

Nutritional Intervention in IBD

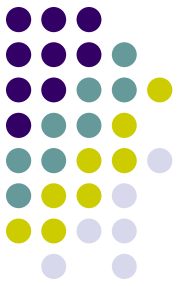
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7th Jan 2011





30 minute overview

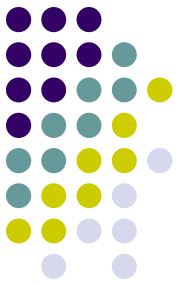
- Malnutrition in IBD
- Roles of nutrition
 - Adjuvant
 - Primary
- Clinical evidence
- Patient selection
 - Case study
- Best practice guidelines
- Conclusion



Learning objectives

1. Consider the causes of malnutrition in IBD
2. Understand the different roles of nutrition
3. Learn the indications for primary therapy
4. Be aware of recent best practice guidelines

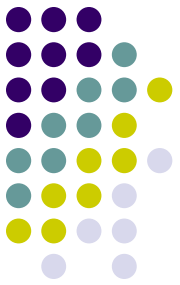




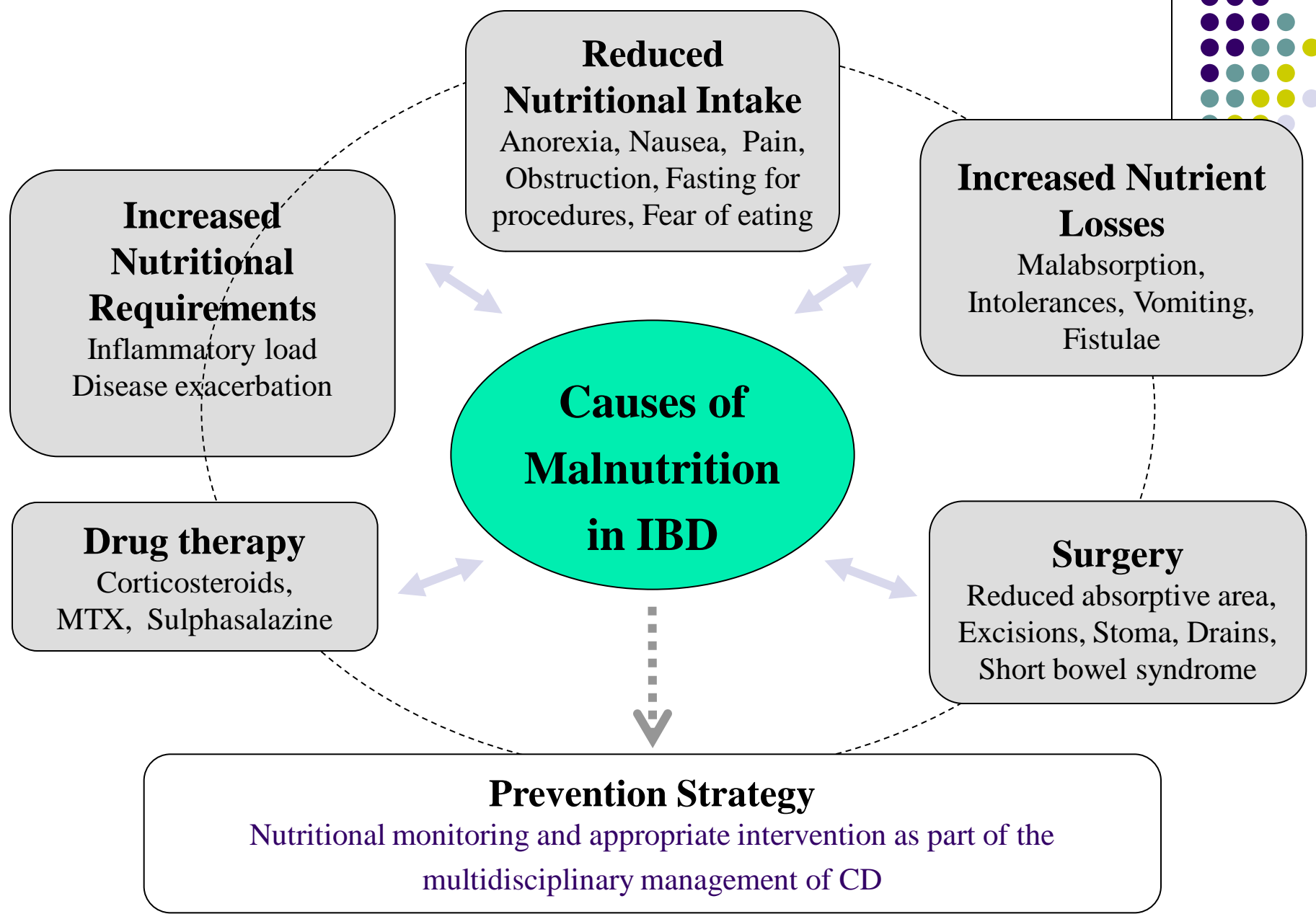
Questions

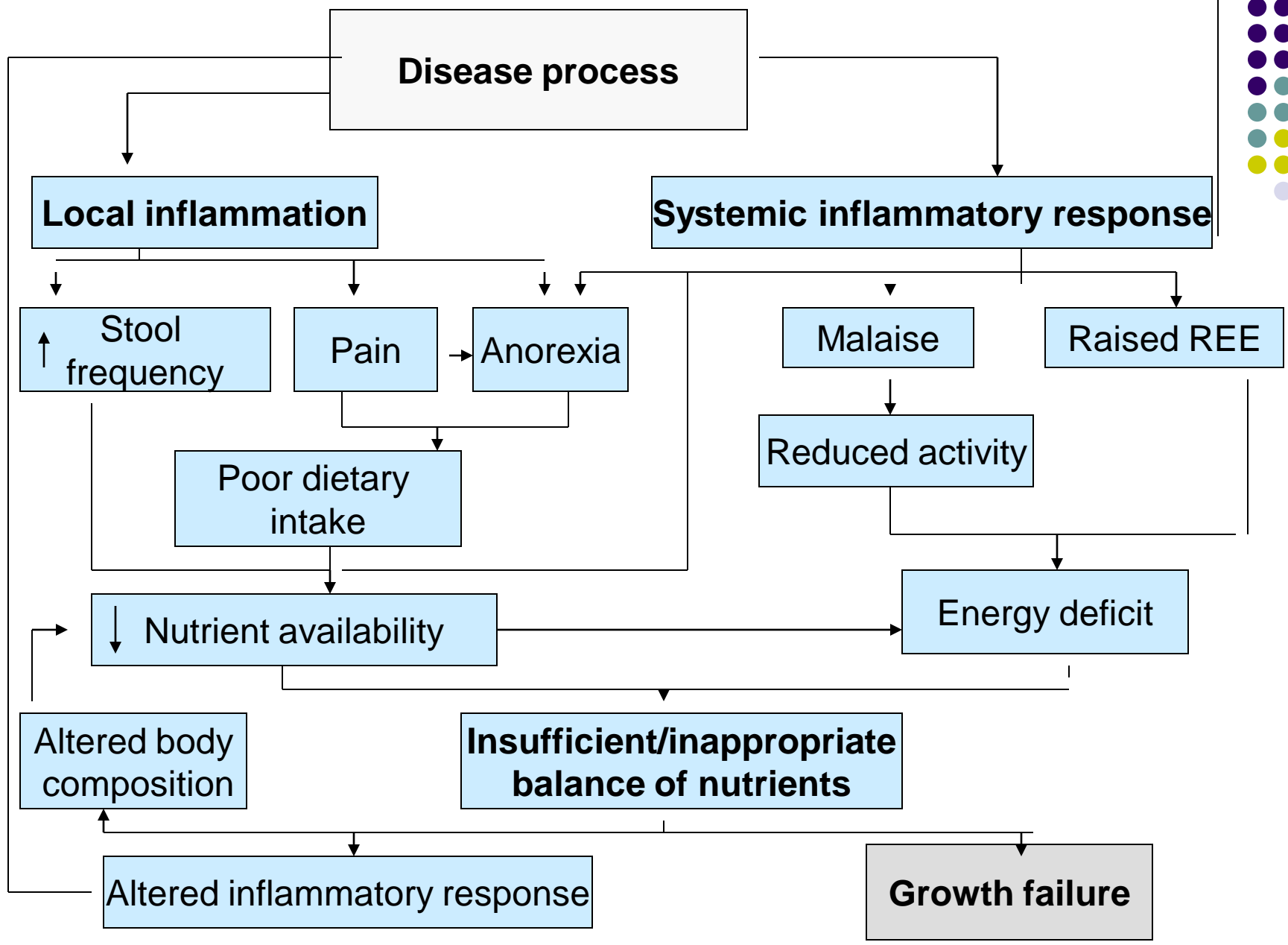
Can you use nutrition to treat active Crohn's Disease?

