheat-free, dairy free diets
- **Prevention of obstruction** ⇒ diet low in insoluble fibre or total fibre
- **Fat maldigestion or absorption** (pancreatic exocrine insufficiency in IBD = 22%) ⇒ matching fat intake with adequate dosing of pancreatic enzyme replacement therapy rather than restriction of dietary fat, because malnutrition and nutritional adequacy of particularly fat-soluble vitamins are of concern in IBD
- **Prevention of kidney stones** (in particular in resectional surgery) prevention of dehydration, Ca supplementation or increased dietary Ca to bind available oxalate and a low oxalate diet.



Interaction between ingested nutrients and gut endocrine cells in patients with irritable bowel syndrome (Review)

MAGDY EL-SALHY^{1,2}, ODD HELGE GILJA^{2,3}, DORIS GUNDERSEN⁴,
JAN G. HATLEBAKK² and TRYGVE HAUSKEN²

INTERNATIONAL JOURNAL OF MOLECULAR MEDICINE 34: 363-371, 2014

Diet triggers symptoms in IBD patients, possibly as a result of interactions with the **gut endocrine cells**.

The **protein, fat and CHO** content of ingested foods determine the amount and type of gut hormones released, which will in turn regulate and control gastrointestinal motility and sensation, that have been reported to be abnormal in IBD patients

- **FODMAPs** in the diet increase the osmotic pressure and provide a substrate for bacteria fermentation and gas production in the large intestine, resulting in **abdominal distension**.
- The increase in intestinal pressure may cause the release of **serotonin and substance P**, which in turn may result in the sensation of **abdominal discomfort or pain**.

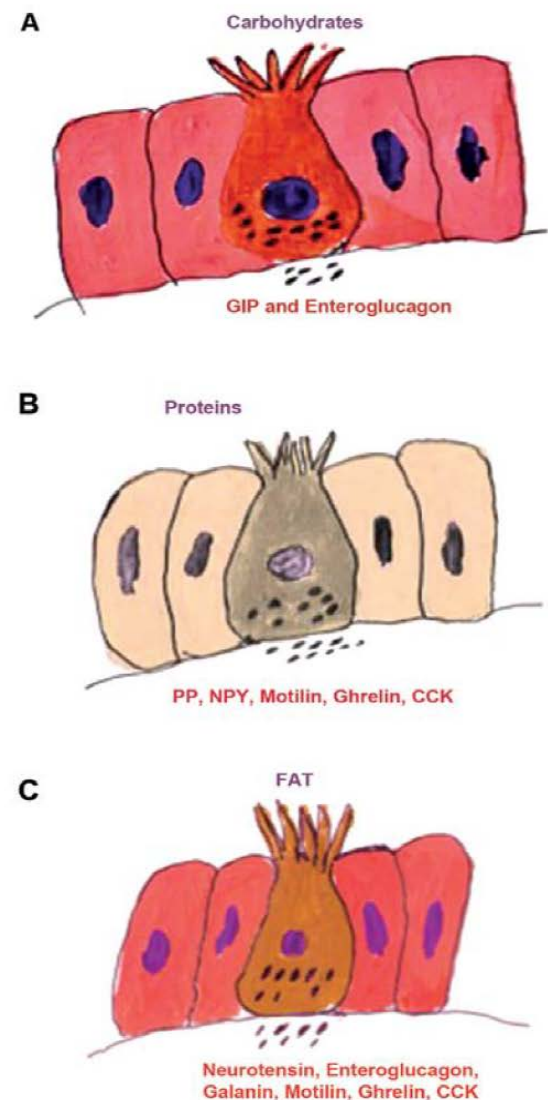


Figure 1. The gut hormones released into the interstitial fluid of the lamina propria in response to intraluminal nutrient content vary according to the proportions of (A) carbohydrates, (B) proteins and (C) fats. These hormones may act in an endocrine/paracrine manner or as neurotransmitters/neuro-modulators of neurons in the ENS.

Environmental Factors in the Relapse and Recurrence of Inflammatory Bowel Disease: A Review of the Literature

Thomas D. Martin · Simon S. M. Chan ·
Andrew R. Hart

Dig Dis Sci (2015) 60:1396–1405



DIETARY FACTORS AND IBD RELAPSE

- One mineral for which there are plausible biological mechanisms for inducing relapse is **sulfur**. Dietary sulfur is present as sulfated amino acids, inorganic sulfur and a preservative food additive. Sulfur may be toxic to human colonocytes following its metabolism by colonic bacteria to hydrogen sulfide (H₂S) superficial mucosal ulceration, dose dependent apoptosis, and loss or shrinkage of goblet cells and crypts, inhibition of the butyrate-dependent energy metabolism of colonocytes
 - A high consumption of red and processed meat was positively associated with relapse (OR 5.19, 95 % CI 2.09–12.9), and meat protein is an important source of sulfide generation in the gut. Furthermore, a high alcohol intake was also positively associated with UC (OR 2.42, 95 % CI 1.04–5.62), which may be relevant as sulfides are added to alcohol for both flavor and a preservative.
- A **high intake of total, saturated, and monounsaturated fats**, and a **higher ratio of n-6/n-3 polyunsaturated fatty acids** with active disease are associated with a more active disease phenotype, mainly in patients carrying the variant alleles of TNF-alpha (857 C/T polymorphism) and IL6 (174 G/C polymorphism).



