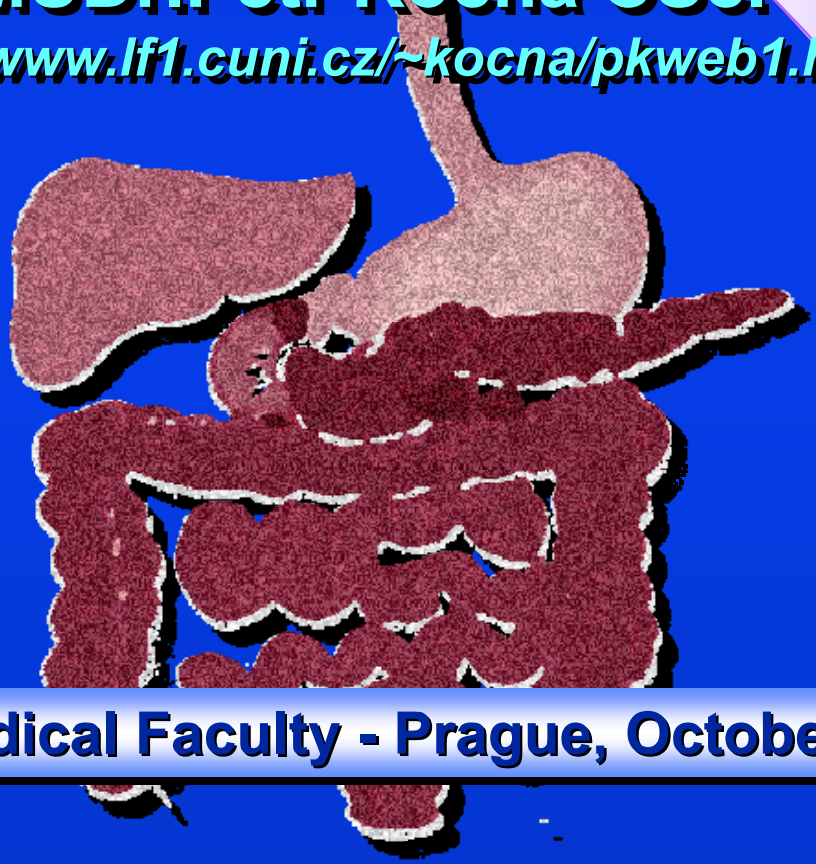
FIRST FACULTY OF MEDICINE
CHARLES UNIVERSITY IN PRAGUE

VFN PRAHA

GASTROENTEROLOGY
LABORATORY DIAGNOSTICS & CASES

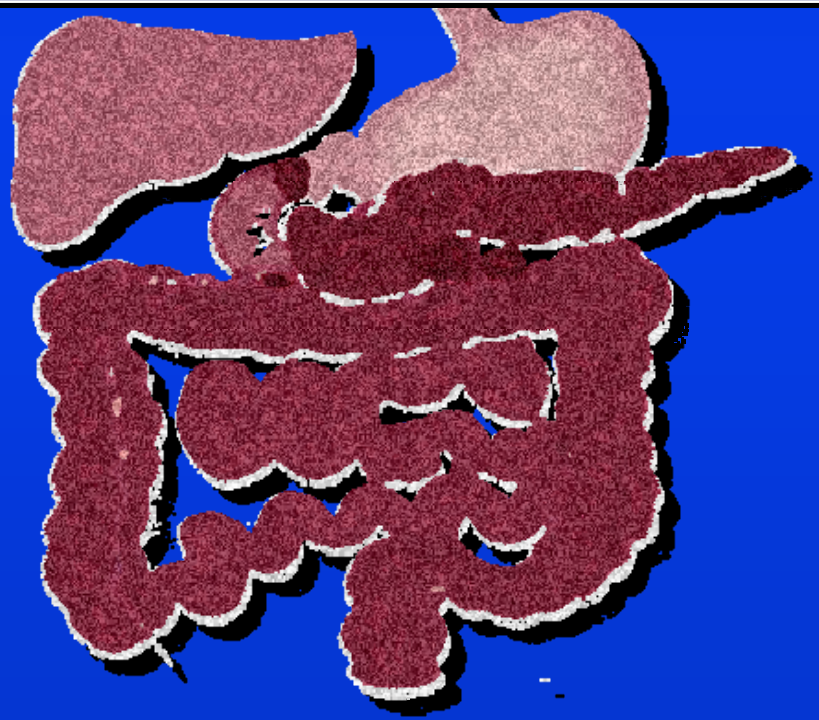
MUDr.Petr Kocna CSc.

http://www.lf1.cuni.cz/~kocna/pkweb1.htm



Seminar Medical Faculty - Prague, October 2023

HELICOBACTER PYLORI
PEPSINOGENS, GASTRITIS
COELIAC SCREENING - THERAPY
CHRONIC PANCREATITIS
EXOCRINE PANCREATIC FUNCTION
QUANTITATIVE FIT
COLORECTAL CANCER SCREENING



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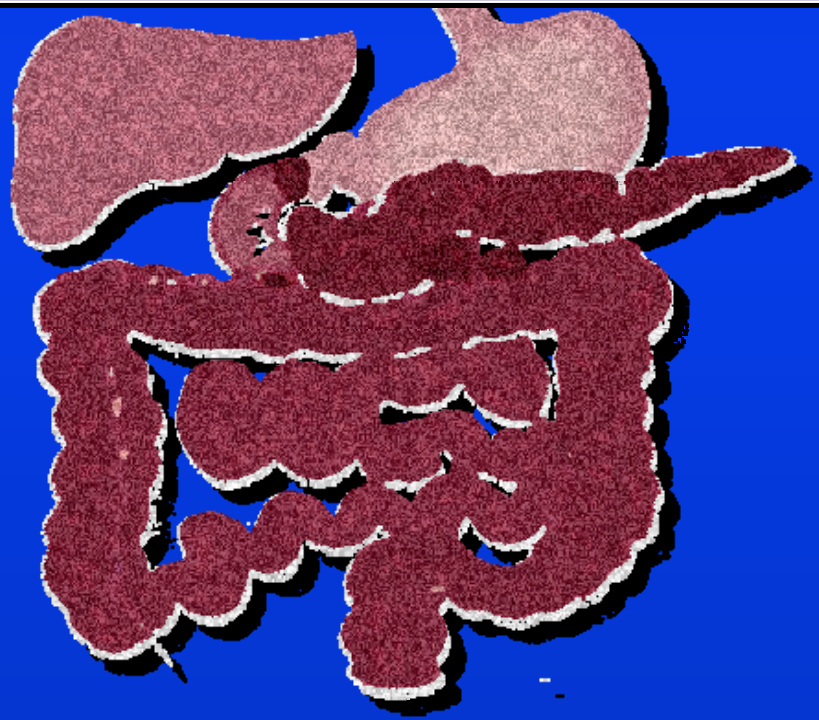
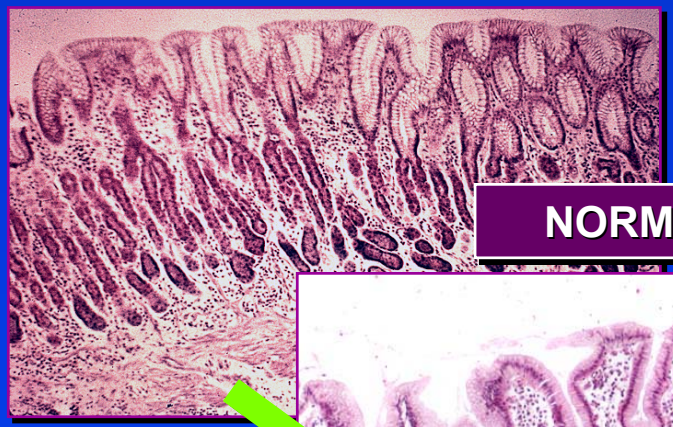
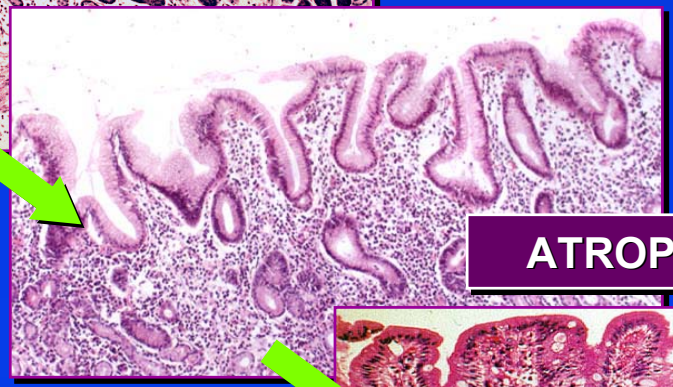


GASTRITIS - CARCINOMA SEQUENCES

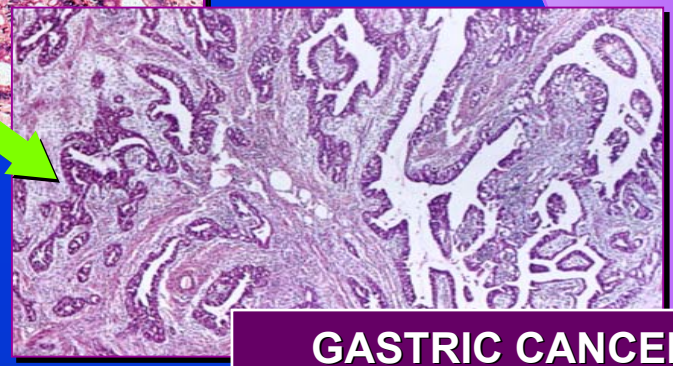


NORMAL MUCOSA



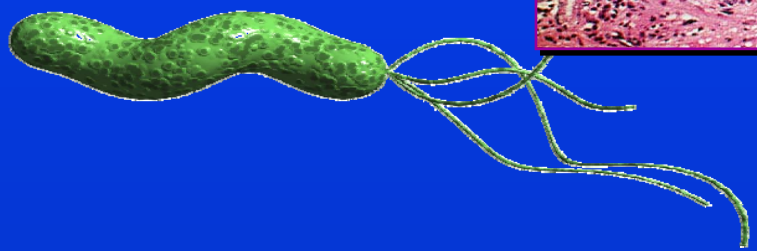
ATROPHIC GASTRITIS

INTESTINAL METAPLASIA



GASTRIC CANCER

Hp - IARC 1994
1.class cancerogen



CASE: 12-01

Male - J.N. - IT specialist - born 1978

in childhood common childhood diseases,

none of injury, none of hospitalization, parents in healthy,

severe disease in the family - who do not know.

Now does not have any subjective complainrts.

On the internet he found - Hp is cancerogen of the 1.class

On the internet he found - LG laboratory, non-invasive Hp test

Comes to LG laboratories with requirement for Hp test - UBT

CASE: 12-01 - laboratory data

^{13}C-UBT performed on the individual wish (self-paying)

Value of ^{13}C DOB – 14.1 ‰, Hp - positive

(Normal values up to DOB 5 ‰)

On the internet he found - suitable eradication therapy

Comes to GE ambulance with requirement for eradication therapy, which the alone cannot pay

European Helicobacter Pylori Study Group

Current Concepts in the Management of Helicobacter pylori Infection

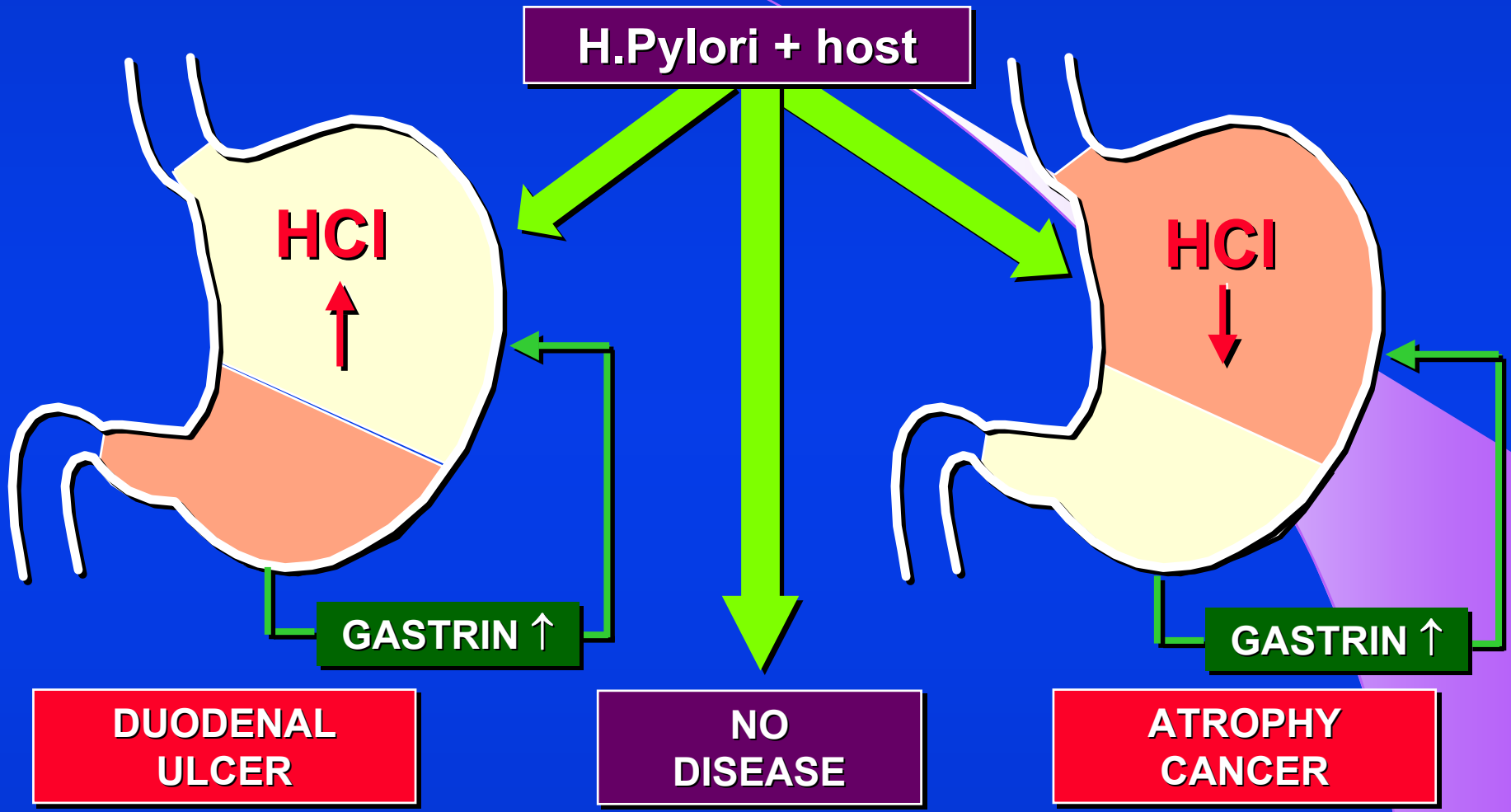
The Maastricht 2-2000 Consensus Report

September 2000

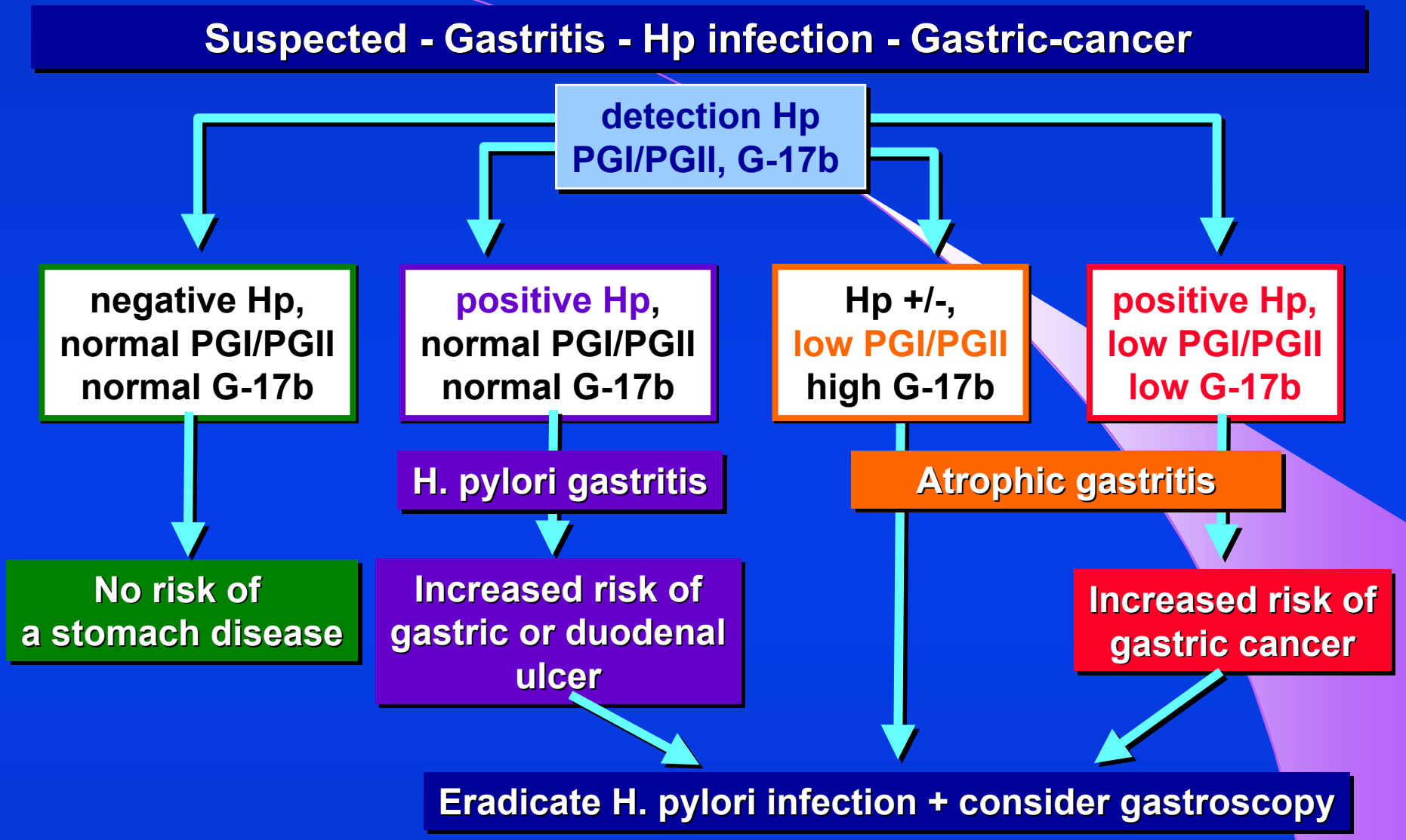
WHO TO TREAT - STRONGLY RECOMMENDED INDICATIONS

DU/GU (active or not, including complicated PUD)	1
MALToma	2
Atrophic gastritis	2
Post-gastric cancer resection	3
Patients - first degree relatives of gastric cancer patients	3
Patients wishes (after full consultation with their physician)	4

HOW TO PREDICT RESULT of Hp INFECTION



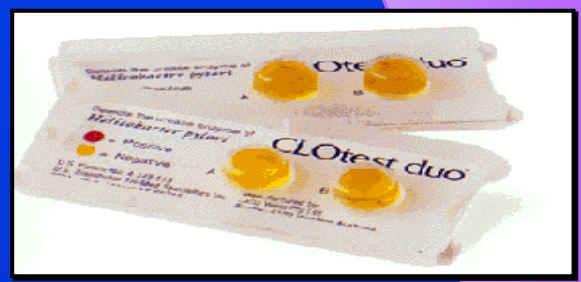
BACTERIAL TRIBE - GENETIC DISPOSITION - ENVIRONMENT - DIETS ?