What are the important nutritional issues in this patient group?

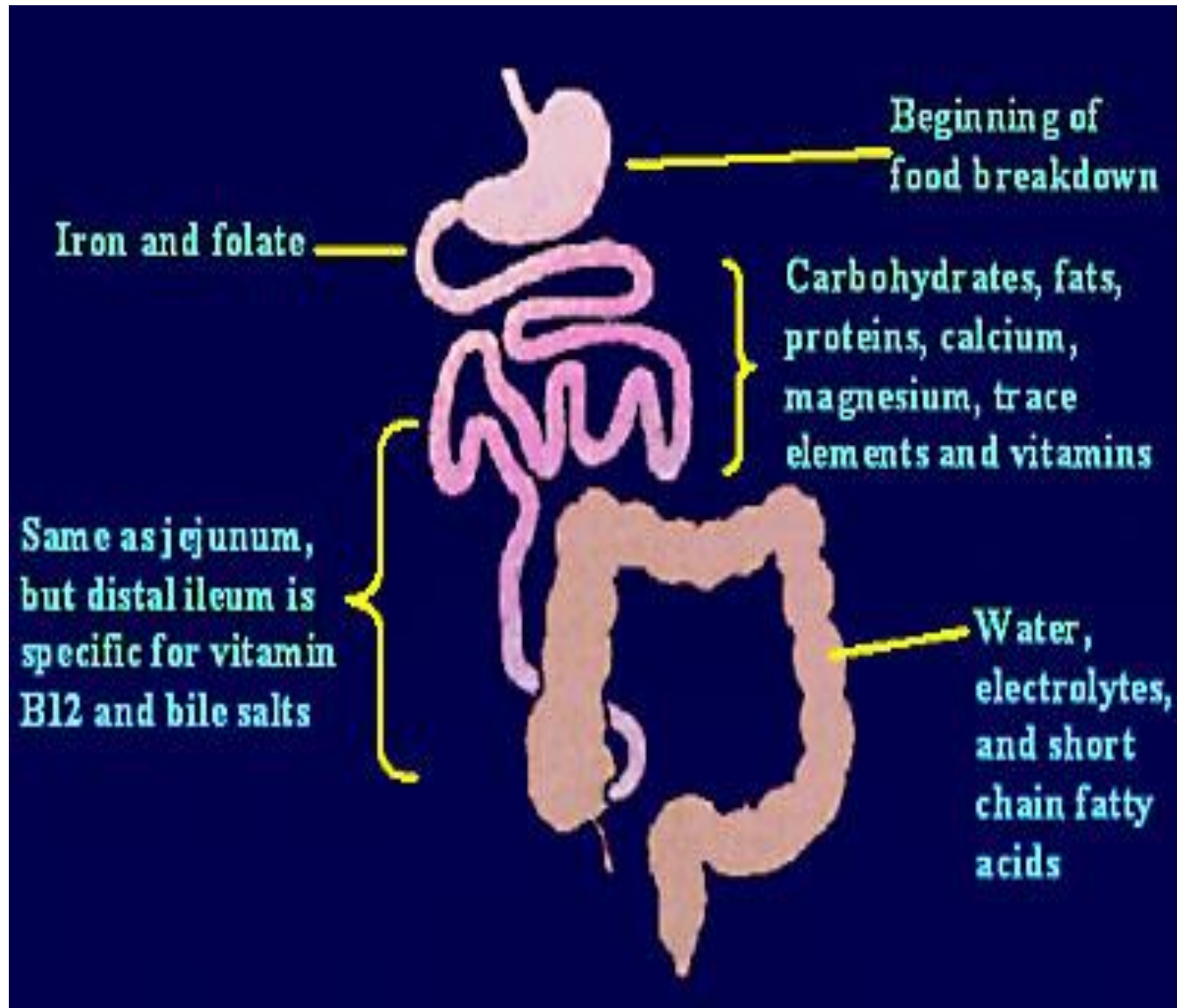
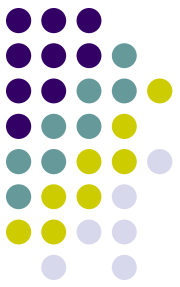