Inflammatory bowel disease: a global perspective

June 2009



Diet and lifestyle considerations:

- **dietary changes may help reduce symptoms:**
 - during increased disease activity, it is appropriate to decrease the amount of fiber
 - dairy products can be maintained unless not tolerated
 - a low-residue diet may decrease the frequency of bowel movements
 - a high-residue diet may be indicated in cases of ulcerative proctitis (disease limited to the rectum, where constipation can be more of a problem than diarrhea)
 - there are limited data suggesting that a reduction of dietary fermentable oligosaccharides, disaccharides, and monosaccharides and polyols may reduce the symptoms of IBD
- **dietary or lifestyle changes may reduce inflammation in IBD:**
 - a liquid diet, pre-digested formula, or nothing by mouth (NPO status) may reduce obstructive symptoms. Exclusive enteral nutrition can settle inflammatory disease, especially in children
 - smoking cessation benefits patients with IBD
- reduction of **stress** and better stress management may improve symptoms or the patients' approach to their disease



The role of FODMAPs in irritable bowel syndrome



Susan J. Shepherd^{a,b}, Emma Halmos^b, and Simon Glance^c

Curr Opin Clin Nutr Metab Care 2014, 17:605–609

DOI:10.1097/MCO.0000000000000116

- **FODMAPs** are a collection of poorly absorbed, short-chain carbohydrates that naturally occur in many foods.
- Mechanism studies have shown that FODMAPs cause luminal distension through their **fermentation** by colonic bacteria and subsequent gas production, and through their osmotic activity
- The acronym FODMAP (Fermentable Oligosaccharides, Disaccharides, Monosaccharides and Polyols) describes: the **oligosaccharides** fructans and galacto-oligosaccharides present in wheat, rye, onions, garlic and legumes; the **disaccharide** lactose present in milk and yoghurt; the **monosaccharide** fructose (when consumed in excess of glucose) present in honey, apples, pears and high fructose corn syrup; and **polyols** including sorbitol and mannitol present in apples, pears, stone fruit and many artificially sweetened gums and confectionary



The role of FODMAPs in irritable bowel syndrome

Susan J. Shepherd^{a,b}, Emma Halmos^b, and Simon Glance^c

Curr Opin Clin Nutr Metab Care 2014, 17:605–609

DOI:10.1097/MCO.0000000000000116



- FODMAPs (particularly oligosaccharides) are **prebiotic** when supplemented into a diet, that is, they specifically increase growth of bacteria with reputed health benefits. FODMAPs are also **precursors SCFA** production in the colon, known to be important for colonic health
- Given the known benefits of FODMAP supplementation, it is reasonable to hypothesize that a low FODMAP diet would counteract the prebiotic actions of FODMAPs and reduce SCFA production.
- However, different studies have shown that the low FODMAP diet did not specifically reduce abundance of any measured bacteria (Faecal bifidobacteria in particular, traditionally a marker of prebiotic effect), compared with a parallel group of IBS subjects on their habitual diet.
- These studies indicate that despite a prebiotic effect from FODMAP supplementation, FODMAP reduction is not 'antiprebiotic'. No alterations in faecal SCFA were seen.



Sensitivity to wheat, gluten and FODMAPs in IBS: facts or fiction?

Gut 2016;**65**:169–178. doi:10.1136/gutjnl-2015-309757

Roberto De Giorgio,¹ Umberto Volta,¹ Peter R Gibson²



Adherence and degree of difficulty in following the FODMAPs diet

Adherence was high where all food was provided on the basis of dietary diaries and breath hydrogen testing.

In a prospective evaluation of 90 patients with IBS in New Zealand, in which the diet was taught by a dietitian via one or two consultations, 61% of participants stated that the diet was easy to follow and 44% were able to incorporate the diet easily into their life.

Adherence rates were also high, possibly because non-adherence was associated with symptom induction.