Rationale in diagnosis and screening of atrophic gastritis with stomach-specific plasma biomarkers. Agréus L, Kuipers EJ, Kupcinskas L, Malfertheiner P, et al. Scand J Gastroenterol. 2012; 47(2):136-147

Hp INFECTION DIAGNOSTIC METHODS

- non-invasive test, gold standard, specificity and sensitivity 95% - 13C UBT, **breath test with 13C-urea**
- non-invasive test, if 13C-UBT not available, **Hp antigen in stool**
- **rapid urease test** (CLO test) - if the gastroscopy clinically indicated, required bioptic samples from at least three different gastro-duodenal positions
- **IgA-IgG antibodies determination** in serum does not have primary diagnostic importance, as positivity to Hp-antibodies in subjects > 60 years could be 85%



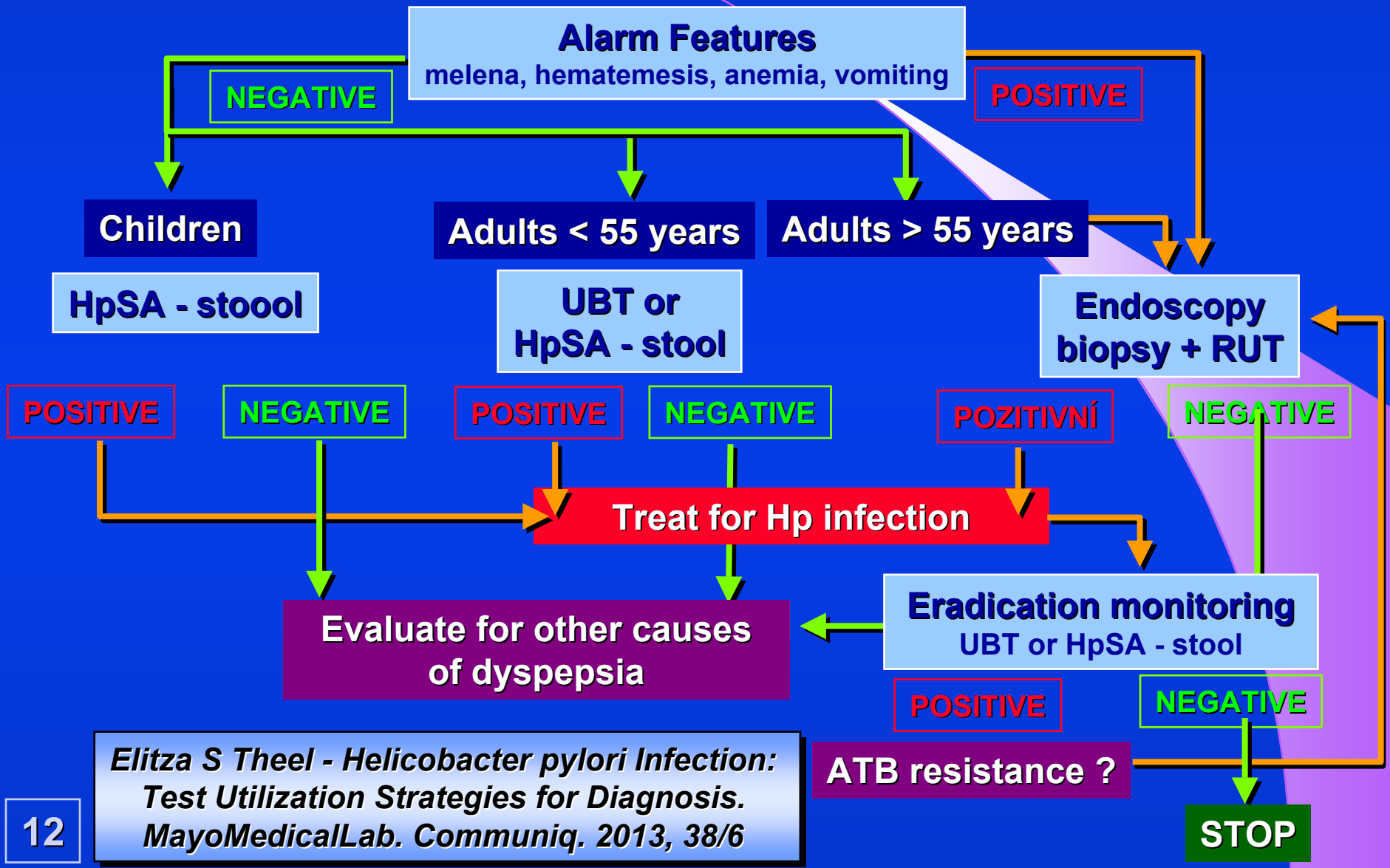
Management of Helicobacter pylori infection - Consensus

Statement 1: **UBT is the most investigated and best recommended** non-invasive test in the context of a 'test-and-treat strategy'. **Monoclonal SAT can also be used.** Serological tests can be used only after validation. Rapid ('office') serology tests using whole blood should be avoided in this regard.
Level of evidence: 2a Grade of recommendation: B

Statement 9: The available data consistently recognise **pepsinogen (Pg)** serology as the **most useful non-invasive test to explore the gastric mucosa status (non-atrophic vs atrophic).** The PgI/PgII ratio can never be assumed as a biomarker of gastric neoplasia.
Level of evidence: 2a Grade of recommendation: A

Management of Helicobacter pylori infection-the Maastricht V/Florence Consensus Report.
Malfertheiner P. et all. - The European Helicobacter Study Group (EHSG). Gut. 2017 Jan; 66 (1): 6-30

ALGORITMUS FOR HELICOBACTER PYLORI IN DYSPEPSIA



Elitza S Theel - Helicobacter pylori Infection: Test Utilization Strategies for Diagnosis. MayoMedicalLab. Communiq. 2013, 38/6

ATROPHIC GASTRITIS SCREENING – PEPSINOGEN I/II RATIO

Age	Number	ACG	H.pylori
< 39	644	2 - 0.3%	0 - 0%
40 - 49	660	11 - 1.7%	5 - 45%
50 - 59	1091	27 - 2.5%	13 - 48%
60 - 69	1117	48 - 4.3%	19 - 40%
> 70	744	62 - 8.3%	19 - 31%
total	4256	150 - 3.5%	56 - 37%

Telaranta-Keerie A, Kara R, Paloheimo L, Härkönen M, Sipponen P. Prevalence of undiagnosed advanced atrophic corpus gastritis in Finland: an observational study among 4,256 volunteers without specific complaints. Scand J Gastroenterol. 2010 Sep;45(9):1036-41.

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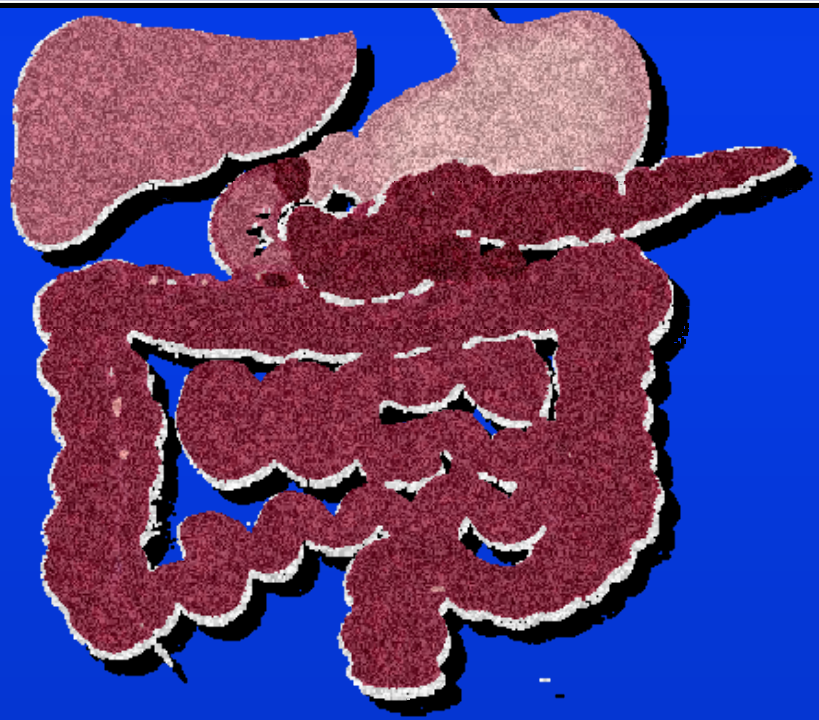


CASE: 12-02

Woman - L.J. - born 1972

in childhood anemic, asthenic, often in sanatoria,

mother and sister followed for thyreopathy

astheny, height 171 cm, weight 52 kg

menarche at 15 years, married,

at the time of diagnosis (2005) after 1 spont. abortion 1994

CASE: 12-02

2005 admitted to gastroenterology clinic

with requiremed of colonoscopy for hypochrome anemia

Colonoscopy - normal findings

Histology of bioptical samples - normal findings

Routine laboratory test indicated

CASE: 12-02 - laboratory data

haemoglobin 117 g/l, haematocrit 0.352

albumin 46.6 g/l

alkaline phosphatase 1.54 ukat/l
alanine aminotransferase 0.52 ukat/l
aspartate aminotransferase 0.43 ukat/l
gamma-glutamyl transpeptidase 0.16 ukat/l

calcium 2.35 mmol/l
phosphate 1.22 mmol/l
ferrum 22.9 mmol/l

total cholesterol 3.19 mmol/l
triglycerides 0.65 mmol/l

CASE: 12-02 - laboratory data

coeliac screening markers - 11/4/05:

IgA anti-transglutaminase 132 U/ml

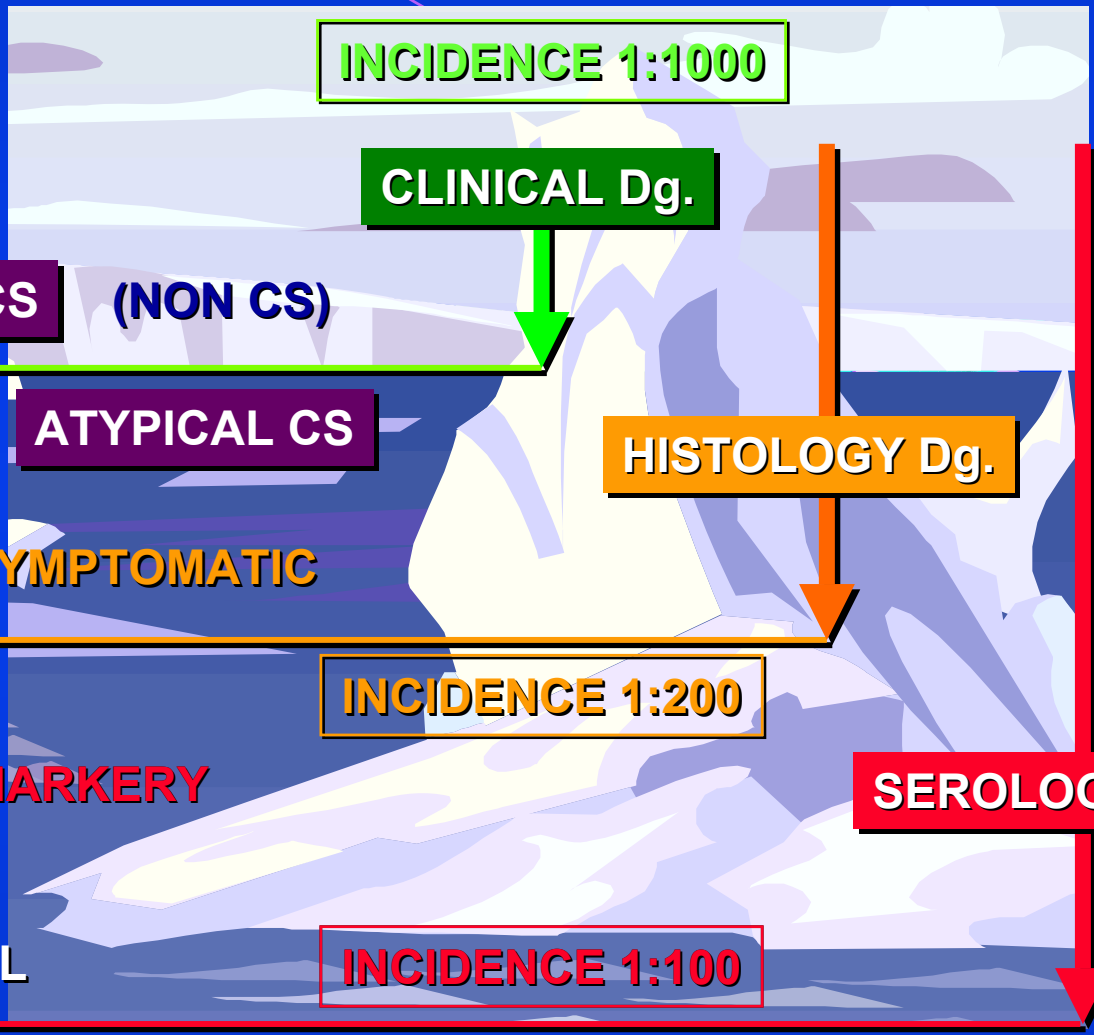
IgA anti-gliadin 30 U/ml

IgG anti-gliadin 132 U/ml

IgA anti-endomysium - positive

Histology - small bowel biopsy: active coeliac, subtotal atrophy, decreased lactase, IEL 50/100

ICEBERG HYPOTHESIS OF COELIAC INCIDENCE



GUIDELINES - TARGETED COELIAC SCREENING

MAIN RISK GROUPS

- Dermatitis herpetiformis
- Osteoporosis, unexplained fractures
- Unexplained anaemia
- Chronic fatigue syndrome
- Resistent irritable bowel syndrome

CD SUSPECTED SYMPTOMS

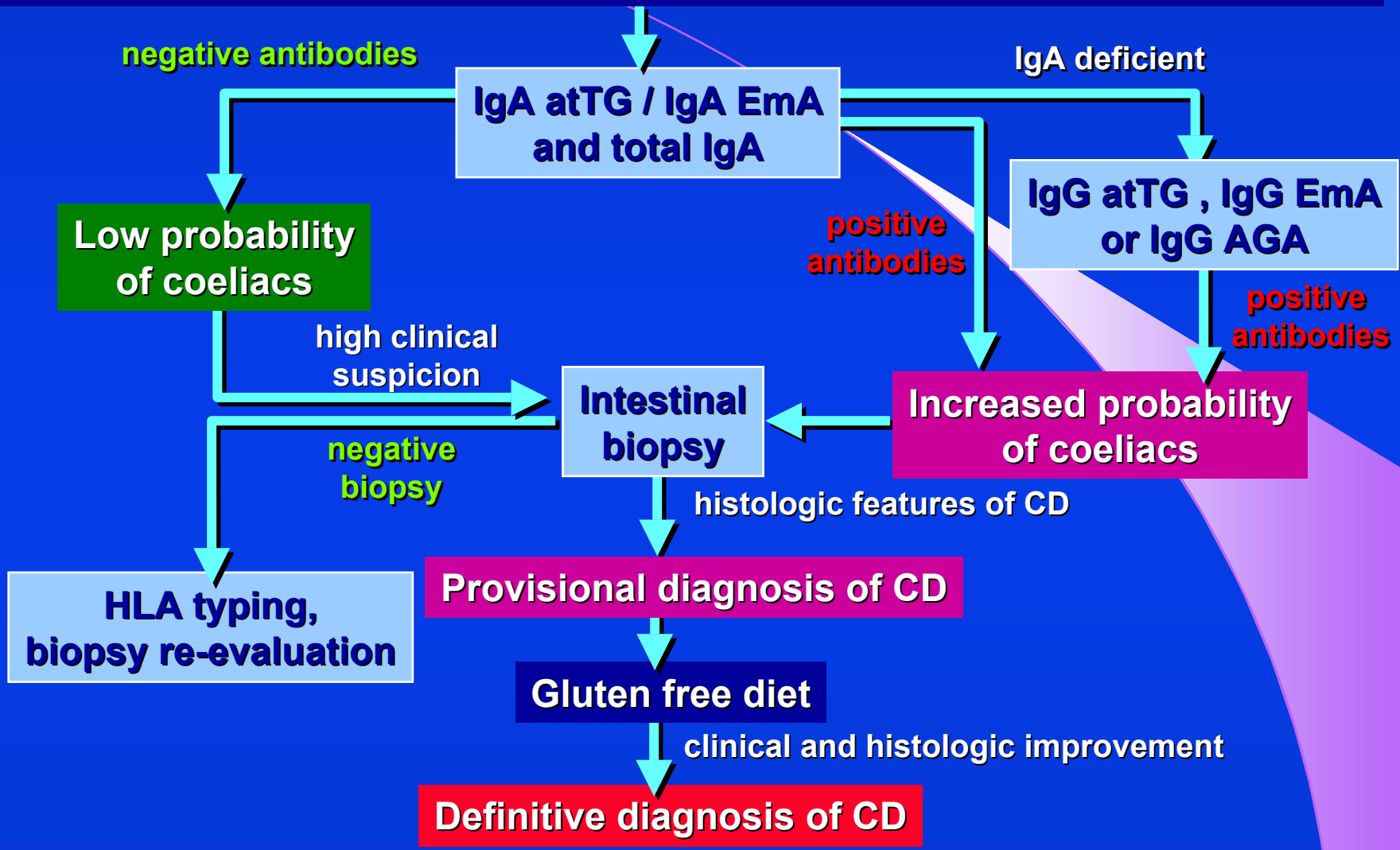
- Spont. abortion and fetal growth retardation
- Unexplained anaemia (iron, folic acid)
- Hypertransaminasemia
- Recurrent aphthous stomatitis
- Dental enamel hypoplasia

AUTOIMUNNE DISEASES

- Diabetes mellitus type 1.
- Autoimmune thyroiditis
- Autoimmune liver disease
- Systemic lupus erythematosus
- Sjögren syndrome
- Primary biliary cirrhosis or sclerosing cholangitis

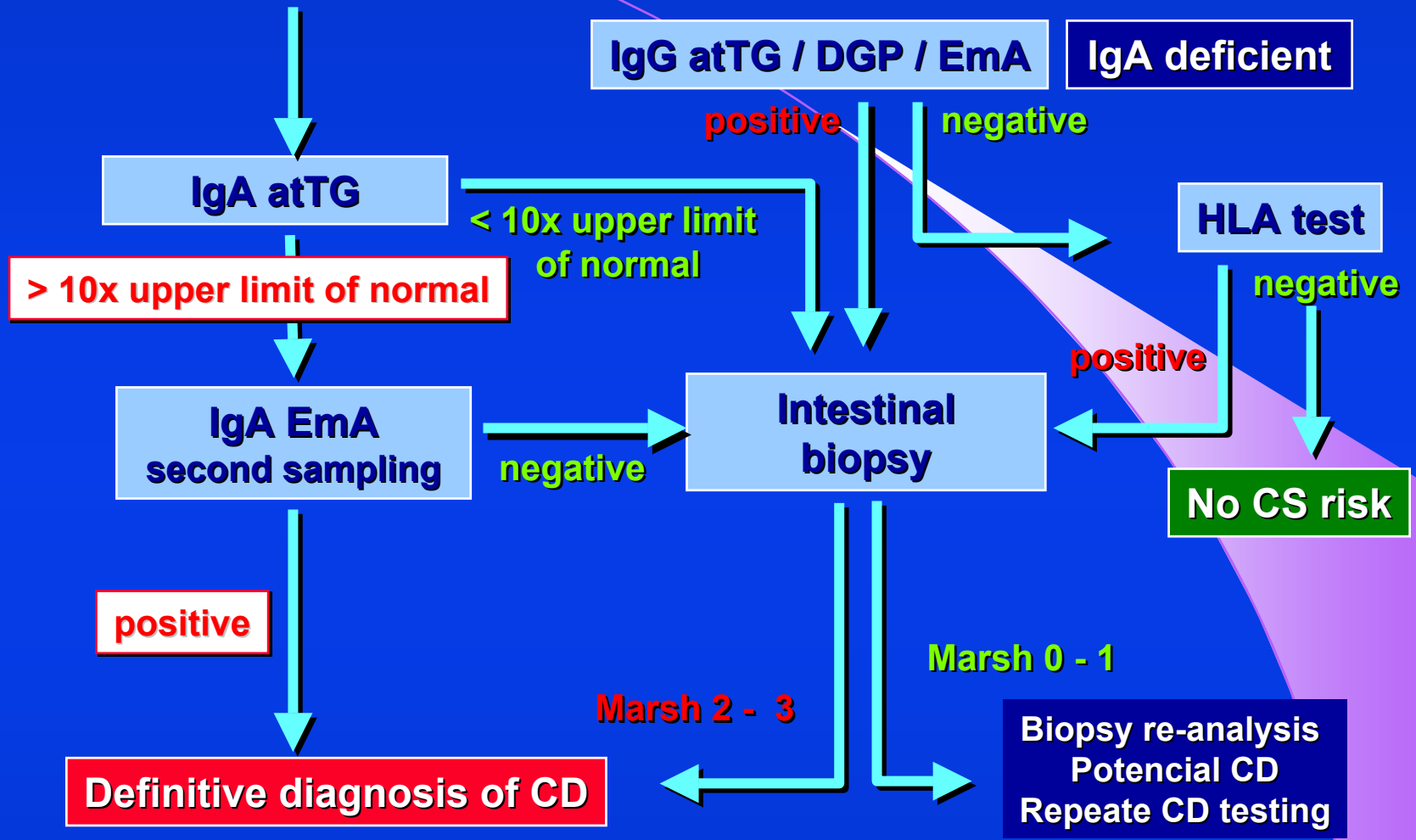
Cílený screening celiakie - Metodický pokyn MZ ČR
Věstník MZ ČR, 2011, částka 3. str. 51-54 - Practicus 2011; 4: 9 - 10