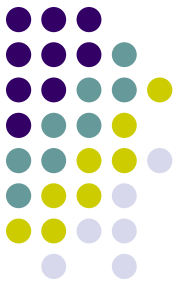
Malnutrition in IBD





Nutrient absorption sites



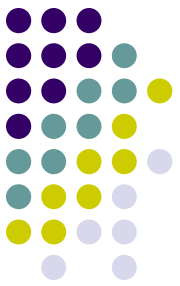


Nutritional status – active phase

- Up to 85% Protein Energy Malnutrition in hospitalised pts¹
- Up to 75% experience weight loss & 50% present in negative nitrogen balance²

¹ Vagianos K *et al* 2007

² Lochs H, 2004



Nutritional status - quiescent

- 40% overweight in quiescent disease³
 - More prone to develop active CD⁴
 - Require surgery sooner⁵
- Lean body mass & muscle function are significantly reduced even in remission⁶
- Body fat distribution differs – depletion of visible fat & increase in intra-abdominal fat → ? role in inflammatory process⁷

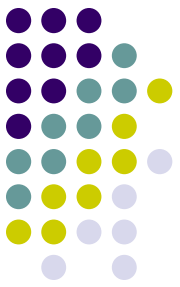
³Nic Suibhne *et al*, 2009

⁴Blain A *et al*, 2002

⁵Hass DJ *et al*, 2006

⁶Jahnsen J *et al*, 2003

⁷Peyrin-Biroulet L *et al*, 2007



Micronutrient deficiencies

Deficiency	Estimated Frequency %
Bone related:	
● Calcium	13
● Magnesium	14-33
● Vitamin D	75
Anaemias:	
● Iron	39
● Folate	54
● Vit B12	48

Source: O' Sullivan MA & O Morain CA, 1998

Associated nutritional complications



➤ **Metabolic bone disease -**

- Osteopenia/Osteoporosis/Osteomalacia

➤ **Lactose intolerance -**

- Transient

Seek and treat

➤ **Steatorrhoea -**

- TI involvement/excision → reduced bile acid absorption → fat & fat sol vit malabsorption (Vit ADEK)

➤ **Micronutrient deficiencies -**

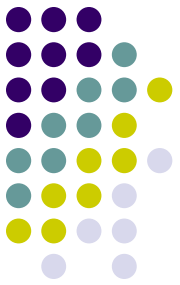
- Magnesium & Zinc if excessive GI losses, Vit A, D & E, Vit B₆

➤ **Anaemia -**

- iron, folate, Vit B₁₂

➤ **Thromboembolic complications -**

- Excess plasma homocysteine in IBD. Pathway dependent on folate, B₁₂ and B₆



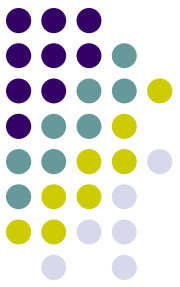
Role of Nutrition in IBD



Diet in IBD

- Dietary intervention depends on:
 - Disease location
 - Phase - active/quiescent
 - Nature - presence of strictures/fistulae
 - Current medical treatment
 - Surgical intervention
 - Individual symptoms

No clear nutrition 'formulation' that works for all patients



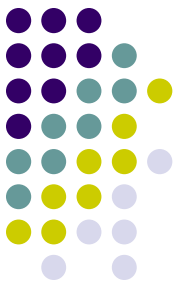
Adjuvant Therapy

Basic nutrition support to prevent or treat malnutrition

- Supplemental NG feeding for weight gain
- Micronutrient replacement if deficiency
- Parenteral nutrition (PN) if small bowel obstruction

For **correction and maintenance** of nutritional status in both Crohns and Ulcerative Colitis

Targeting nutritional status - weight, nutrient deficiencies, functionality



Primary treatment

Using nutrition to achieve remission in patients with an acute exacerbation of Crohn's disease