Efficacy of the low FODMAP diet for treating irritable bowel syndrome: the evidence to date

Table 2 Examples of food high in FODMAPs and suitable low FODMAP alternatives

Types of sugars	High FODMAPs food	Low FODMAP alternatives
Oligosaccharides	FOS Grains: wheat-, rye-, and barley-based products Vegetables: onion, garlic, artichokes, leeks, beetroot, and savoy cabbage Fruits: watermelon, peaches, persimmon, prunes, nectarines and most dried fruit GOS Legumes: red kidney beans, baked beans, and soya beans Vegetables: beetroot and peas	Fruit: banana, most berries (except boysenberries and blackberries), grapes, lemon, lime, mandarin, orange, kiwi fruit, pineapple, passion fruit, and rhubarb Vegetables: capsicum, bok choy, green beans, parsnip, silverbeet, cucumber, carrots, celery, eggplant, lettuce, potatoes, yams, tomatoes, and zucchini Grains: wheat-free grains/flour, gluten-free bread or cereal products, and quinoa
Disaccharides	Lactose Dairy products: cows/goat milk, and yoghurt	Dairy products: lactose-free, almond or rice-based milk, yoghurt and ice cream, hard cheese, feta and cottage cheese
Monosaccharides	Fructose (in excess of glucose) Fruits: apples, pears, watermelon, mango, cherries, boysenberries and fruit juice from high-fructose foods Honey Sweeteners: high-fructose corn syrup Vegetable: asparagus and snap peas	Fruit: banana, grapes, honeydew, melon, kiwifruit, lemon, lime, mandarin, orange, passionfruit, paw paw, and most berries (except boysenberries and blackberries) Sweeteners: maple syrup and golden syrup
Polyols	Sorbitol Fruit: apples, pears, avocado, apricots, blackberries, nectarines, peaches, plums, prunes, and watermelon Mannitol Vegetables: sweet potato, mushrooms, cauliflower, and snow peas	Sweeteners: Maple syrup, and sugar (sucrose) Fruits: banana, grape, honeydew, melon, kiwifruit, lemon, mandarin, orange, passionfruit, and paw paw

Notes: Data from Monash University. Low FODMAP Diet Application. Available at: <http://www.med.monash.edu/cecs/gastro/fodmap/>. Android version accessed August 26, 2015.⁷²

Abbreviations: FODMAP, fermentable oligosaccharide, disaccharide, monosaccharide, and polyols; FOS, fructo-oligosaccharides; GOS, galacto-oligosaccharides.

Sensitivity to wheat, gluten and FODMAPs in IBS: facts or fiction?

Gut 2016;**65**:169–178. doi:10.1136/gutjnl-2015-309757

Roberto De Giorgio,¹ Umberto Volta,¹ Peter R Gibson²



Risks of a diet low in FODMAPs

- **Ca intake** may be compromised in some patients, presumably in subjects who restricted lactose
- **reduction of fibre** intake unless action is taken to seek non-wheat sources of fibre
- **psychosocial risks** related to difficulties in socialisation and eating away from home through to the precipitation of eating disorders such as orthorexia nervosa
- **alteration of gut microbiota**, such as changing total bacteria abundance and altering the relative abundance of Bifidobacteria
- changes in the relative abundance of strongly butyrate producing Clostridal groups or the mucus-associated bacterium *Akkermansia muciniphila*



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Table 3 Comparison of gluten-free and low-FODMAP diets in patients with IBS with apparent wheat intolerance