TARGETED SCREENING OF COELIAC DISEASE



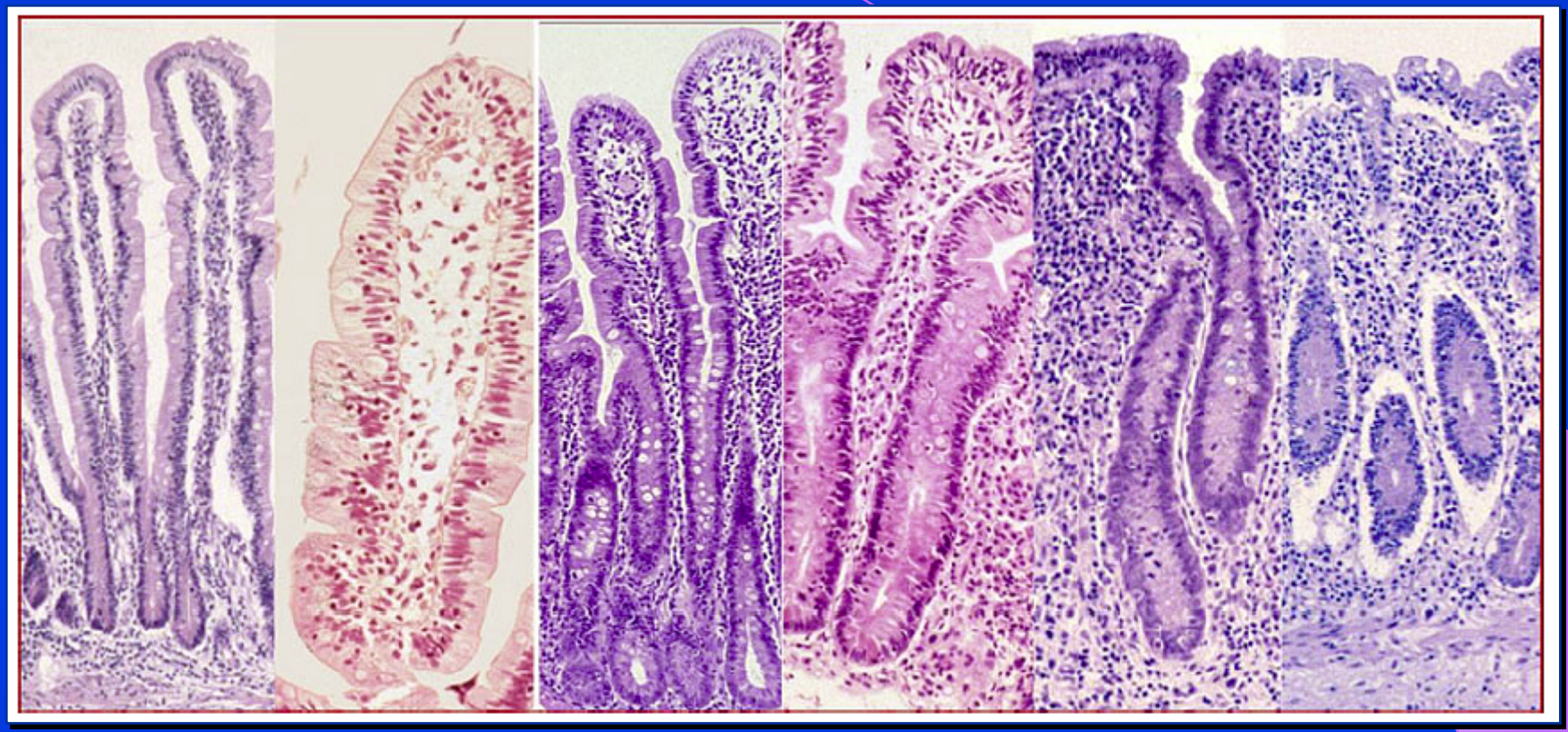
Briani C, Samaroo D, Alaedini A. Celiac disease: from gluten to autoimmunity. Autoimmun Rev. 2008 Sep;7(8):644-650.

SCREENING OF COELIAC DISEASE IN CHILDRENS



European Society Paediatric Gastroenterology, Hepatology and Nutrition Guidelines for Diagnosing Coeliac Disease 2020. Husby S, Koletzko S, Korponay-Szabó I.et al.: J Ped Gastru Nutr. 2020 Jan;70(1):141-156

INTESTINAL BIOPSY IN THE COELIAC DISEASE DIAGNOSTICS

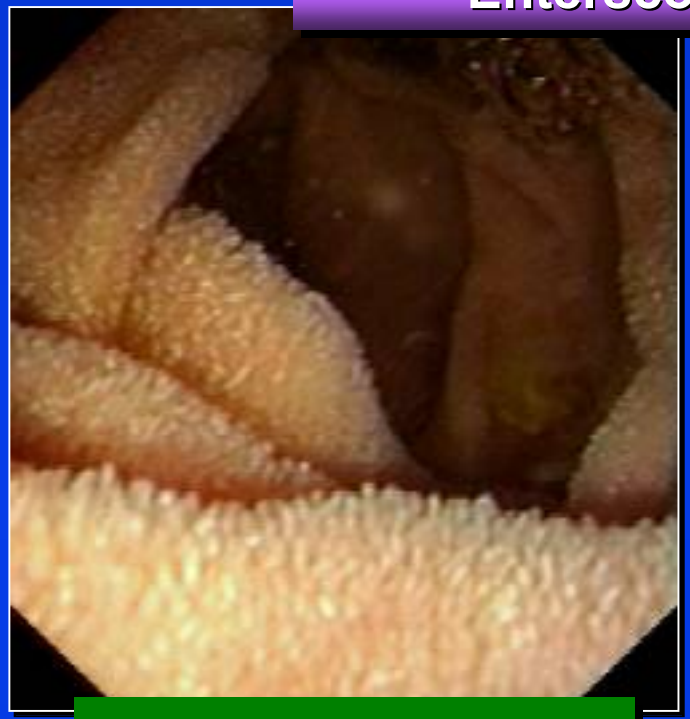


Marsh 0 Marsh 1 Marsh 2 Marsh 3a Marsh 3b Marsh 3c

Clinical practice - Coeliac disease. Kneepkens C. M., von Blomberg B. M. Eur J Pediatr. 2012; 171(7) : 1011 - 1021

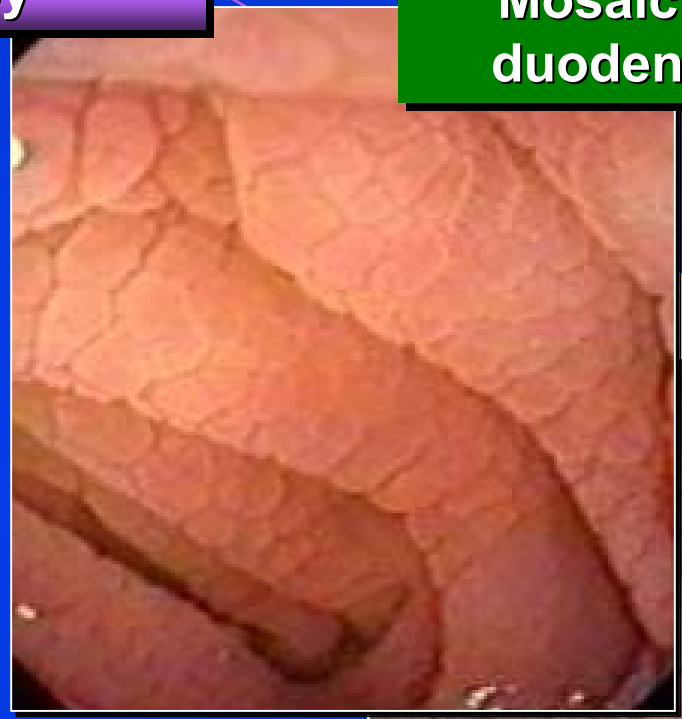
ENDOSCOPIC MARKERS OF COELIAC DISEASE

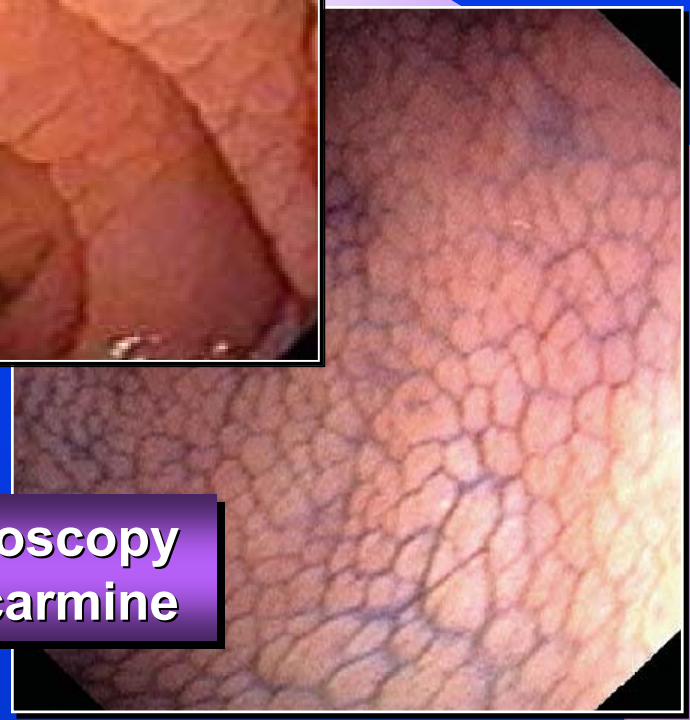
Enterscopy



Normal duodenal musoca

Mosaic pattern of duodenal mucosa



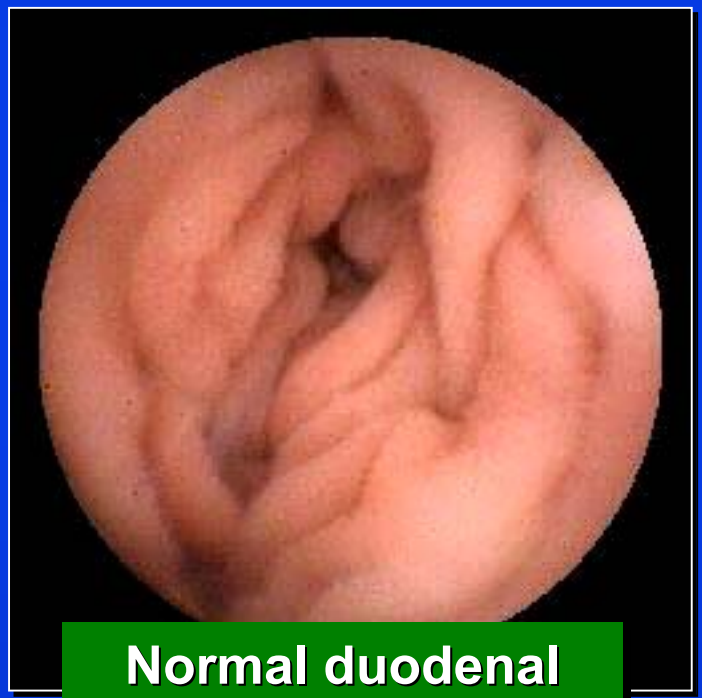


Chromoendoscopy with indigocarmine

http://www.lfhk.cuni.cz/kcvl/stranky/ENTERO/E-cel1.html

CAPSULE ENDOSCOPY

NON-INVASIVE ENDOSCOPIC EXAMINATION



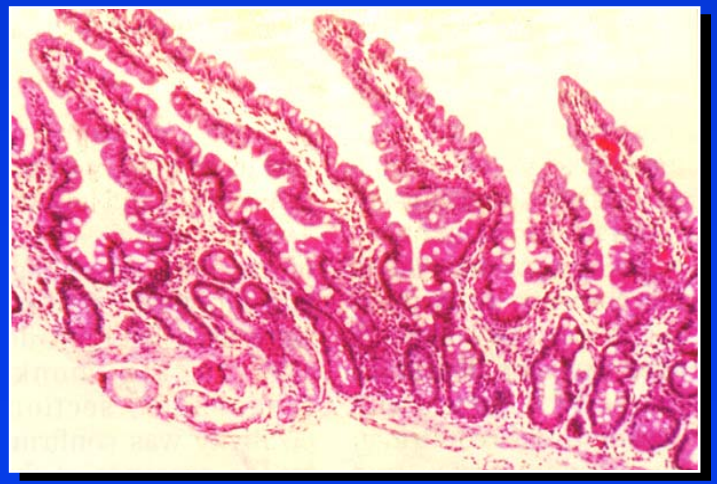
Normal duodenal musoca

Mosaic pattern of duodenal mucosa

http://www.lfhk.cuni.cz/kcvl/stranky/Kapsle/C-CE1.html

GLUTEN FREE DIET (GFD) - SCREENING & DIAGNOSTICS

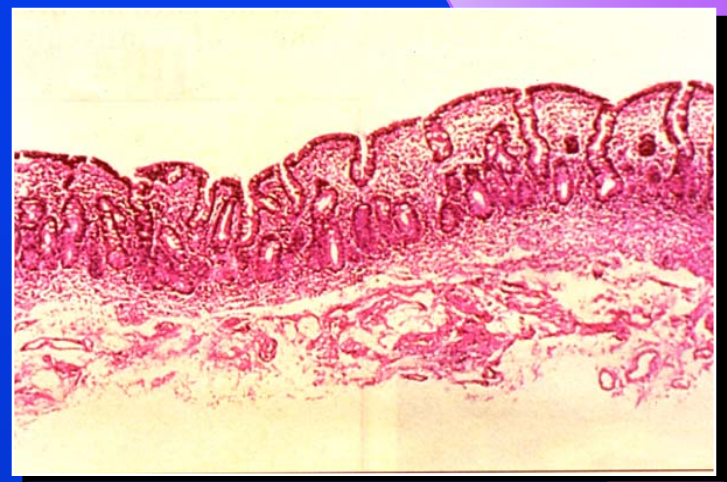
NORMAL MUCOSA



NEGATIVE ANTIBODIES

HEALTHY SUBJECT
TREATED COELIAC

TREATED COELIAC ?
OTHER AUTOIMMUNITY ?



TOTAL ATROPHY

FLORID COELIAC
UNTREATED

POSITIVE ANTIBODIES

ACTUAL PROTOCOL
ANTIBODIES DETERMINATION
(EVIDENCE - BASED)

IgA atTG + **IgA**

+ IgA EmA

INCREASE OF IgA atTG SPECIFICITY

+ IgG atTG

COELIAC DETECTION WITH
IgA DEFFICIENCY

+ IgA AGA

COELIAC DETECTION
IN CHILDRENS < 2 YR

PERSPECTIVE PROTOCOL
ANTIBODIES DETERMINATION
(WORKING HYPOTHESIS)