- Exclusive liquid diet/Total Enteral Nutrition (TEN)
- Polymeric or elemental type formula
- Orally or via nasogastric tube (NGT)
- Min 10 days - Approx 4-6 weeks
- Commence reintroduction diet (e.g. LOFFLEX) when established on medical treatment
 - Draft British Dietetic Association (BDA) GSIG consensus guidelines 2010

Targeting disease activity & inflammation

Formulae



Categories refer to nitrogen source

Polymeric = whole protein

e.g. Osmolite (*Abbott*)
Nutrison (*Nutricia*)
Fresubin (*Fresenius Kabi*)
Modulin IBD (*Nestle*)

Semi-elemental = polypeptides

e.g. Perative (*Abbott*)
Peptisorb (*Nutricia*)
Survimed OPD (*Fresenius Kabi*)

Elemental = amino acids

e.g. E028 (*Nutricia*)

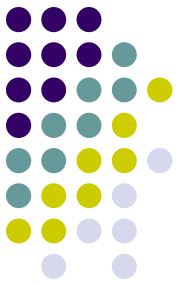


Reintroduction diets

- Elimination diets
 - 1 new food per day, 2-3 times daily
 - Concurrent reduction in sip feed volume
 - Food diary
 - If symptom free, allow food ad libitum
 - If provokes reaction, exclude and retest later
 - 2 days rest after 7 days testing (delayed reactions)
 - Process takes ~ 3months even with daily testing
 - Continue for 2-3 symptom-free years before retesting intolerances
- 'LOFFLEX'
 - 'Low fat, fibre limited, exclusion diet'
 - Based on foods least likely to cause intolerance
 - Start with more foods → more acceptable
 - Process takes ~ 2-4weeks



Not allowed	Allowed
Pork, meat products	All other lean meat & poultry
Fish in batter/crumb/tinned in oil/tomato	All other types of fish/shellfish
Cow/sheep/goat milk, dairy products, eggs, chocolate	Soya milk & products
Wheat, rye, barley, corn, oats, yeast	Rice, tapioca, sago, arrowroot
Corn & vegetable oil	Sunflower & olive oils in moderation
Pulses, onion, tomato, sweetcorn	Potato & all other veg, 2 portions a day, no skins/seeds
Citrus, apple, banana, dried fruit	All other fruit, 2 portions per day, no skins/seeds
Tea, coffee, alcohol, squash, cola	Fruit/herbal teas, water, ribena, non-citrus fruit juice
Gravy mixes, salad dressings, nuts, seeds	Salt, pepper, herbs, spices, sugar, honey, jam



Clinical Evidence

Evidence - inducing remission



- 3 meta-analyses & 1 cochrane review conclude **steroid therapy is more effective than liquid diets at inducing remission** ^{8,9,10,11}