	Gluten-free diet	Low FODMAP diet
Putative pathogenic mechanisms targeted	<ul style="list-style-type: none"> ▶ Epithelial injury, alteration of intestinal permeability ▶ Stimulation of innate immune mechanisms 	Mechanoreceptor stimulation via luminal distension in small and large intestine
Likelihood of efficacy	24% of 920 patients with IBS ³⁶	Efficacy in 68–76% ²² ←
Time for response	Not reported	Within 7 days ⁶⁵
Predictors of response	<ul style="list-style-type: none"> ▶ Increase intraepithelial density in duodenum⁵³ ▶ Positive double-blind placebo-controlled re-challenge or confocal laser endomicroscopic lesions in response to exposure¹⁷ ▶ Latent coeliac disease 	Nil reported
Durability of response	Durable over 1 year (n=13) ¹⁷	72% (n=90) satisfied with mean follow-up 15.7 months ⁷²
Ease of introduction	<ul style="list-style-type: none"> ▶ Large amount of high-quality literature available on the GFD ▶ Dietitians trained in GFD widely in some but not other countries ▶ No information regarding patients' perspective 	<ul style="list-style-type: none"> ▶ High quality information readily available ▶ Paucity of dietitians trained in this diet in many countries ▶ 61% patients find it easy to follow, 44% easily incorporated into lifestyle in prospective study (n=90)⁷²
Adherence	Not reported in this patient group	Adherence 76% in prospective (n=90) observational study ⁷²
Advantages ←	<ul style="list-style-type: none"> ▶ Diet directed to underlying pathogenic mechanism ▶ Widely understood and packaged/processed foods available in many countries 	<ul style="list-style-type: none"> ▶ High chance of response ▶ In the long term, need only reduce the level of FODMAP intake sufficiently to achieve symptomatic benefit. Alternatives available across all four food groups
Disadvantages ←	<ul style="list-style-type: none"> ▶ Restriction only in one food group ▶ Low chance of symptomatic response ▶ Gluten-free packaged/processed food: <ul style="list-style-type: none"> – More expensive – Often high fat, high sugar – Issues of food texture (breads, pasta, cakes, biscuits) ▶ Exclusion diet= requirement for total abstinence from gluten ▶ Difficult in countries where food labelling inadequate 	<ul style="list-style-type: none"> ▶ Symptomatic therapy only ▶ Restrictions across a four food groups ▶ International food database of FODMAP content limited ▶ Limited availability of branded low FODMAP packaged and/or processed foods
Specific risks: nutritional adequacy ←	<ul style="list-style-type: none"> ▶ Restrictions on the intake of many breads and cereals may lead to deficient intake of folate, thiamine, fibre ▶ Calcium, iron and zinc intake less than population ▶ Many gluten-free foods not nutritionally balanced 	<ul style="list-style-type: none"> ▶ If not exchanged for low FODMAP alternatives: <ul style="list-style-type: none"> – Restriction of lactose-containing dairy products may lead to deficient intake of calcium, vitamin D – Restriction of legumes, grains and cereals may lead to deficient intake of folate, thiamine, fibre ▶ Natural prebiotic intake reduced⁶⁵
Specific risks: other ←	<ul style="list-style-type: none"> ▶ Risks of precipitating an eating disorder ▶ Impaired ability to exclude coeliac disease if diet commenced prior to investigation 	<ul style="list-style-type: none"> ▶ Risks of precipitating an eating disorder ▶ Alteration of gut microbiota when on strict FODMAP restriction⁶⁷ has unknown implications for long term

FODMAP, fermentable oligo-di-mono-saccharides and polyols; GFD, gluten-free diet.

- **Adeguamento dietetico dieta Low FODMAP**
- **Miglioramento della sintomatologia in pazienti affetti da IBS con documentata SIBO e trattati con rifaximina**

(Cuoco et al Gastroenterol Dietol 2006)

(Peralta et al World J Gastroenterol 2009)

- **Miglioramento della sintomatologia in pazienti affetti da IBS trattati con probiotici**

Bifidobacter.infantis 35624 (Whorwell et al Am j Gastroenterol 2006)

Bifidobacter.animalis DN173010(Guyonnet et al Aliment Pharm Ther 2007)

Bifidobacter.bifidum MIMBb75(Guglielmetti et al Aliment Pharm Ther 2011)

Lactob.Plantarum 299V(Niedzielin et al Gastroenterol Hepatol 2001)

*L.Acidophilus*NCFM+*B.Lactis* Bi07(Ringel et al Clin Gastroenterol 2011)

L. Rhamnosus e *B.lactis*(Lesnsiewska et al Exp Physiol 2006) e *E.coli* Nissle 1917(Bar et al Neurogastroenterol Motil 2009) modulerebbero l'attività mioelettrica della muscolatura liscia intestinale



CLINICAL GUIDELINES

British Dietetic Association systematic review of systematic reviews and evidence-based practice guidelines for the use of probiotics in the management of irritable bowel syndrome in adults (2016 update)

Y. A. McKenzie,¹ J. Thompson,² P. Gulia³ & M. C. E. Lomer^{4,5} (IBS Dietetic Guideline Review Group on behalf of Gastroenterology Specialist Group of the British Dietetic Association)

- This systematic review of 35 probiotic RCTs from nine systematic reviews shows that the **evidence for using specific probiotics to improve IBS symptoms is inadequate**, probably as a result of the heterogeneity of IBS and probiotics and a limited amount of research that has investigated IBS subtypes, as well as the same dose-specific probiotic and formulation.
- There was **no consistency of efficacy between different probiotics** and no product specific recommendations can be made for use in clinical practice.



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Recommendation	Grade
Advise that probiotics are unlikely to provide substantial benefit to IBS symptoms. However, individuals choosing to try probiotics are advised to select one product at a time and monitor the effects. They should try it for a minimum of 4 weeks at the dose recommended by the manufacturer (2016)	B
For individuals with IBS, taking a probiotic product is considered safe in IBS (2016)	B

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Trimotore Idrovolante CZ.506 – Marche I-RODI