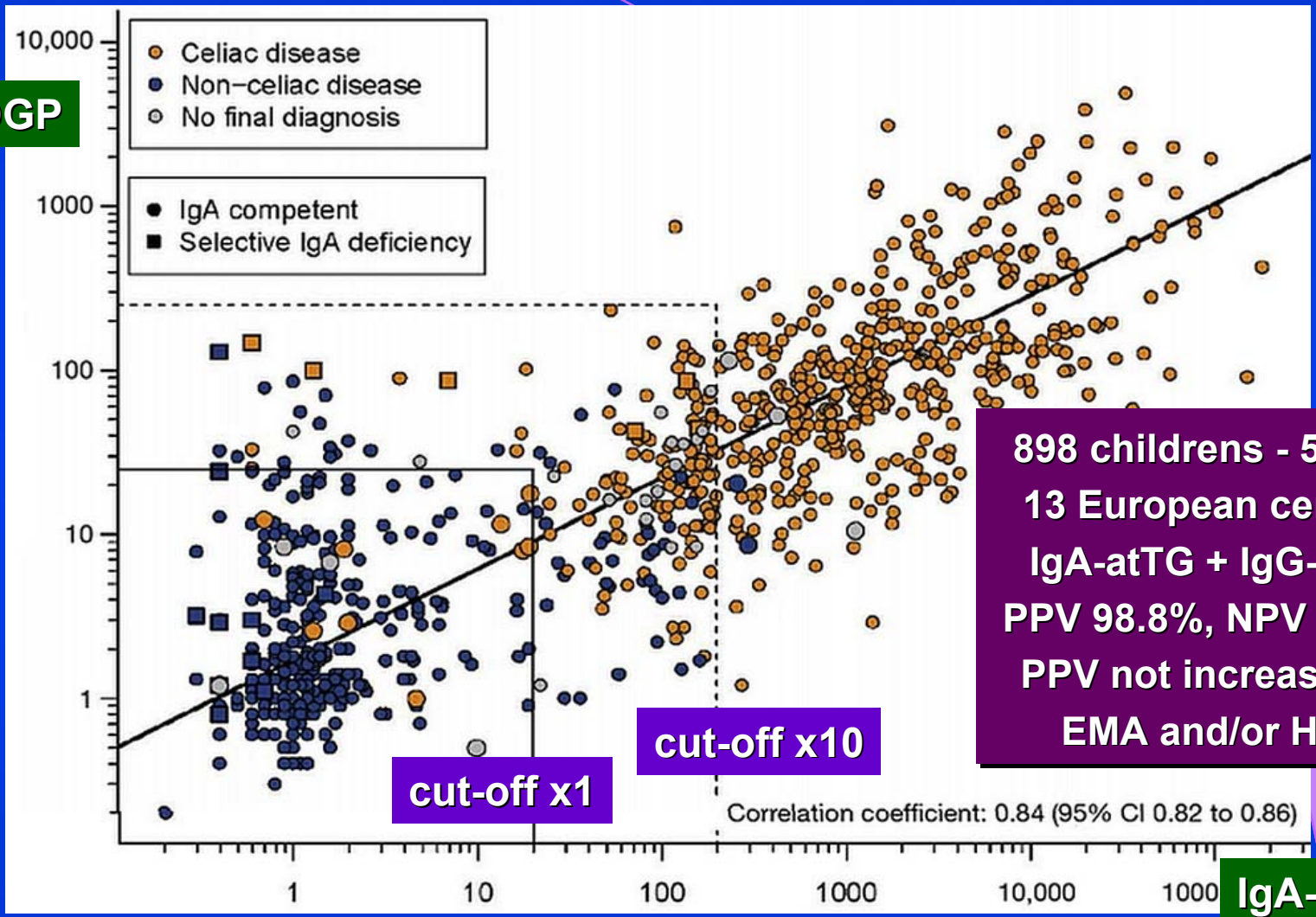
IgA atTG

+ IgG DGP

INCREASE OF IgA atTG SPECIFICITY
COELIAC DETECTION WITH IgA DEFFICIENCY
COELIAC DETECTION IN CHILDRENS < 2 YR

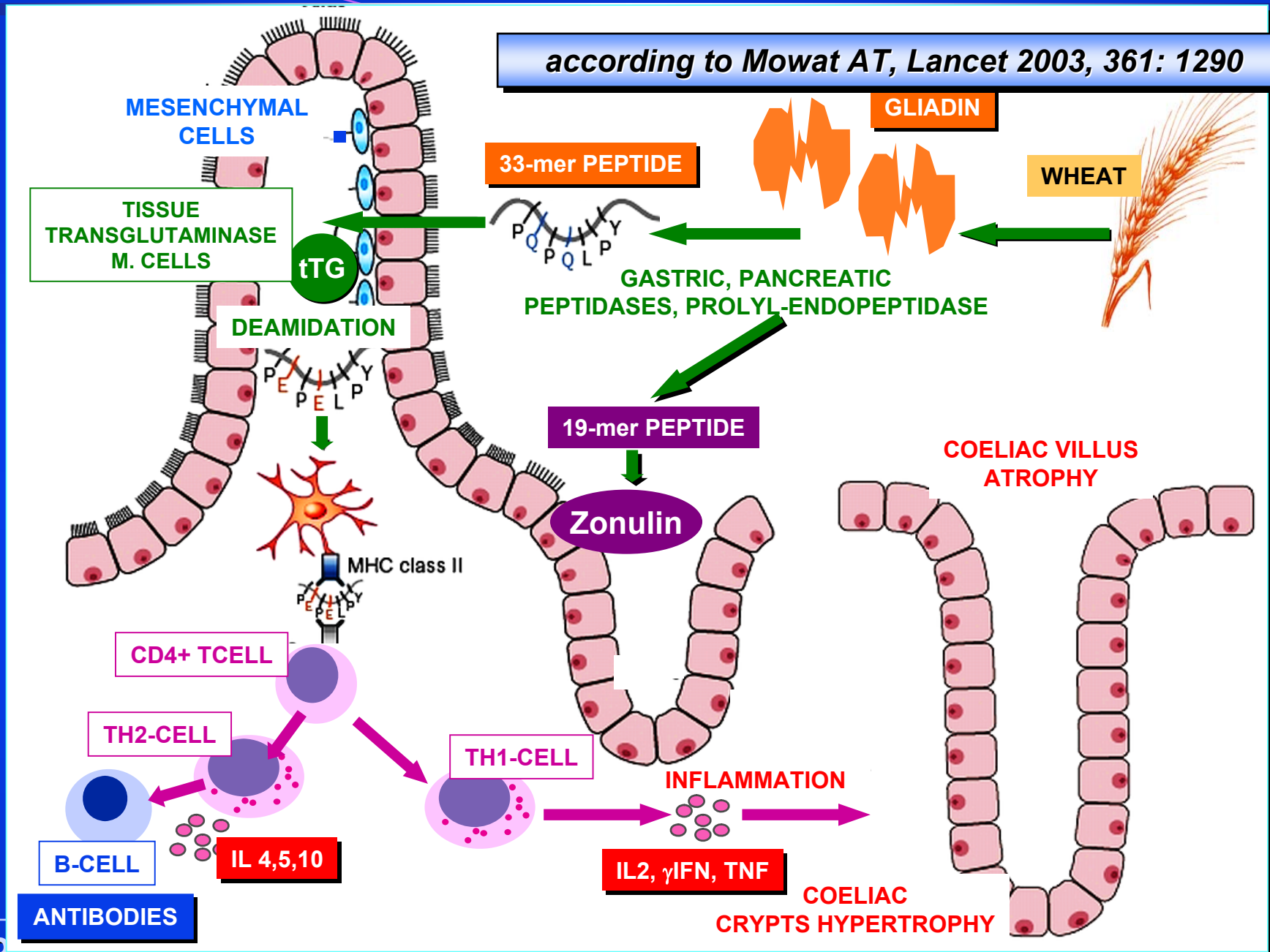
Volta U., Fabbri A., Parisi C. et al. Old and new serological tests for celiac disease screening. Expert Rev. Gastroenterol. Hepatol. 2010, 4(1)

COELIAC MARKERS - atTG, DGP – PEDIATRIC DIAGNOSIS

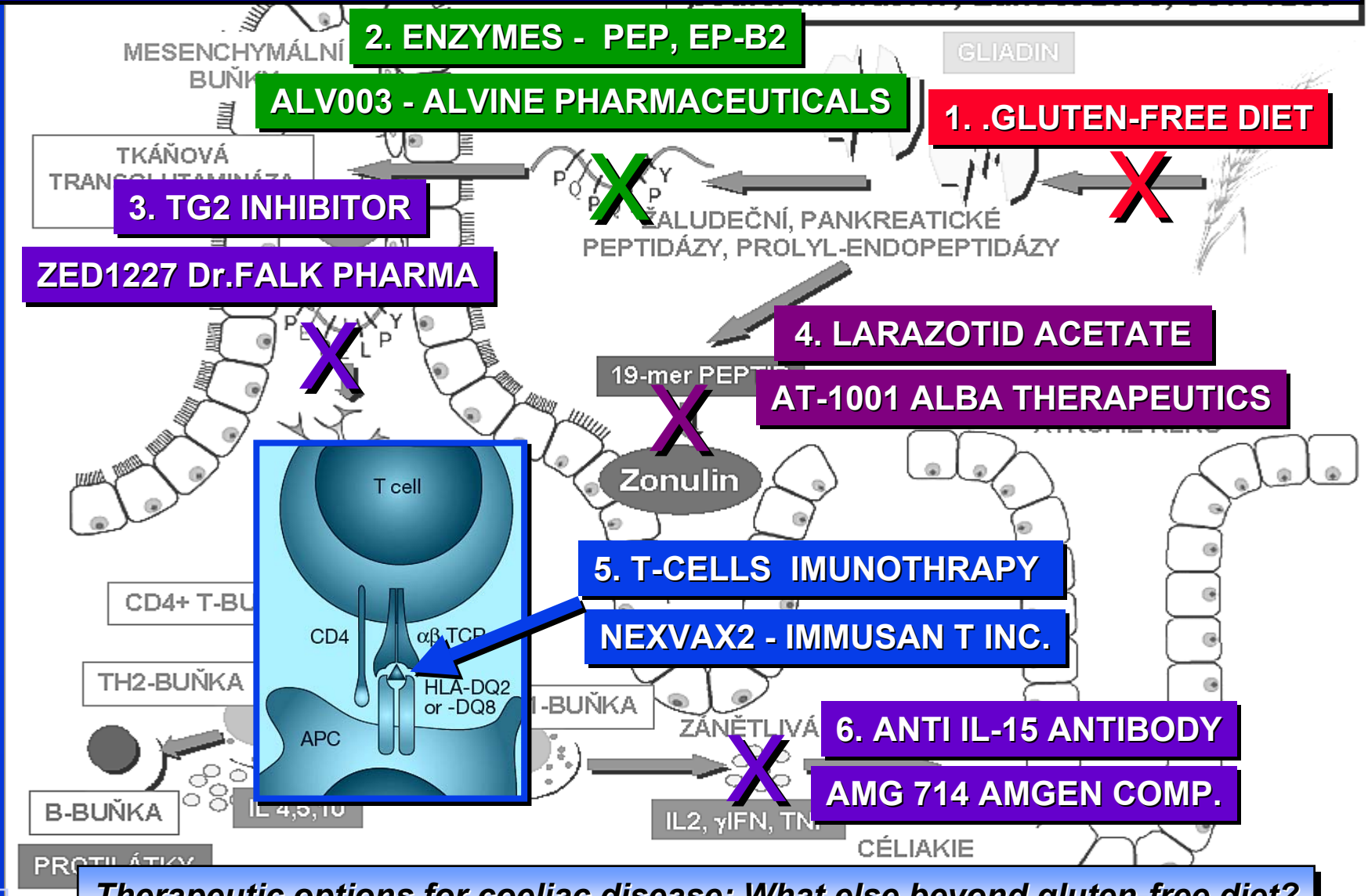


898 childrens - 592 CS
13 European centers
IgA-atTG + IgG-DGP
PPV 98.8%, NPV 95,8%
PPV not increased by
EMA and/or HLA

Wolf J, Petroff D, et al.: Validation of Antibody-Based Strategies for Diagnosis of Pediatric Celiac Disease Without Biopsy. Gastroenterology. 2017;153: 410-419


according to Mowat AT, Lancet 2003, 361: 1290
GLIADIN
WHEAT
33-mer PEPTIDE
MESENCHYMAL CELLS
TISSUE TRANSGLUTAMINASE M. CELLS
tTG
DEAMIDATION
GASTRIC, PANCREATIC PEPTIDASES, PROLYL-ENDOPEPTIDASE
19-mer PEPTIDE
Zonulin
COELIAC VILLUS ATROPHY
MHC class II
CD4+ TCELL
TH2-CELL
TH1-CELL
INFLAMMATION
B-CELL
IL 4,5,10
IL2, γIFN, TNF
ANTIBODIES
COELIAC CRYPTS HYPERTROPHY

THE FUTURE OF COELIAC DISEASE THERAPY



Therapeutic options for coeliac disease: What else beyond gluten-free diet?
Caio G, Ciccocioppo R, Zoli G et al. Dig Liver Dis. 2020; 52(2): 130-137

GLIADIN DETOXIFICATION BY CARICAIN

GLUTEGUARD - CARICA PAPAYA EXTRACT,

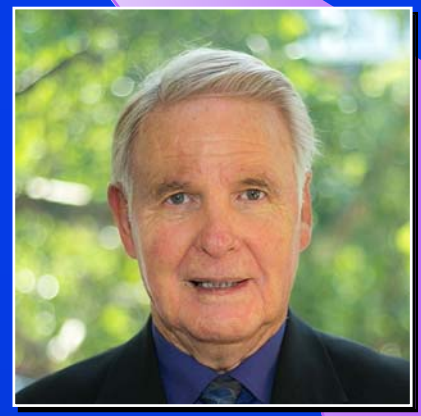
CONTAINS HYDROLYTIC ENZYMES CARICAIN AND OTHER PROLYL-ENDOPEPTIDASES,

NO CELIAC THERAPY, IT'S ONLY FOOD SUPPLEMENTS

PRICE IN AUSTRALIA - 60 TABLETS, 44 AUD

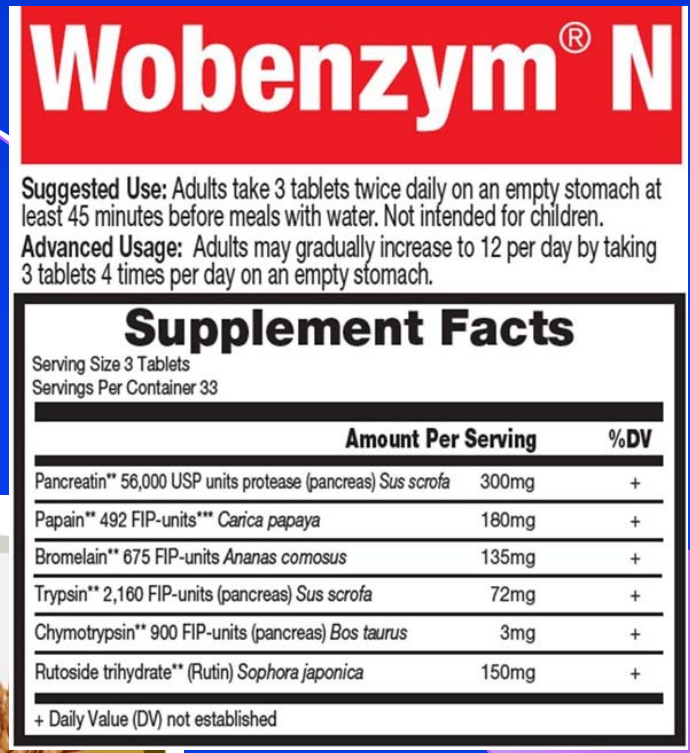
Q Q **P** Y **P** Q **P** Q

CARICAIN
(Carica Papaya.)



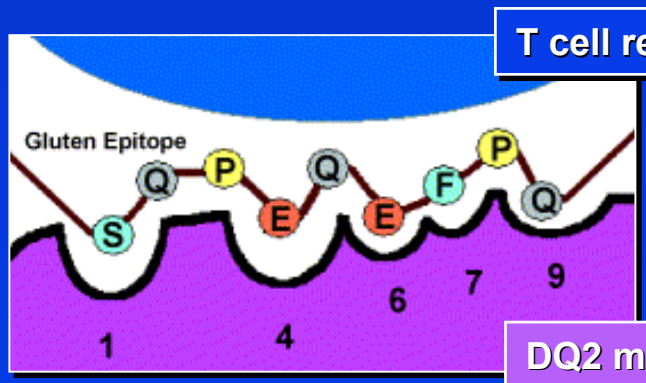
Cornell HJ, Stelmasiak T. The Significance of Key Amino Acid Sequences in the Digestibility and Toxicity of Gliadin Peptides in Celiac Disease. International Journal of Celiac Disease, 2016, Vol. 4, No. 4, 113-120

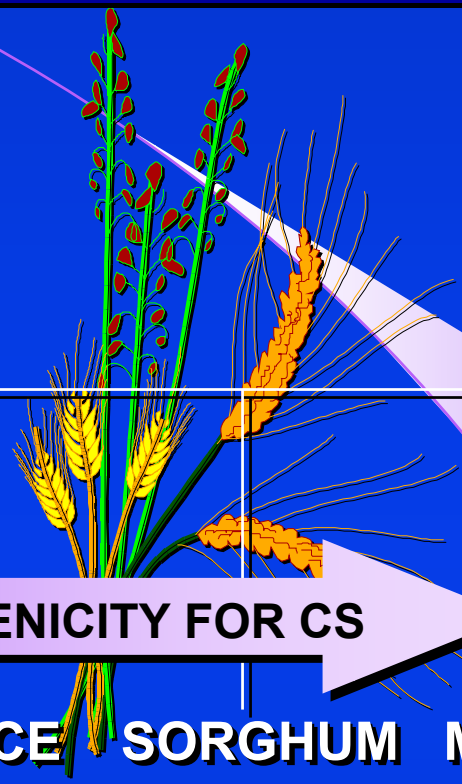
GLUTEN DEGRADING, CLEAVING, FOOD SUPPLEMENTS



FOOD SUPPLEMENTS CONTAINING GLUTEN DEGRADING ENZYMES, DECLARED BY THE MANUFACTURER AS INTENDED FOR PERSONS WITH GLUTEN INTOLERANCE

GLUTEN FREE DIET - CEREALS





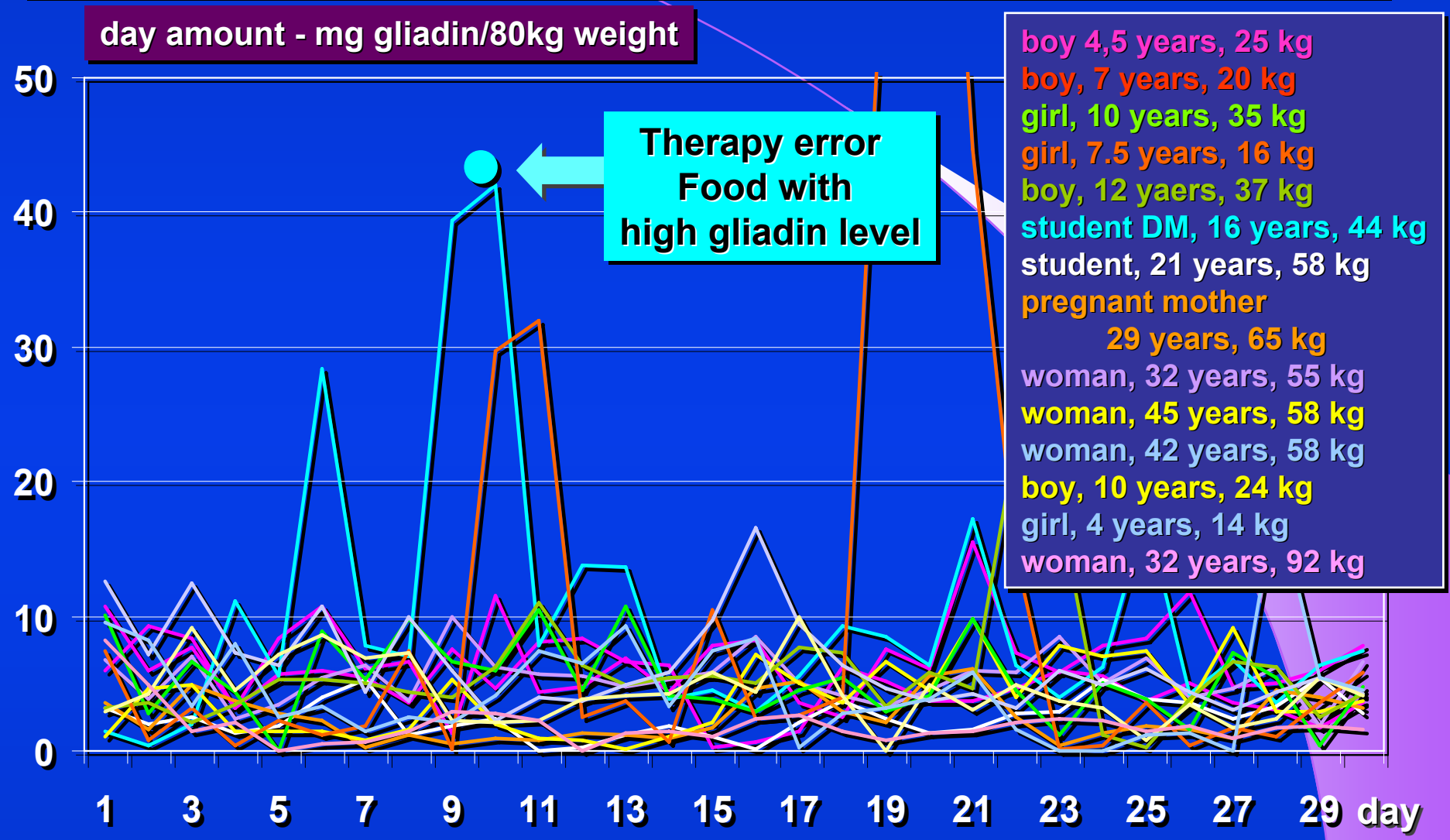
DECREASING PATOGENICITY FOR CS

WHEAT RYE BARLEY OATS RICE SORGHUM MILLET MAIZE

GLIADIN SECALIN HORDEIN AVENIN ZEIN

DECREASING TEST SENSITIVITY

GLUTEN FREE DIET – DAILY GLIADIN INTAKE



Gabrovská D., Kocna P., et al.: Monitoring of Daily Gliadin Intake in Patients on Gluten-free Diets. Prague Medical Report 2011, 112 (1): 5 – 17

CASE: 12-02 - THERAPY

since 11/2005 complete gluten-free diet

2008 gave birth to a healthy daughter, who has not coeliac,

follows the diet - is on remision

CASE: 12-02 - laboratory data

coeliac specific antibodies - 24/4/06:

IgA anti-transglutaminase 2 U/ml

IgA anti-gliadin 7 U/ml

IgG anti-gliadin 29 U/ml

IgA anti-endomysium - negative

COELIAC DISEASE SCREENING - POCT TESTS

RAPID TESTS
FULL BLOOD
POCT ANALYSYS
HOME TESTS

anti-tTG (IgA & IgG)

anti-DGP (IgA &IgG) + celkové IgA

anti-tTG (IgA) + celkové IgA

anti-tTG (IgA, IgG, IgM)