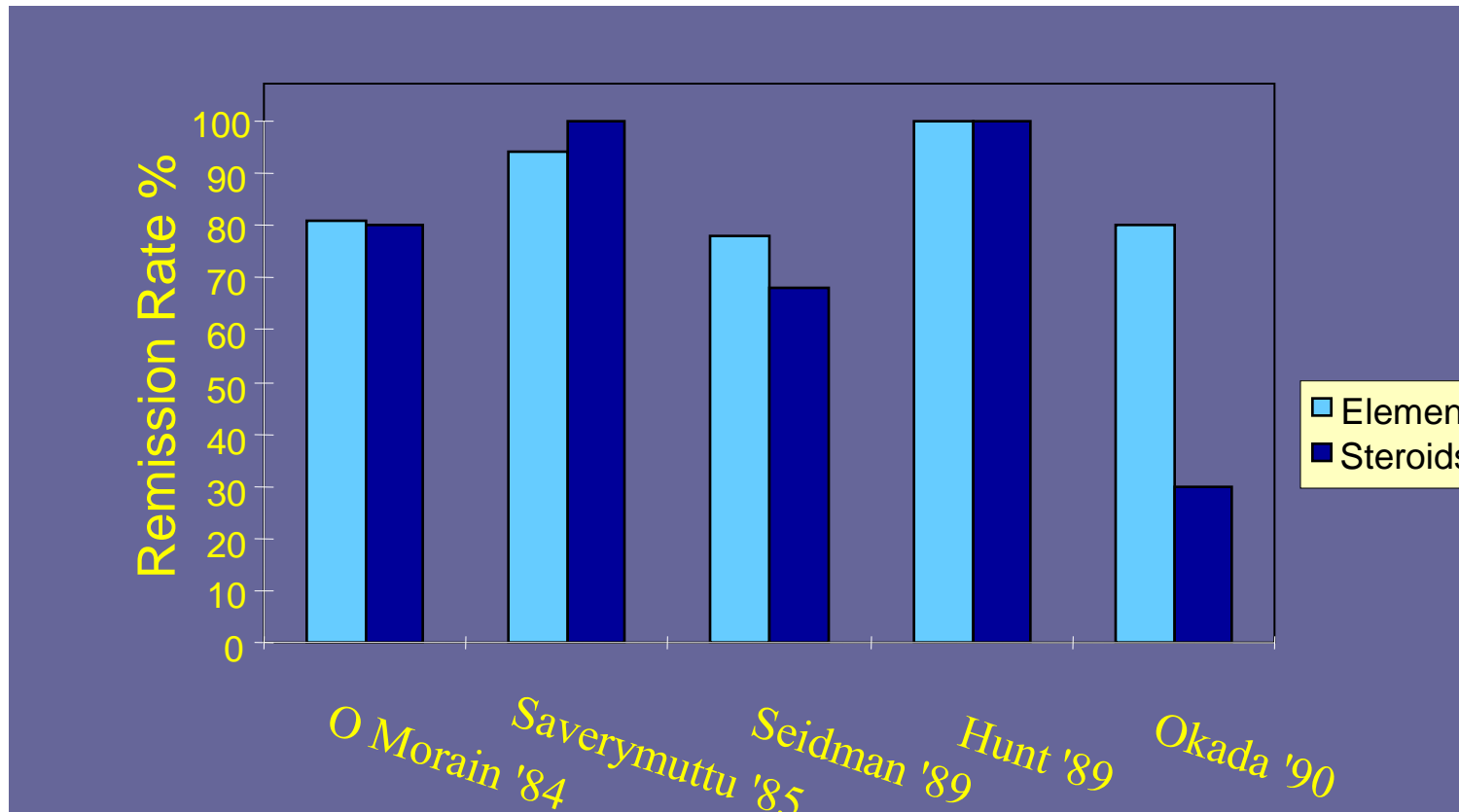
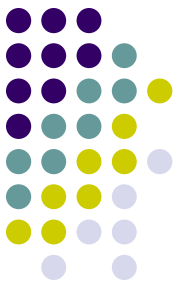
⁸Fernandez-Banares F *et al*, 1994

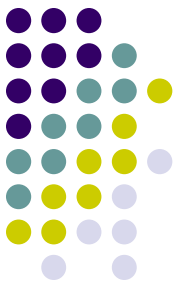
⁹Griffiths AM *et al*, 1995

¹⁰Messori A *et al*, 1996

¹¹Zachos M *et al*, 2007

Primary Therapy : EN v Steroids in CD Clinical Trials





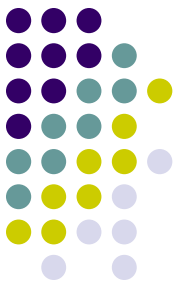
Evidence – inducing remission

- **In Japan – used first line with good success¹²**
- **Overall remission rate with liquid diets ~ 60%** - similar to that found with pharmacological alternatives 5-ASAs/aminosalicylates & substantially higher than placebo response¹³
- **Compliance an issue** – remission rate of 85% with well-supported compliant patients on an elemental diet¹⁴

¹² Matsui T *et al*, 2005

¹³ Gassull MA *et al*, 2001

¹⁴ Teahon K *et al*, 1990

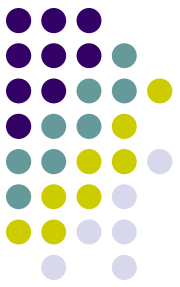


Evidence - inducing remission

- **Trophic effects** of liquid diet on gut mucosa along with down regulation of inflammatory response^{15,16}
 - ? prolongs remission
 - Paediatric population
 - Used formula with a natural **anti-inflammatory growth factor** (TGF B2 - *Modulin IBD, Nestle*)

¹⁵Fell JM *et al*, 2000

¹⁶Borelli O *et al*, 2006



Evidence - maintaining remission

- Few studies on exclusive liquid diet to maintain remission
- All beneficial ^{17,18,19}
- Cochrane review - may be effective but larger studies needed ²⁰