SMALL BOWEL ABSORPTION - FUNCTION TESTS

H_2/CH_4 and ^{13}C - BREATH TESTS

Hydrogen analyser
Lactotest 202

LACTOSE BREATH TEST
20g LACTOSE DOSAGE
HYDROGEN DETERMINATIONS 5 HOURS
CUT-OFF VALUE 20 ppm

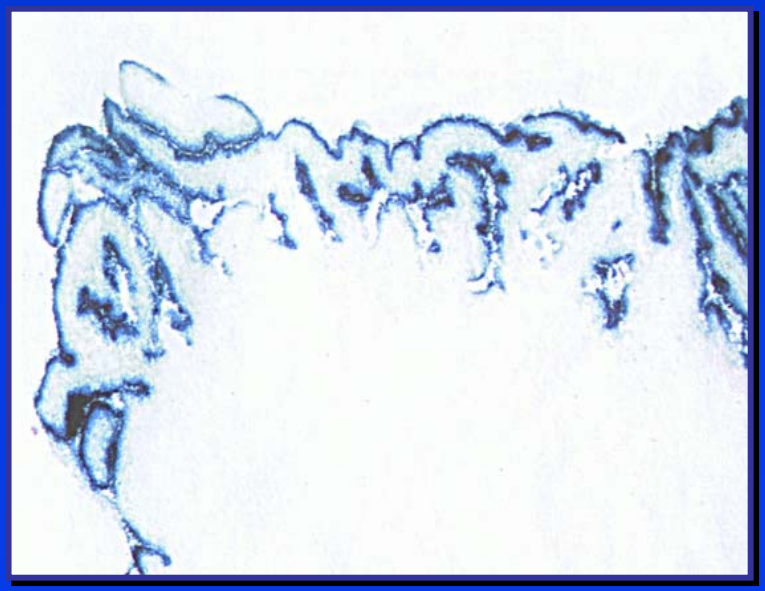
Regression of lactose malabsorption in coeliac patients after receiving a gluten-free diet.
Scand J Gastroenterol. 2008;43(2):174-177

D-XYLOSE BREATH TEST
100mg 13C-XYLOSE DOSAGE
RATIO 12C:13C DETERMINATION
BREATH INDEX 30min/210min

13C-xylose and 14C-xylose breath tests for the diagnosis of coeliac disease.
Scand J Gastroenterol. 2008;43(2):166-173

^{13}C analyser
Heli FAN

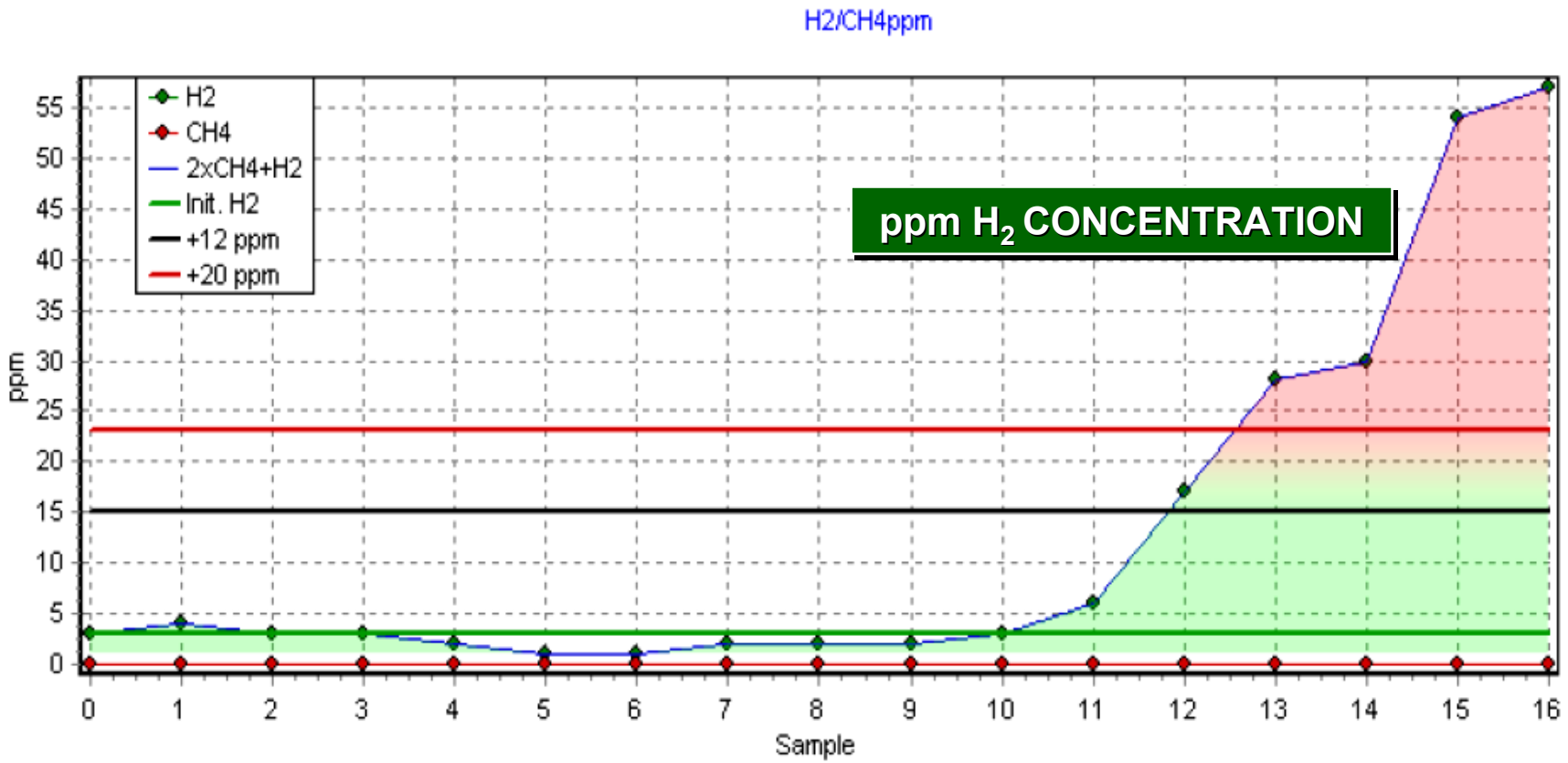
LACTOSE INTOLERANCE DIAGNOSIS



HISTOCHEMICAL DETECTION OF LACTASE ACTIVITY IN THE ENTEROCYTE BRUSH BORDER IMMUNOHISTOCHEMICAL TEST

MODERN RAPID TEST
LACTASE ACTIVITY DETECTION
CHROMOGENIC METHOD

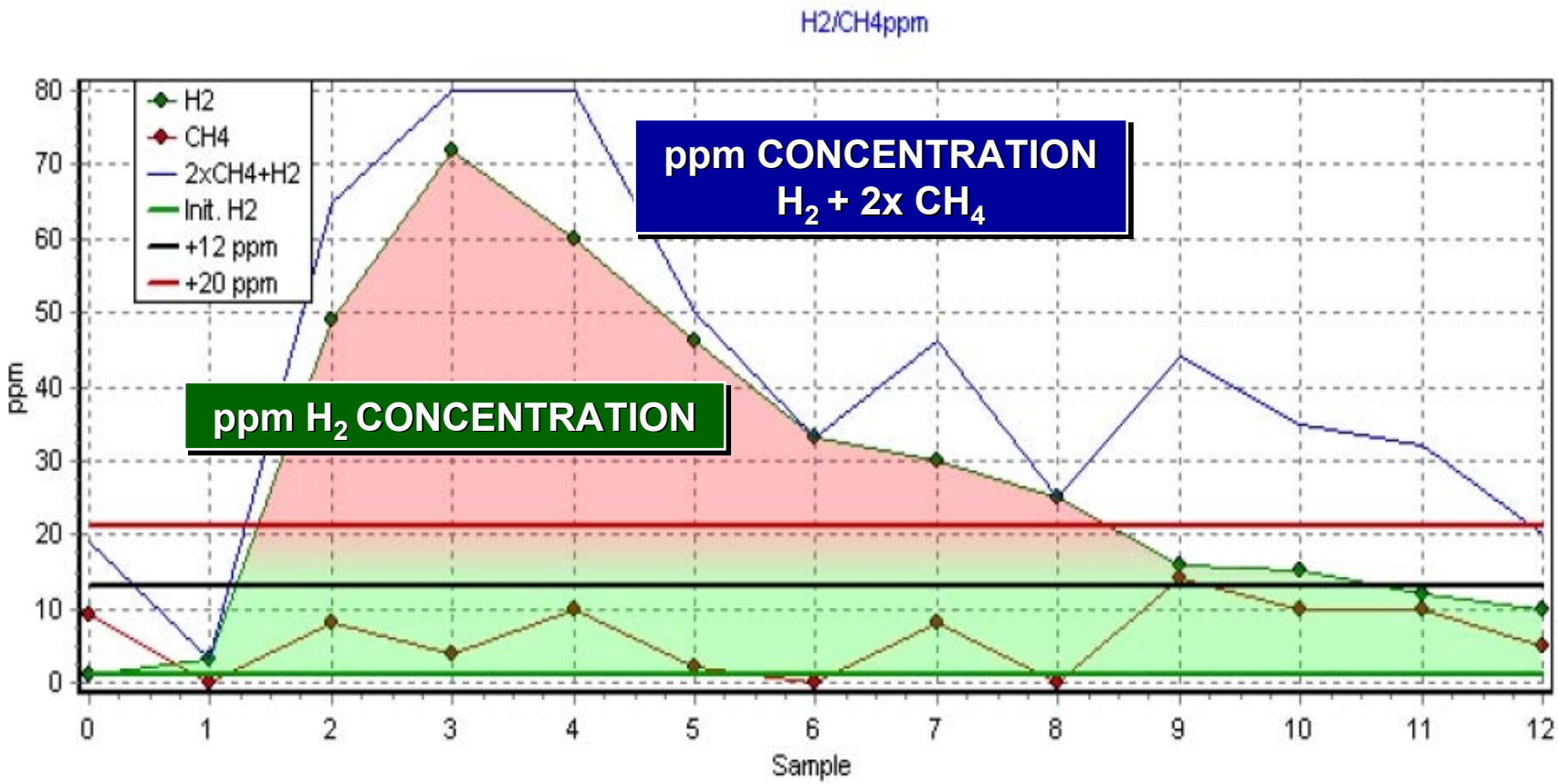
$H_2/CH_4/CO_2$ - LACTOSE INTOLERANCE BREATH TEST



ppm H_2 CONCENTRATION

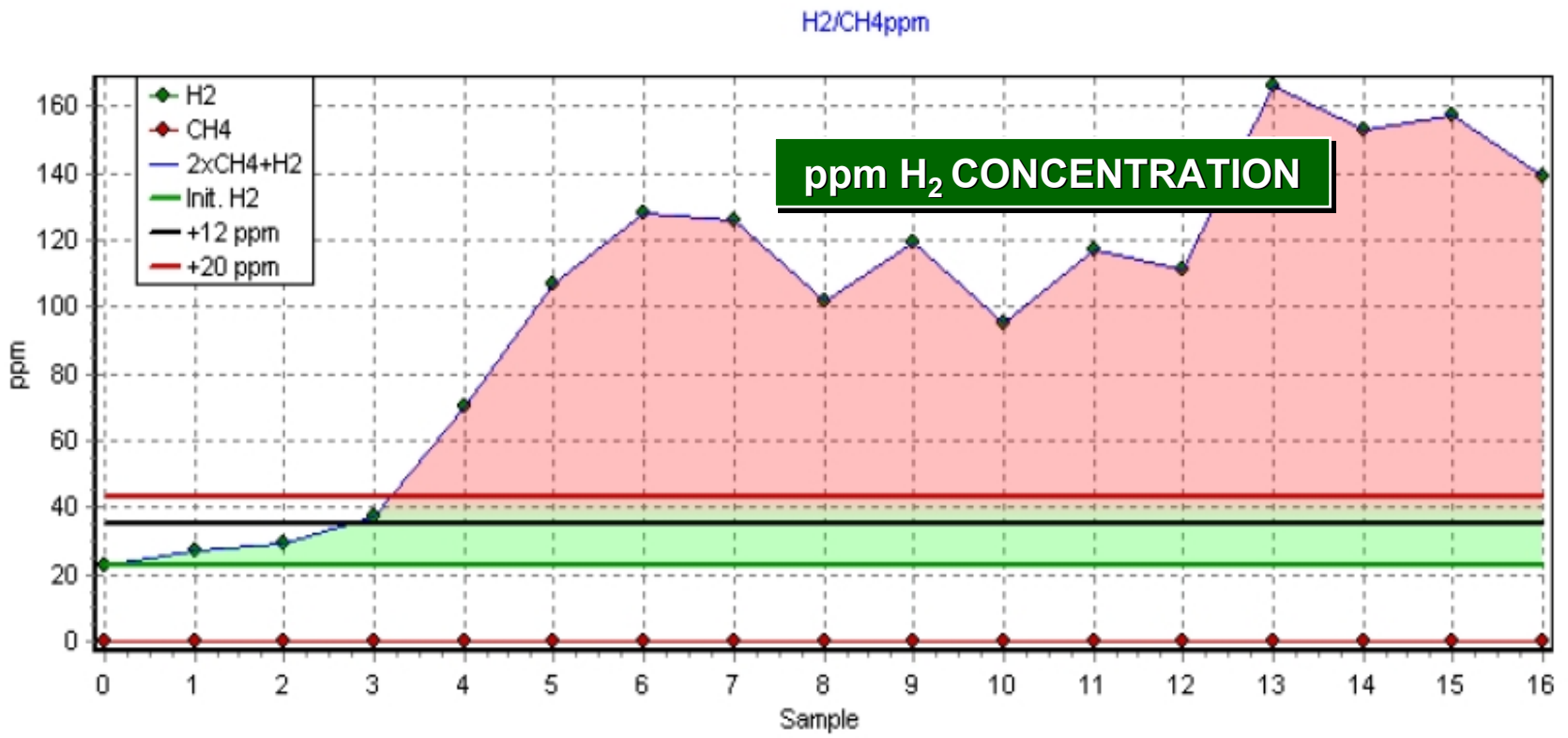
20 g LACTOSE

H_2 /CH_4 /CO_2 - SIBO BREATH TEST



75 g GLUCOSE

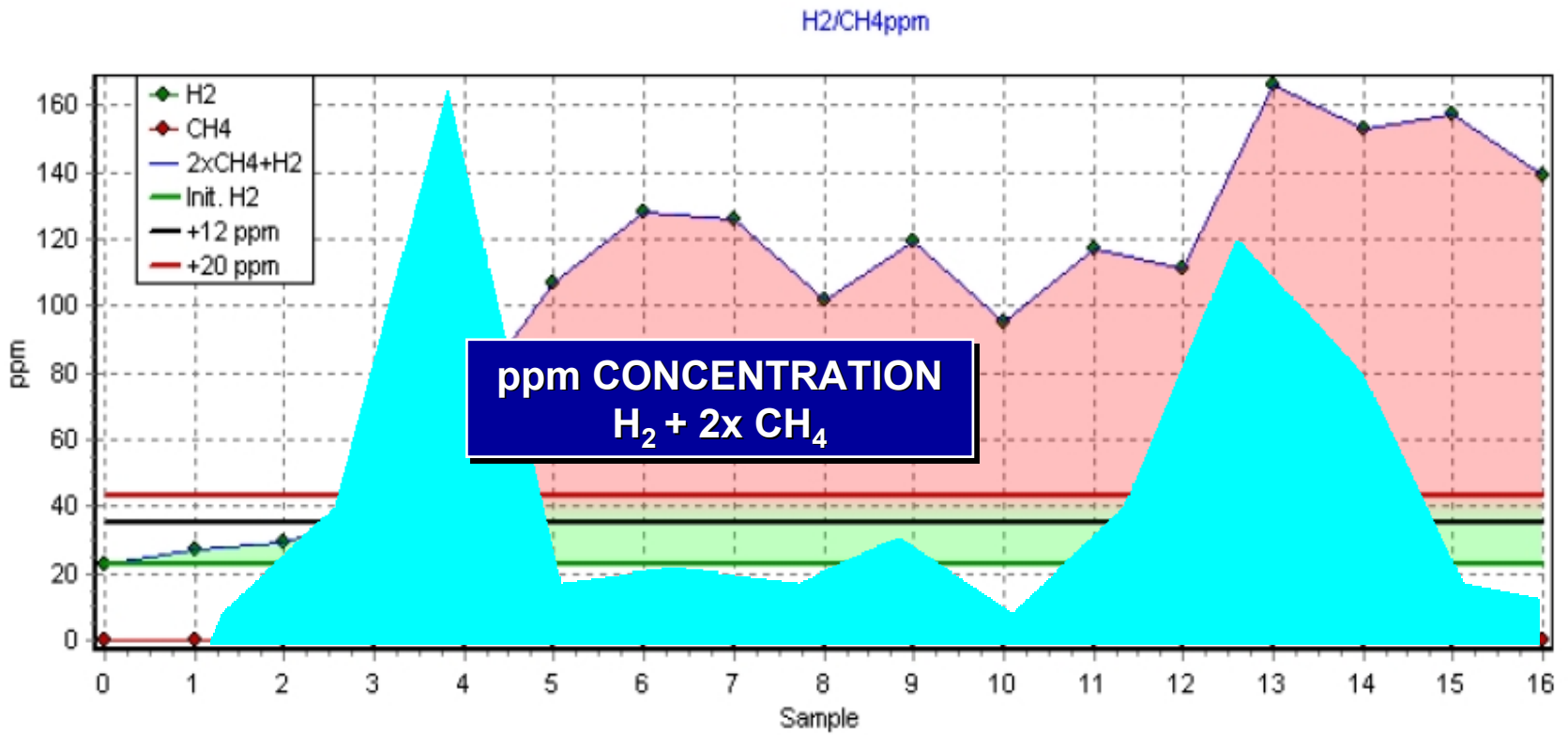
$H_2/CH_4/CO_2$ - LACTOSE INTOLERANCE BREATH TEST



ppm H_2 CONCENTRATION

20 g LACTOSE

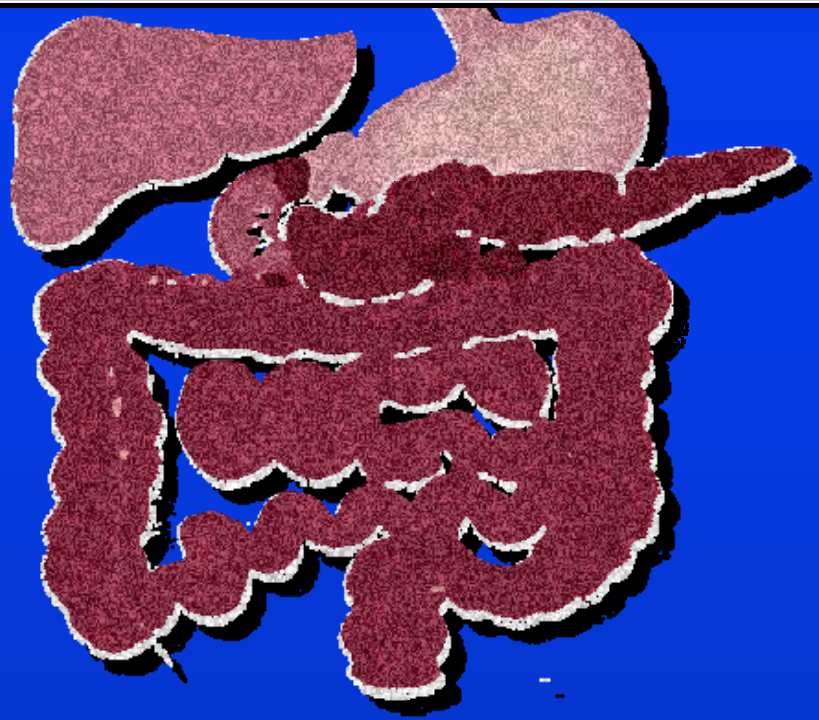
$H_2/CH_4/CO_2$ - SIBO BREATH TEST



ppm CONCENTRATION
H_2 + 2x CH_4

75 g GLUCOSE

HELICOBACTER PYLORI
PEPSINOGENS, GASTRITIS
COELIAC SCREENING - THERAPY
CHRONIC PANCREATITIS
EXOCRINE PANCREATIC FUNCTION
QUANTITATIVE FIT
COLORECTAL CANCER SCREENING



CASE: 12-03

Male - A.A. - born 1938

history of gallbladder problems - (cholecystolithiasis)

hypertension treatment on Ca blockers, obesity

Dietary error - goulash, beer

Abdominal pain around the navel broadening in the back, vomiting

S-amylase 20,2, C-reactive protein 1.day 5 g/l, calcium 1,85 mmol/l

Abdominal ultrasound - cholecystolithiasa

Admitted to surgary clinic – emmergency unit

liquid saturation – 5000 ml/24 hrs

CASE: 12-03

5.day - CT abdomen

Severe acute necrotizing pancreatitis (more than 60%)

ATB administration - cefotaxime 10 days, parenteral nutrition, febricity,

25.day – necrosis drainage under CT

Complications:

Renal insufficiency, borderline cardiac compensation

CASE: 12-03 - laboratory data

	2	3	5	7	45	90
creatinin	130	88	79	73	75	75
urea	9.2	6.6	4.3	6.9	2.5	4.7
albumin	39	27.8	24.5	24.5	20.5	38
Na^+	133	135	135	131 / 135	135	143
K^+	3.7	3.6	3.4	3.4 / 3.9	4.0	4.9
Cl^-	98	103	100	93 / 96	102	104
pH		7.43		7.46 / 7.47		
pCO_2		5.34		6.91 / 5.58		
BE		2.4		10.9 / 6.2		
HCO^-_3		26.3		34.6 / 3.01		

1-2 day dehydratation 7 day metabolic alkalosis

CASE: 12-03

45.day transfer to metabolic unit of 2nd. medical clinic introduced naso-jejunal probe, pulled the drain, gradually increased enteral nutrition to 2200 ml per day (2200 kcal, 85 g protein) Drugs: proton pump inhibitors (omeprazole 2x20 mg), substituted pancreatic enzymes (Creon 25000j 3 x 1 cps), liquid free, probiotics. Conducted training for home enteral nutrition and released to home care

The ICU 52 days, 55 days in the hospital, then home enteral nutrition 93 days, gradual transfer to oral intake. Proton pump inhibitors discontinued, and patient gradually discontinued probiotics.

CASE: 12-03 - laboratory data

After 1,5 year executed exocrine pancreatic secretion tests :

FELA (fecal elastase-1) 378 μg/g (normal above 200 μg/g)

^{13}C-MTG breath test, 6hr. cPDR - 51 % (normal above 30 %)

Pancreatic enzyme substitution discontinued,
at this time gall diet without pancreatic substitution.

Chronic pancreatitis - evidence based guidelines

Which test is clinically indicated
for diagnosing exocrine pancreatic insufficiency (PEI) ?
Statement 3-6. In a clinical setting, **a non-invasive pancreatic function test (PFT) should be performed.** The **FE-1 test** is feasible and widely available and is therefore most frequently used in this setting, while the **13C mixed triglyceride** breath test (13C-MTG-BT) offers an alternative. The s-MRCP test may also be used as an indicator of PEI but provides only semiquantitative data.
(Grade 1B, agreement)

Is a pancreatic function test required for the diagnosis of CP?
Statement 3-7. A function test is required for the diagnosis of CP.
(Grade 2B, strong agreement)

Should a pancreatic function test be performed at the time of diagnosis?
Statement 3-8. Every patient with a new diagnosis of CP
should be screened for PEI. (Grade 1A, strong agreement)

Löhr M. - HaPanEU/UEG Working Group, UEG Journal, 2017, Vol. 5(2) 153–199
United European Gastroenterology evidence based guidelines for the diagnosis and therapy of chronic pancreatitis (HaPanEU)

QUANTITATIVE STOOL FAT ANALYSIS

STOOL SAMPLING - 72hr.

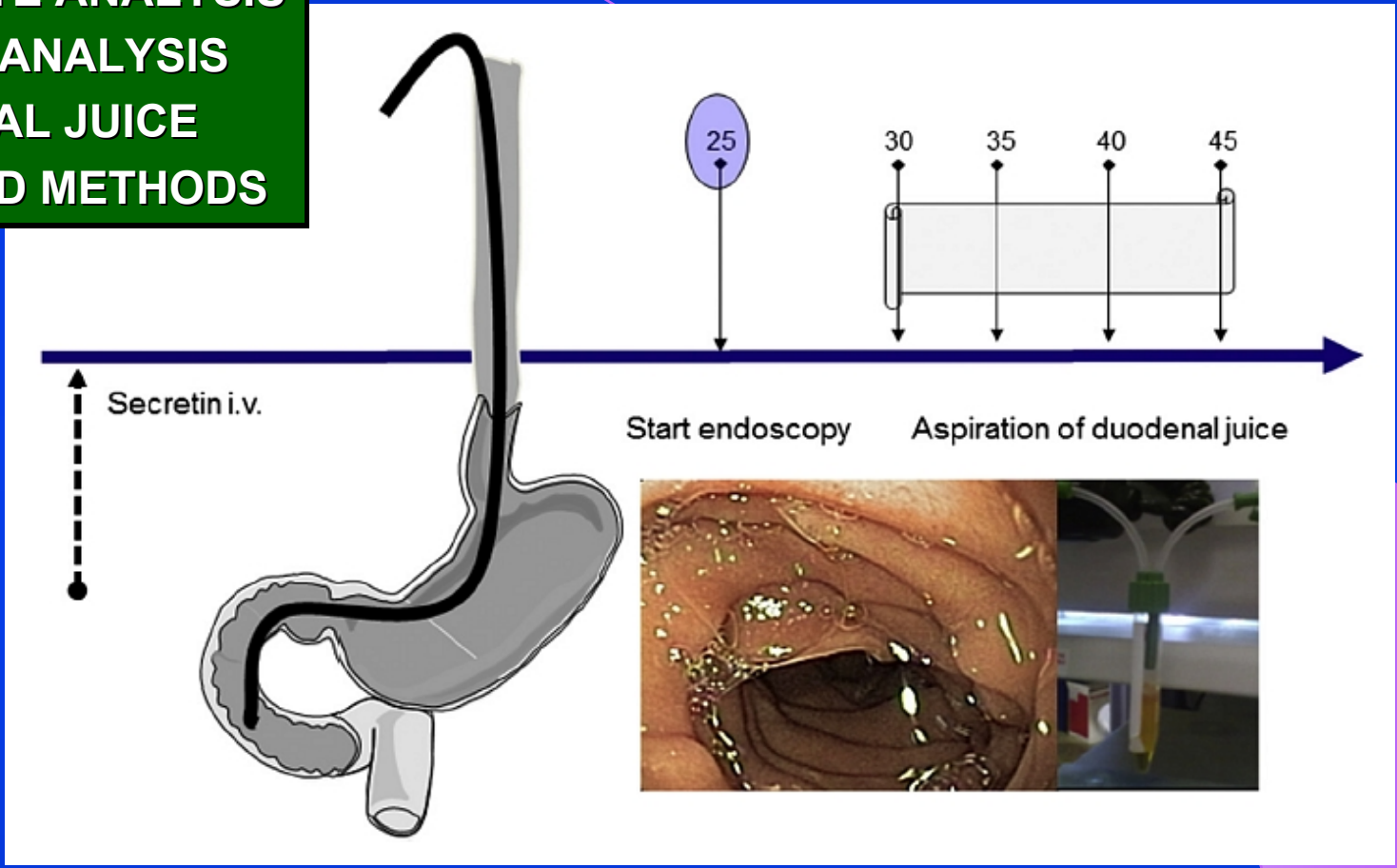
STANDARD METHOD FOR EXOCRINE PANCREATIC FUNCTION

FAT 72 hr.

S-CCK TEST

SHORT ENDOSCOPIC SECRETIN TEST

BICARBONATE ANALYSIS
AMYLASE ANALYSIS
DUODENAL JUICE
AUTOMATIED METHODS



Erchinger F, Engjom T, Gudbrandsen OA et al.:
Automated spectrophotometric bicarbonate analysis in duodenal juice compared to the back titration method. Pancreatology. 2016; 16(2): 231-237

EXOCRINE PANCREATIC FUNCTION TESTS

PERORAL ADMINISTRATION

INDIRECT STIMULATION

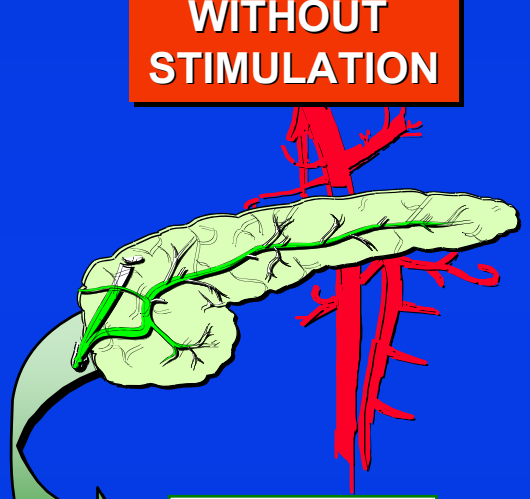
STIMULATING MEAL

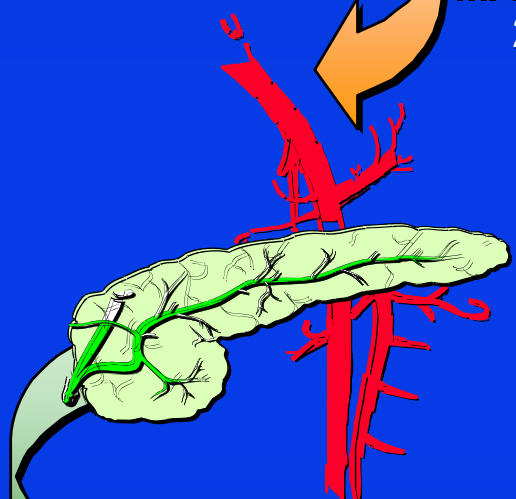
SUBSTRATE

SUBSTITUTION THERAPY

MAIZE BREAD
20g FAT

WITHOUT STIMULATION





^{13}C-MARKER ANALYSIS

250mg ^{13}C-MTG

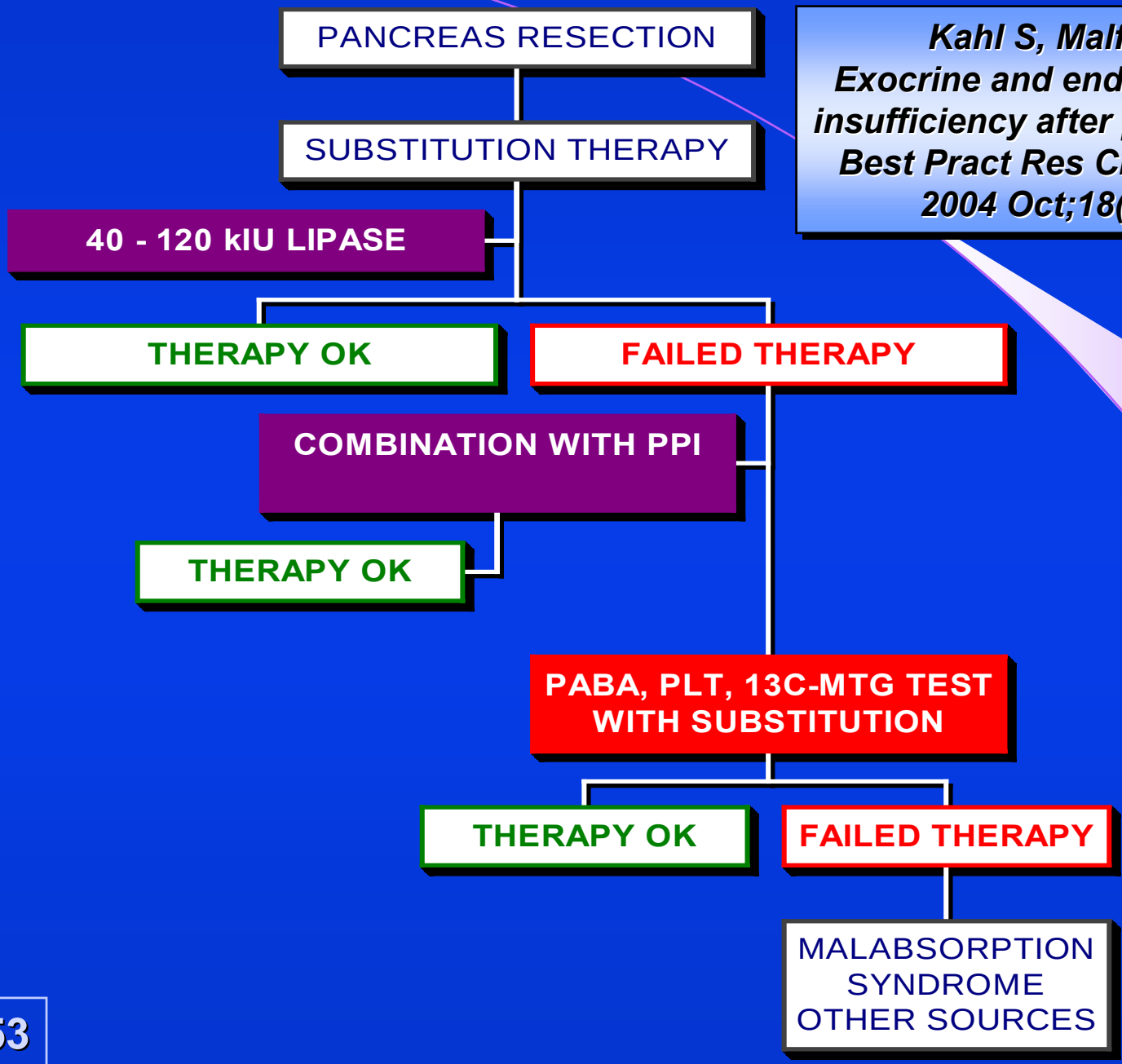
FECAL ELASTASE

PANCREATIC LIPASE

DRUG LIPASE

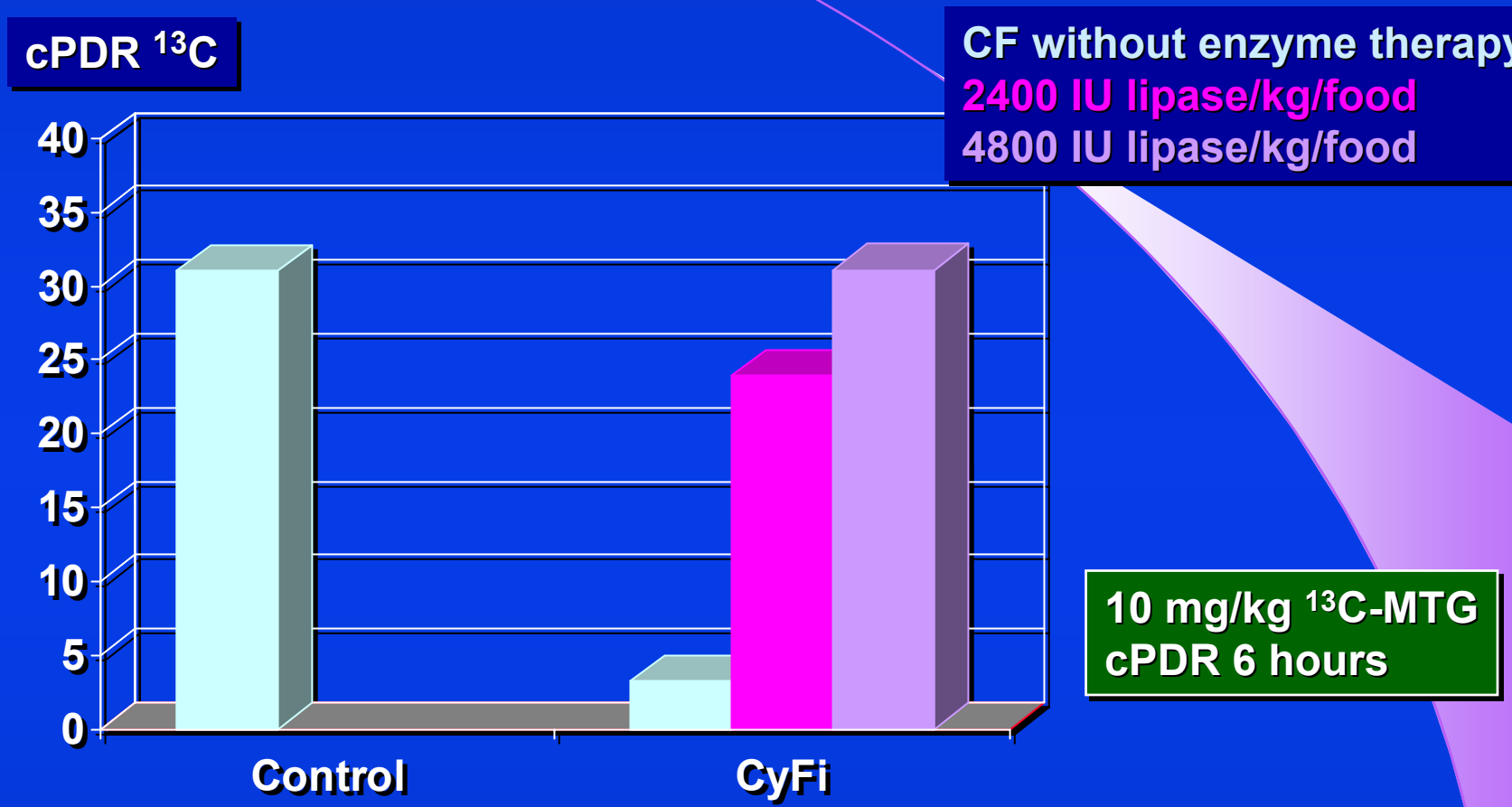
SECRETORY CAPACITY GRADING CHP

DIGESTIVE FUNCTION OF (LIPID) DIGESTION



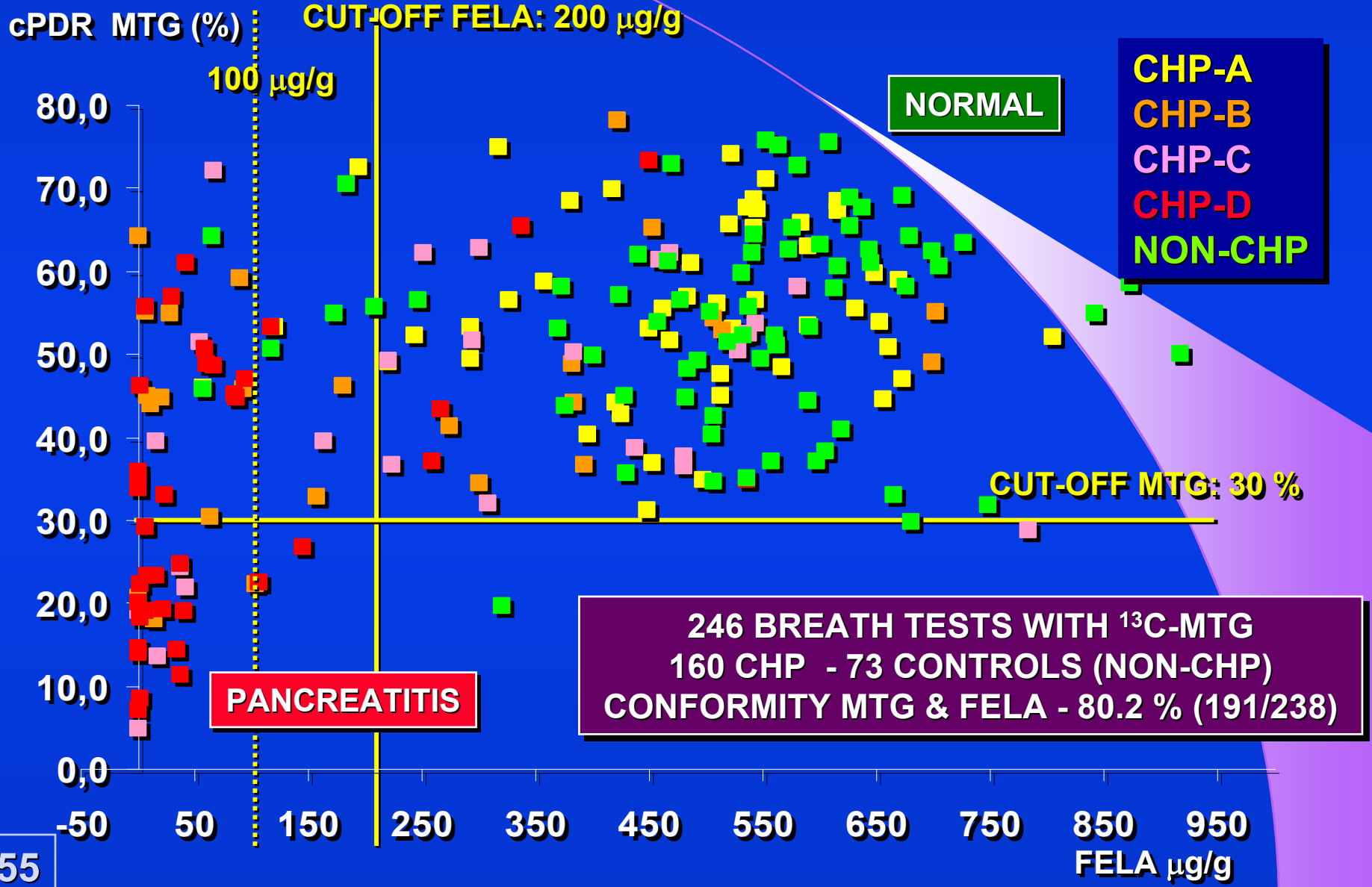
Kahl S, Malfertheiner P. Exocrine and endocrine pancreatic insufficiency after pancreatic surgery. Best Pract Res Clin Gastroenterol. 2004 Oct;18(5):947-55.