¹⁷Matsui T *et al*, 2005

¹⁸Verma S *et al*, 2000

¹⁹Takagi S *et al*, 2006

²⁰Akobeng AK & Thomas AG, 2007

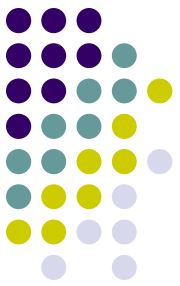
Evidence – concurrent therapy



- Concurrent dietary treatment **can increase medical efficacy**²¹
- **Used as a bridge** to control symptoms before 2nd line medications such as 5-ASAs take effect
 - Supported by BSG guidelines & cochrane review^{11,22}

²¹O' Brien CJ *et al*, 1991

²²Carter MJ *et al*, 2004



Evidence - formulae

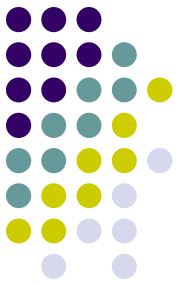
- **Majority of studies comparing elemental, semi-elemental, and polymeric formulae found equal efficacy** ^{8,9,11,18,23}
 - Most studies in adults have used elemental so difficult to draw concise conclusions ^{11,14,24,25}
 - One meta-analysis – trend towards greater efficacy with formulas with lower content of long chain triglycerides ²⁶
 - Further studies required to identify ‘ideal’ formula
 - Polymeric first line in practice – cheaper, more palatable, lower osmolarity

²³Raouf AH *et al*, 1991

²⁴O’ Morain CA *et al* 1984

²⁵Silk DAA, 1992

²⁶Middleton SJ *et al*, 1995



Patient selection



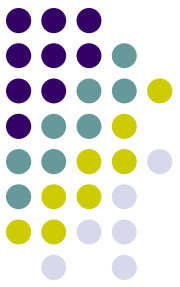
Why nutrition not steroids?

- **Risk-benefit of different treatment strategies**
 - Efficacy
 - As effective as steroids in inducing remission
 - 60-80% remission rate - greater with better case selection
 - Mucosal healing
 - Certain formulas – anti inflammatory growth factor
 - No undesirable side effects
 - Bone health and growth unaffected

Indications for using nutrition as primary treatment



- TEN may not suit all circumstances
- **Careful case selection** for better efficacy
 - Crohn's disease
 - Anatomic location of disease
 - Age or disease duration
 - Gap between medical treatments
 - Patient preference - highly motivated
 - Paediatric population
 - During pregnancy



Patient selection²⁷

● Indications

- Active disease of small or large bowel
- Childhood/adolescent
- Steroid resistant
- Steroid poorly tolerated
- Narrowing due to oedema or swelling of mucosa

● Contraindications

- Quiescent disease
- Disease affecting rectum only
- Patient unable or unwilling to comply
- Bacterial overgrowth
- Presence of fistulae or abscesses
- Presence of tight or multiple strictures

Case Study



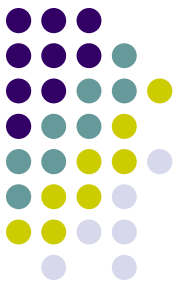
Female, DOB: 16.08.1983 - Small bowel CD diagnosed Apr 2008

Nov 2008 - **C/o Imuran** 150mg OD po + weaning dose prednisolone
63.8kg

May 2009 - Bloating, joint pains, BO x 4/d – formed (baseline).

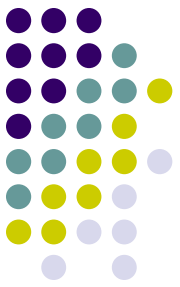
Dec 2009 - Distressed with bloating, nausea, & anorexia.
BO x 4-5/d – formed. **62.9kg**

May 2010 -Increased diarrhoea (4-8/d, no blood/mucus), nausea,
abdo pain, wt loss.
-Reluctant to start steroids – **c/o entocort** 9mg (reducing)
59.3kg



Case study cond..