^{13}C-MTG - BREATH TEST WITH MIXED TRIGLYCERIDE

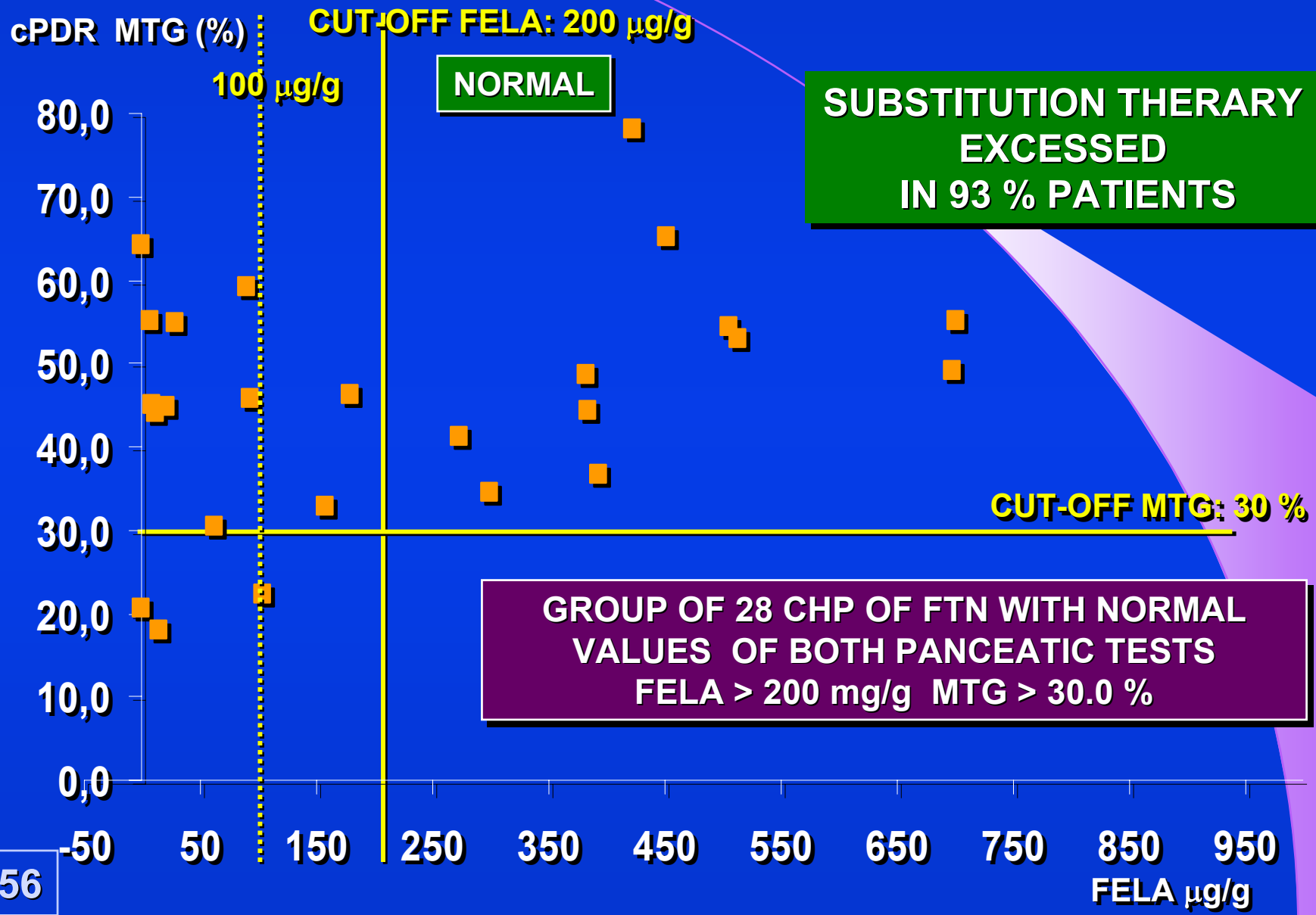


13Carbon mixed triglyceride breath test
and pancreatic enzyme supplementation in cystic fibrosis
Amarri S. et al.: Archives of Disease in Childhood 1997; 76: 349–351

^{13}C-MTG - BREATH TEST & FECAL ELASTASE



^{13}C-MTG - BREATH TEST & FECAL ELASTASE



HELICOBACTER PYLORI
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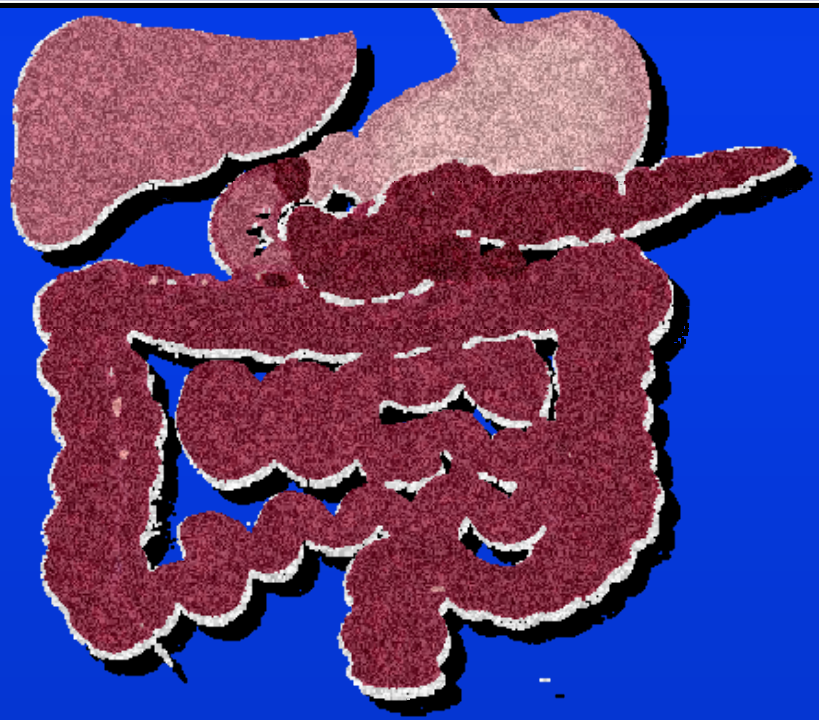
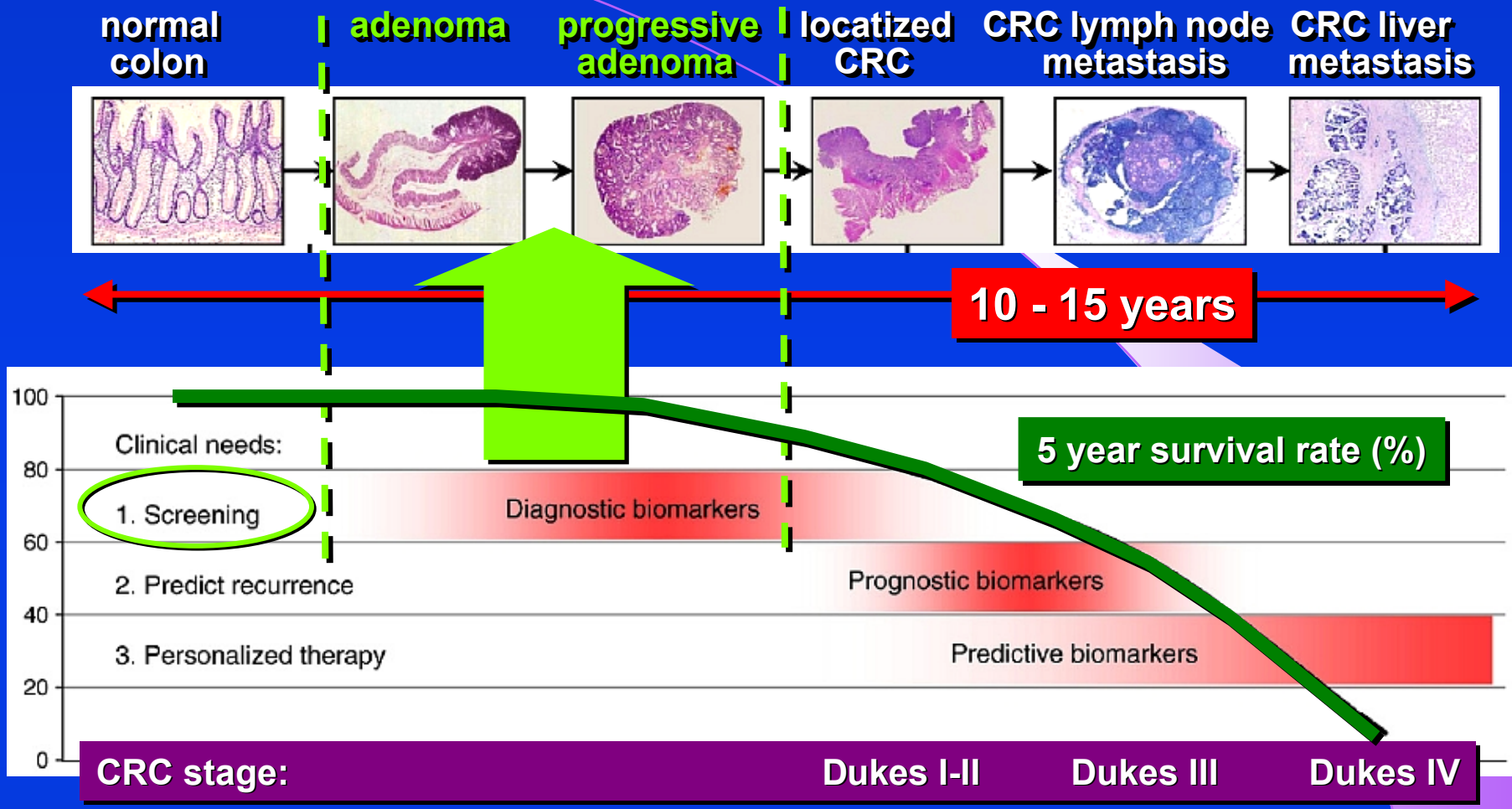


- Colorectal carcinoma is the most common tumor of the GE tract
- In the Czech Republic (2017) was diagnosed 7439 subjects with CRC, on CRC died 3685 patients, more than 50% of the mortality is due to the high proportion of patients diagnosed in advanced stages III and IV
- Screening over 50 years - the target population in the Czech Republic 2017 - includes 4,056 641 subjects
- FOBT/TOKS screening test was carried out in 2015/16 in 1 202 628 persons, ie. 29.6%
- FOBT/TOKS + indicated colonoscopy in 2017 found only 846 CRC of 8136 diagnosed CRC, which is only 11.3%

Suchanek S., Majek O., Vojtechova G., Minarikova P., Rotnaglova B., Seifert B., Minarik M., Kozeny P., Dusek L., Zavoral M.: Colorectal cancer prevention in the Czech Republic: time trends in performance indicators and current situation after 10 years of screening
European Journal of Cancer Prevention 2014, 23:18–26



Proteomics of colorectal cancer: overview of discovery studies and identification of commonly identified cancer-associated proteins and candidate CRC serum markers. Jimenez CR, Knol JC, Meijer GA, Fijneman RJ. - J Proteomics. 2010;73:1873-1895

FECAL OCCULT BLOOD TEST- FOBT/TOKS (in Czech)

J Med Screen. 2002;9(3):99-103. Basic variables at different positivity thresholds of a quantitative immunochemical test for faecal occult blood. Castiglione G, Grazzini G, Miccinesi G, Rubeca T, Sani C, Turco P, Zappa M.

2005

qi-FOBT - 3.generation

1990

i-FOBT - 2.generation

1975

g-FOBT - 1.generation

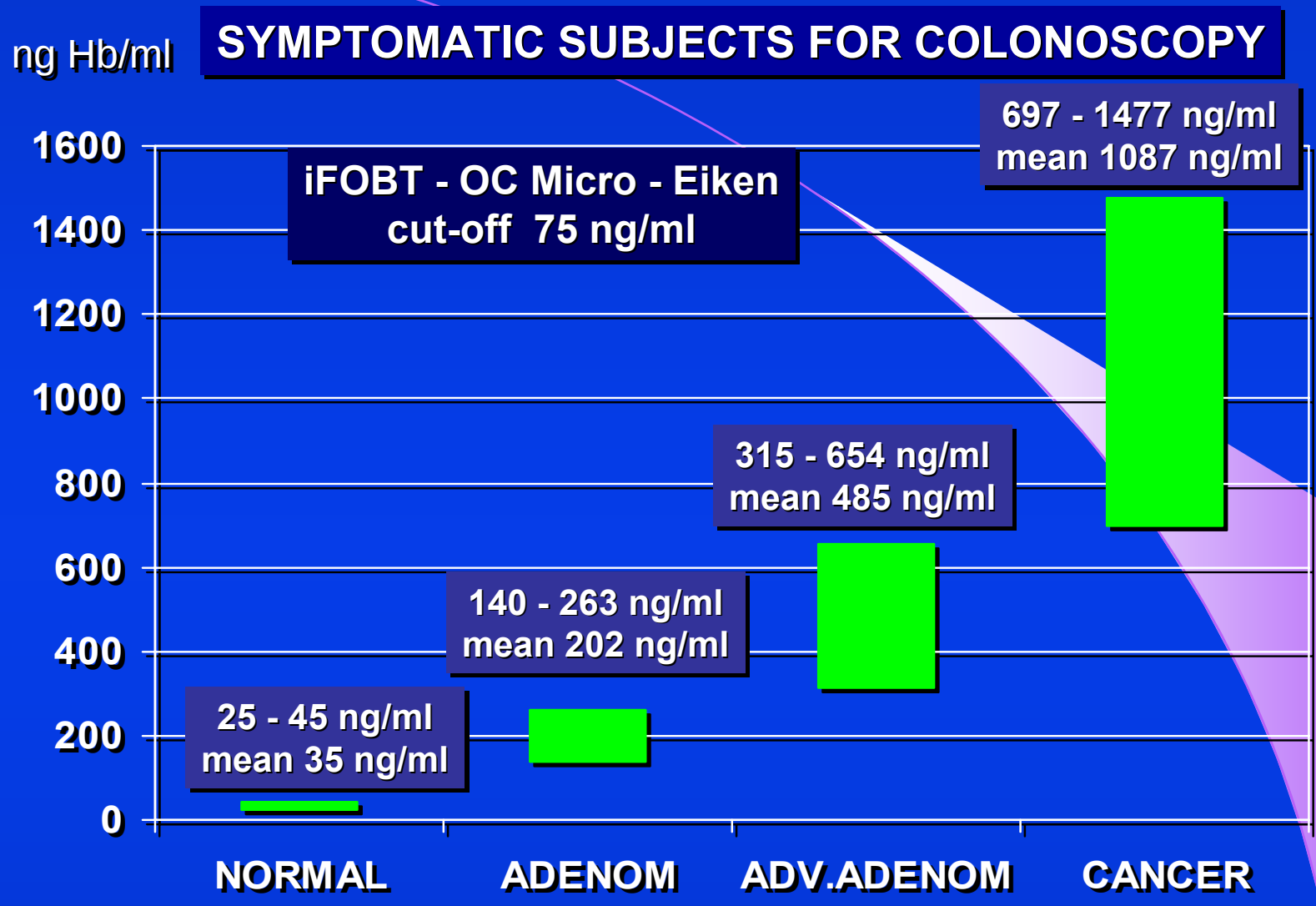
Schweiz Med Wochenschr. 1976 Feb 28;106(9):297
The hemoccult test in the screening for colonic carcinoma
Deyhle P, Nüesch HJ, Kobler E, Jenny S, Säuberli H.

QUALITATIVE FIT METHODS, RAPID TESTS - POCT

German study - Dtsch Med Wochenschr - 05/2016

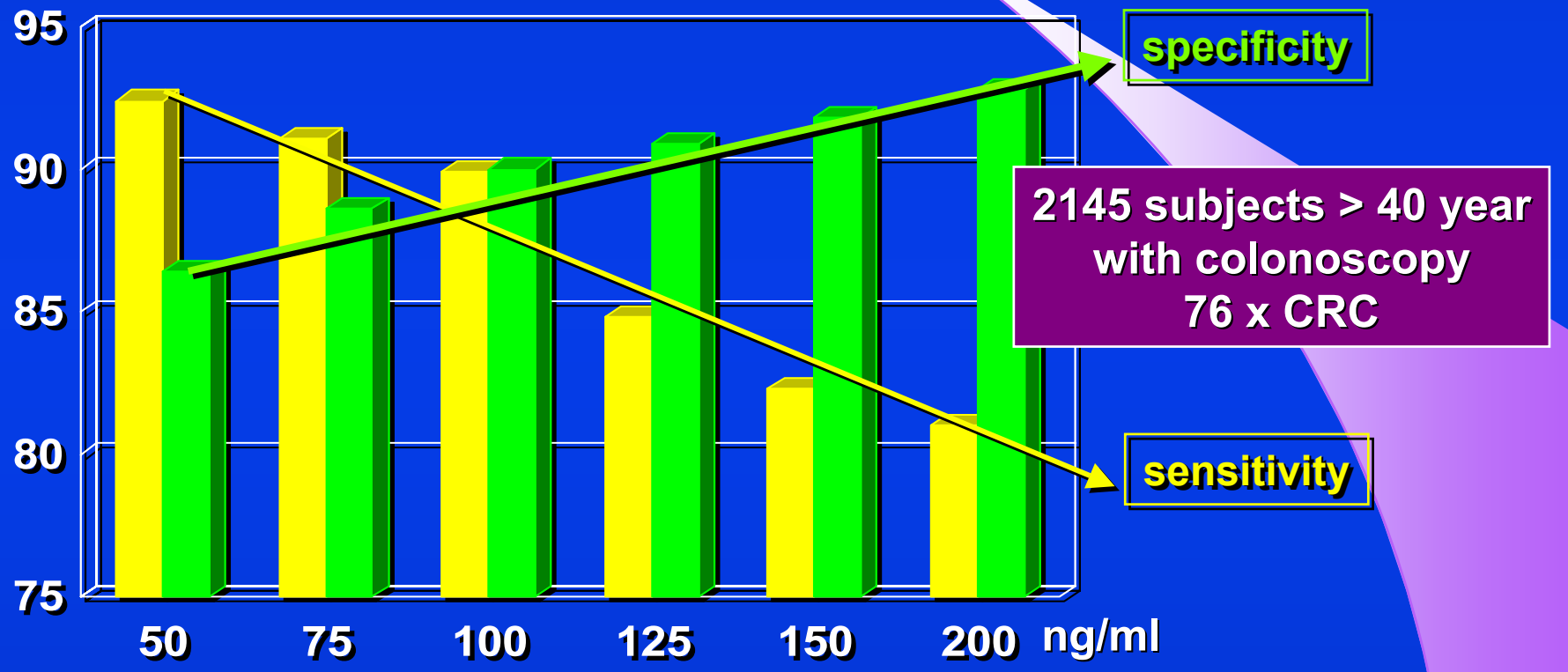
- There are different FITs on the market,
  namely qualitative FITs (point-of-care tests) and quantitative FITs.
- European Guidelines for quality assurance in colorectal cancer screening
  only recommend quantitative FITs
- The use of qualitative FITs is not a tenable option for a
  quality-assured screening program.

Haug U., Becker N. Dtsch med Wochenschr 2016; 141(10): 729-731
Immunochemical fecal occult blood tests for colorectal cancer screening: Point-of-care tests are not tenable for a quality-assured program



Levi Z.,Rozen P.,Hazazi R.,Vilkin A.,Waked A.,Maoz E.,Birkenfeld S.,Leshno M.,Niv Y.
Ann Intern Med. 2007;146:244-255
A Quantitative Immunochemical Fecal Occult Blood Test for Colorectal Neoplasia

Optimization of qFIT cut-off, for indication to colonoscopy:
Indicate as much as possible, all pathology - with 15% healthy subjects ?
NOT indicate healthy subjects, but decrease sensitivity about 15% ?



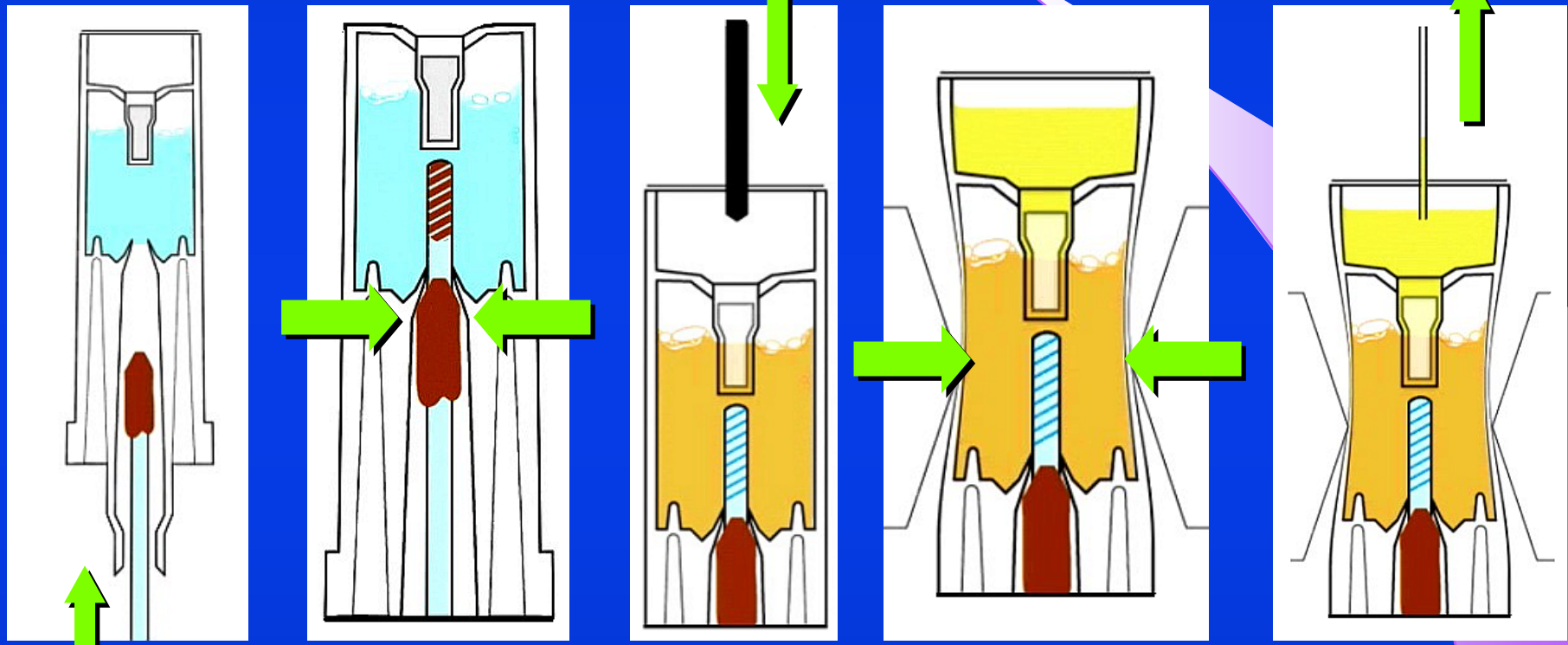
Higher Fecal Immunochemical Test Cutoff Levels
Terhaar sive Droste JS et al. Cancer Epidemiol Biomarkers Prev. 2011; 20(2)

SAMPLINS SYSTEM - OC SENSOR μ

STOOL SAMPLE INSERT

ALUMINIUM FOIL PERFORATION

25 μl INJECT TO CUVETTE



TRANSFER of 10 mg STOOL SAMPLE

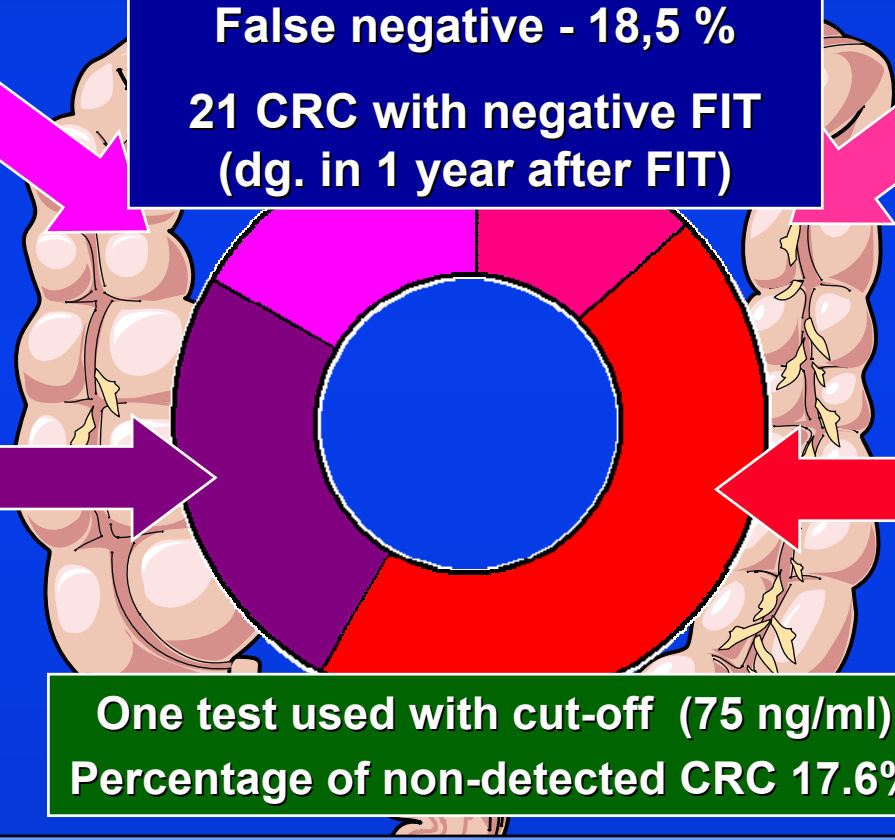
FILTRATION OF SAMPLE EXTRACT

CRC TUMOUR POSITION - FALSE NEGATIVE

113 CRC in VFN hospital

Sensitivity for CRC - 81,5 %
False negative - 18,5 %

21 CRC with negative FIT
(dg. in 1 year after FIT)



4/24
18.1%

4/14
28.5%

3/24
12.5%

10/53
18.8%

One test used with cut-off (75 ng/ml)
Percentage of non-detected CRC 17.6%

Kelley L, Swan N, Hughes DJ. - Colorectal Dis. 2013 Sep; 15(9): e512-21
An analysis of the duplicate testing strategy of an Irish immunochemical FOBT colorectal cancer screening programme

INTEGRATION OF CRC RISK FACTORS

Guideline ACS 2018 - CRC screening > 45 years
Colorectal cancer screening for average-risk adults: 2018 guideline update from the American Cancer Society. CA Cancer J Clin 2018;68:250-281.

Age is important, but also several other factors, such as gender, first-degree relationship with CRC, high body mass index (BMI), metabolic syndrome, cigarette smoking, diet, use of certain drugs (aspirin, nonsteroidal anti-inflammatory drugs, hormone replacement therapy) and adherence.

The disadvantage is the inability to integrate these factors into personalized screening.

Clin Gastroenterol Hepatol. 10/2018

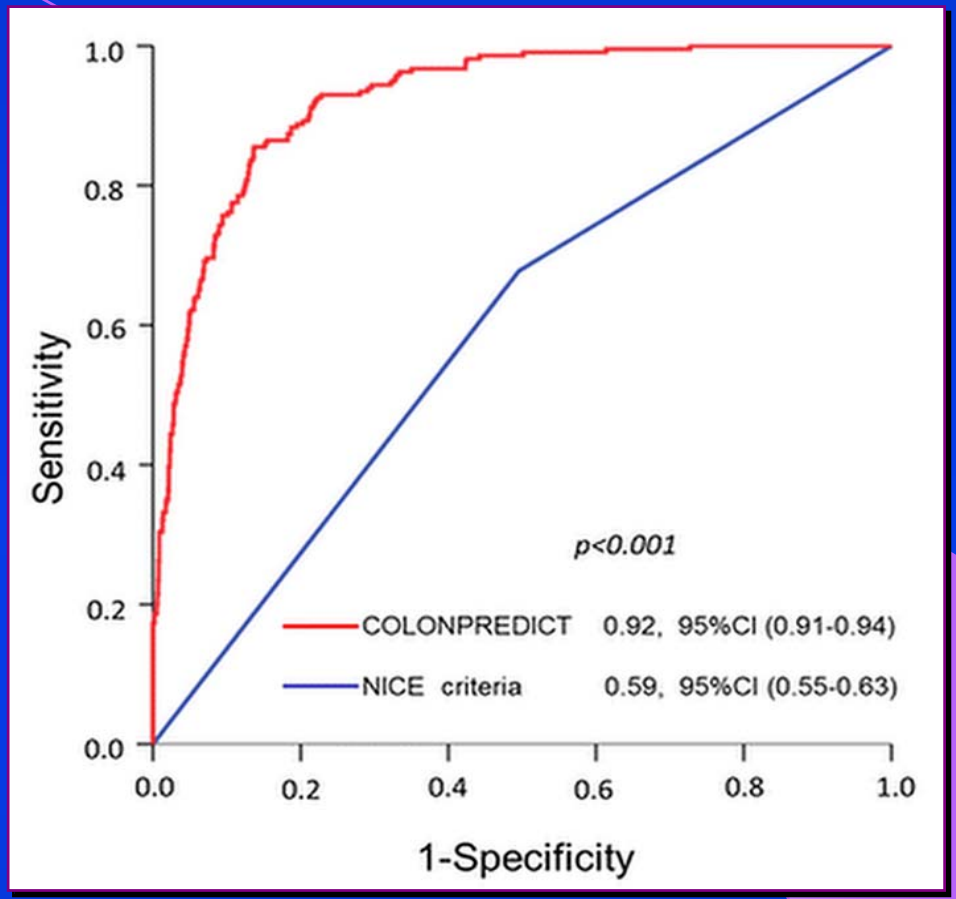
Lowering the Starting Age for Colorectal Cancer Screening to 45 Years: Who Will Come…and Should They? Imperiale TF, Kahi CJ, Rex DK.: Clin Gastroenterol Hepatol. 2018 (10):1541-1544

CRC PREDICTION MODEL - COLONPREDICT

Prediction model with 11 variable

Characteristics	OR
Age (years)	1.04
Sex (male)	2.2
Hb - fecal ≥ 20 µg/g	17.0
Hb - blood < 10 g/dl	4.8
CEA ≥ 3 ng/ml	4.5
Colonoscopy in 10 years	0.1
Rectal bleeding	2.2
Change in bowel habit	1.7

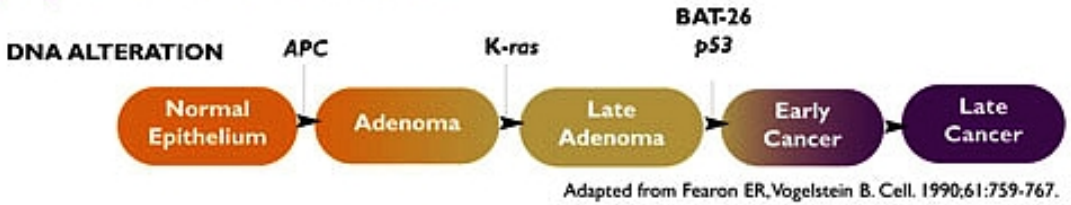
Low risk	value	< 3.5
Intermediate risk	value	3.5 - 5.6
High risk	value	≥ 5.6



Development and external validation of a faecal immunochemical test-based prediction model for colorectal cancer detection in symptomatic patients
Cubiella J, Vega P, Salve M. et al. BMC Medicine 2016, 14:128

MOLECULAR BIOLOGY
DNA CHIPs FOR COLORECTAL CANCER SCREENING

Colorectal cancer develops in well-defined stages and arises from molecular alterations in multiple genes within an individual cell.



Adapted from Fearon ER, Vogelstein B. Cell. 1990;61:759-767.

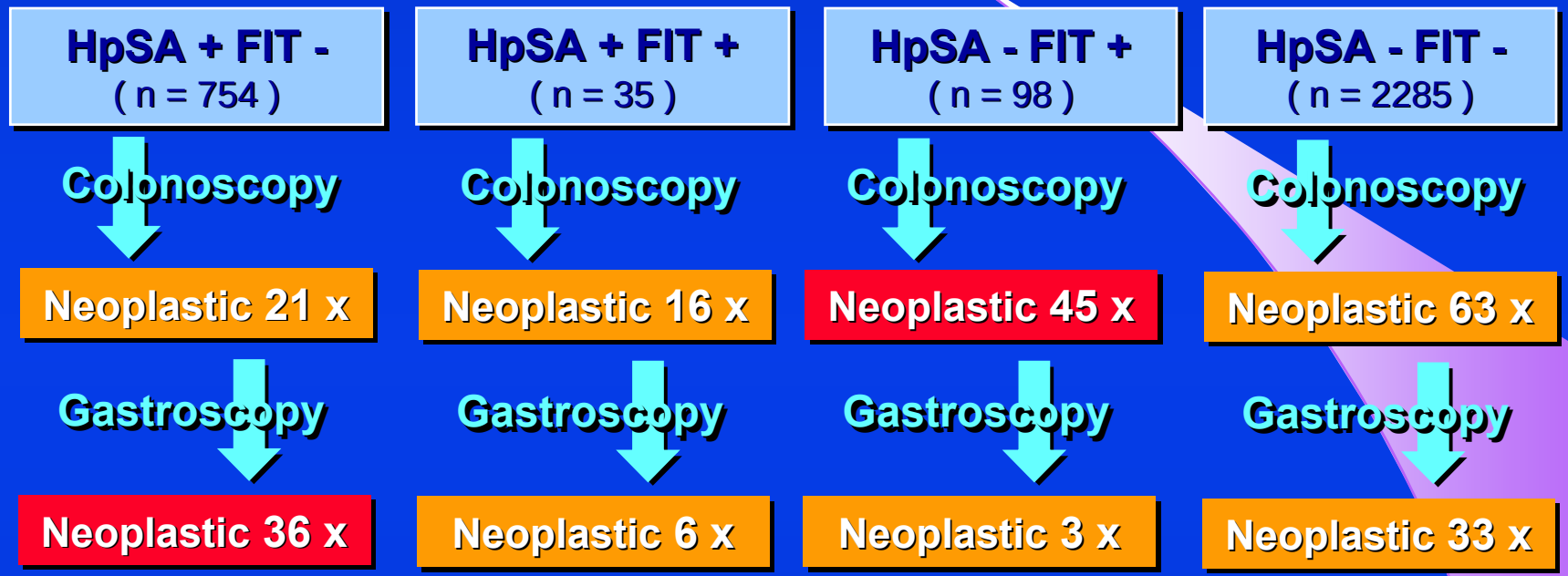
PreGen-Plus is a single test comprised of 23 molecular markers of colorectal cancer. These include:

- 21 point mutations in *APC*, K-*ras*, and *p53*
- One microsatellite instability marker, BAT-26
- One Long DNA marker, DNA Integrity Assay (DIA®)

PreGen-Plus - 23 CRC MOLECULAR MARKERS
21 MUTATIONS - APC, K-ras, p53
MIKROSATELLITE INSTABILITY - BAT-26

Cologuard® - DNA stool test (Exact Sciences)
approved by FDA, September 04, 2014
cena testu je 600 U$, www.medscape.com

CANCER SCREENING - GASTRIC @ COLORECTUM



Lee YC, Chiu HM, Chiang TH, et al. BMJ Open 2013;3:e003989. Accuracy of faecal occult blood test and Helicobacter pylori stool antigen test for detection of upper gastrointestinal lesions.

http://www1.lf1.cuni.cz/~kocna/glab/glency1.htm

http://gelab.zde.cz

Skupina metodik funkce tenkého střeva, malabsorpce, screening céliakie, střevní propustnost, bakteriální přerůstání

- Alfa-1 antitrypsin ve stolici
- Anti-endomysium IgA
- Anti-gliadin IgA, IgG
- Anti-tTG IgA, IgG
- Anti-gliadin, tTG ve stolici
- A-vitamin zátěžový test
- ß-karoten
- ß-karoten zátěžový test
- Céliakie - monitoring
- Céliakie - screening
- Dechový test s laktózou
- Dechový test s xylózou
- Gliadin 33mer
- Laktózový toleranční test
- Laktulózo/mannitolový test
- Vyšetření stolice
- Xylózový toleranční test

Intro

Abecední přehled metodik

HON CODE CERTIFIED 11/2018

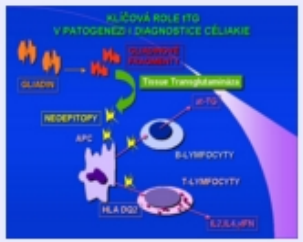
... gastroenterologii

GastroLab

ASOCIACE ZDRAVÍ A Z certifikát NA INTERNETU

Protilátky ke tkáňové transglutamináze (atTG) - IgA a IgG

Tkáňová transglutamináza má přímý vztah k patogenezi onemocnění a byla popsána jako vlastní, chemický substrát endomysia. Tkáňová transglutamináza - (isoenzym transglutaminasa II, TG2 - EC 2.3.2.13, je transferázou, systémový název je protein-glutamin:amin-g-glutamyltransferasa. Je to Ca2+ dependentní enzym, katalyzující deaminaci glutaminu na glutamát, rovněž vede ke vzniku intramolekulární vazby glutaminu na další primární amin, např. lysin a vede k agregaci glutaminových peptidů. Stanovení protilátek ke tkáňové transglutamináze (atTG) má proto rovněž velmi vysokou diagnostickou efektivitu, podobně jako EmA protilátky (senzitivita 87-97% a specificita 88-98%). Stanovení atTG je prováděno klasickou metodou ELISA, což je pro rutinní diagnostiku technika dostupnější než immunofluorescenční průkaz EmA.



Protilátky atTG lze na rozdíl od EmA stanovovat ve třídě IgA i IgG, což má význam pro nemocné se selektivním deficitem IgA. Metoda byla popsána s použitím morčecího antigenu, který je použit ve většině starších souprav, novější soupravy již používají jako antigen tkáňovou transglutaminázu izolovanou z lidských buněk, z lidských erytrocytů, nebo rekombinantní tTG izolovanou na E.coli. Referenční hodnoty se liší u jednotlivých souprav, většinou je pro IgA protilátky uváděna horní hranice normy 10 - 15 IU/l, některé soupravy definují i tzv. gray-zone v rozsahu 10 - 20 IU/l. Stanovení protilátek atTG s lidským, rekombinantním antigenem vykazuje nižší falešnou pozitivitu než metody s morčecím antigenem. Nejnovější studie porovnávají protilátky třídy IgA a IgG, a POCT metodiky stanovení atTG protilátek. Stanovení protilátek atTG ve třídě IgA je doporučeno jako základní screeningový test pro diagnostiku celiakie. Pro screening byla v roce 2011 použita i technologie detekce atTG ve slinách, a nejnovější studie popisují zcela nové technologie detekce protilátek elektrochemickými imunosenzory. Nejvyšší spolehlivost, citlivost i specificita 99-100% je prokázána pro komplex transglutaminázy s deamidovaným gliadinem (neo-tTG).

Reference

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