Jun 2010 -	No improvement with entocort 6mg OD - Diarrhoea x 4/d, Wt loss, abdo pain & bloating Imp: Active Crohn's + ? stricture Work up for humira & SIFT Change entocort → prednisolone	58.4kg
Jul 2010 -	Symptoms improved with prednisolone Humira postponed due to LRTI + antibx	62.5kg
24th Aug 2010 -	Off steroids, symptoms returning (BO x 4-5/d and nocturnal, fatigue). SIFT – NAD. C/o humira (with ongoing imuran 150mg)	63.3kg
15 th Sept 2010 -	Diarrhoea +++ and RIF pain Humira ongoing – no symptomatic response (dose 2) c/o budesonide 9mg/d Dietitian referral for exclusive liquid diet	60.3kg



Case study cond..

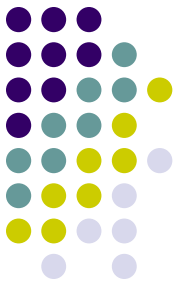
● 17th Sept 2010 – Dietetic assessment

- Reported Wt - **56.9kg**, Ht – 1.68m, BMI = 20.2kg/m² (normal)
- 6.9kg wt loss over 2 years
- Symptoms - BO x 2-3/d formed, abdo cramps, bloating
- Estimated Requirements = 2047kcal, 69-85g protein, 1700-1992mls
 - 10% Stress Factor & Physical Activity Level 1.4 – aim weight maintenance

Treatment plan

- Oral nutrition sipfeeds to reqs – 7 bottles daily (2100kcal, 88g protein, 1400mls)
- Oral fluids (aim ~ 600mls water or weak tea/coffee only)
- Agreed treatment period 2 weeks – 27/09/10 to 11/10/10
- Vit D insufficient (43nmol/l – 4/5/10); other micronutrients normal
 - Note: Alb = 54 (CRP 2.8)
- Supplements - Calcichew D3 forte T BD, Centrum T OD, B₁₂ IM, Omega 3
- Meds - Humira 40mg (~1 month now), imuran 150mg, budesonide 9 mg OD

Daily meal plan



Morning

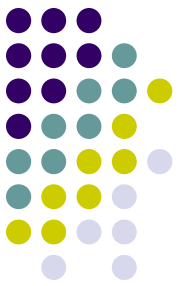


Afternoon



Evening





Case study cond..

4th Oct 2010 – Good compliance (liquid diet, humira + imuran).
Did not take budesonide prescribed in Sept.
Feeling very well – formed BO x 1-2/d, no bloating/pain – & happy to continue.

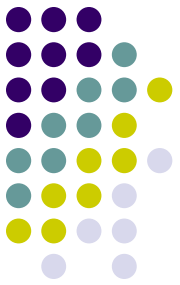
5th Oct 2010 - Humira gradually taking effect (6 wks)

60.5kg

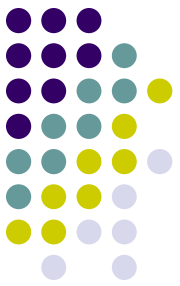
12th Oct 2010 – **Commenced reintroduction diet** now established on medical treatment and weaned off exclusive liquid

10th Nov 2010 - Much improved - formed BO x 1/d
Weaned onto normal diet – no intolerances noted
Sipfeeds ongoing x1/d + humira 40mg (11wks) & imuran

63kg, BMI 22.3kg/m²



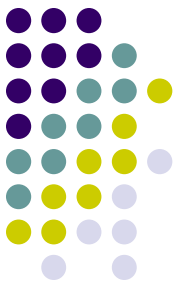
Guidelines



Consensus – exclusive liquid

- **BSG guidelines 2004** ²² (**B**ritish **S**ociety of **G**astroenterology)
 - Liquid diets as primary therapy in active ileal, ileocolonic, or colonic CD & contraindication to or prefer to avoid corticosteroids
 - As adjunctive therapy in ileal, ileocolonic or colonic active fistulating and perianal disease
- **ECCO 2006** ²⁸ (**E**uropean **C**rohn's & **C**olitis **O**rganisation)
 - Liquid diets only to be used as adjunctive to medical therapy except where patients decline other drug therapy. Do not recommend in corticosteroid refractory or dependent disease.

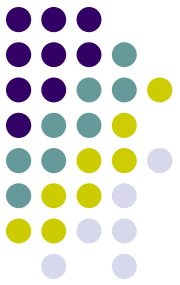
²⁸ Travis SPL *et al*, 2006



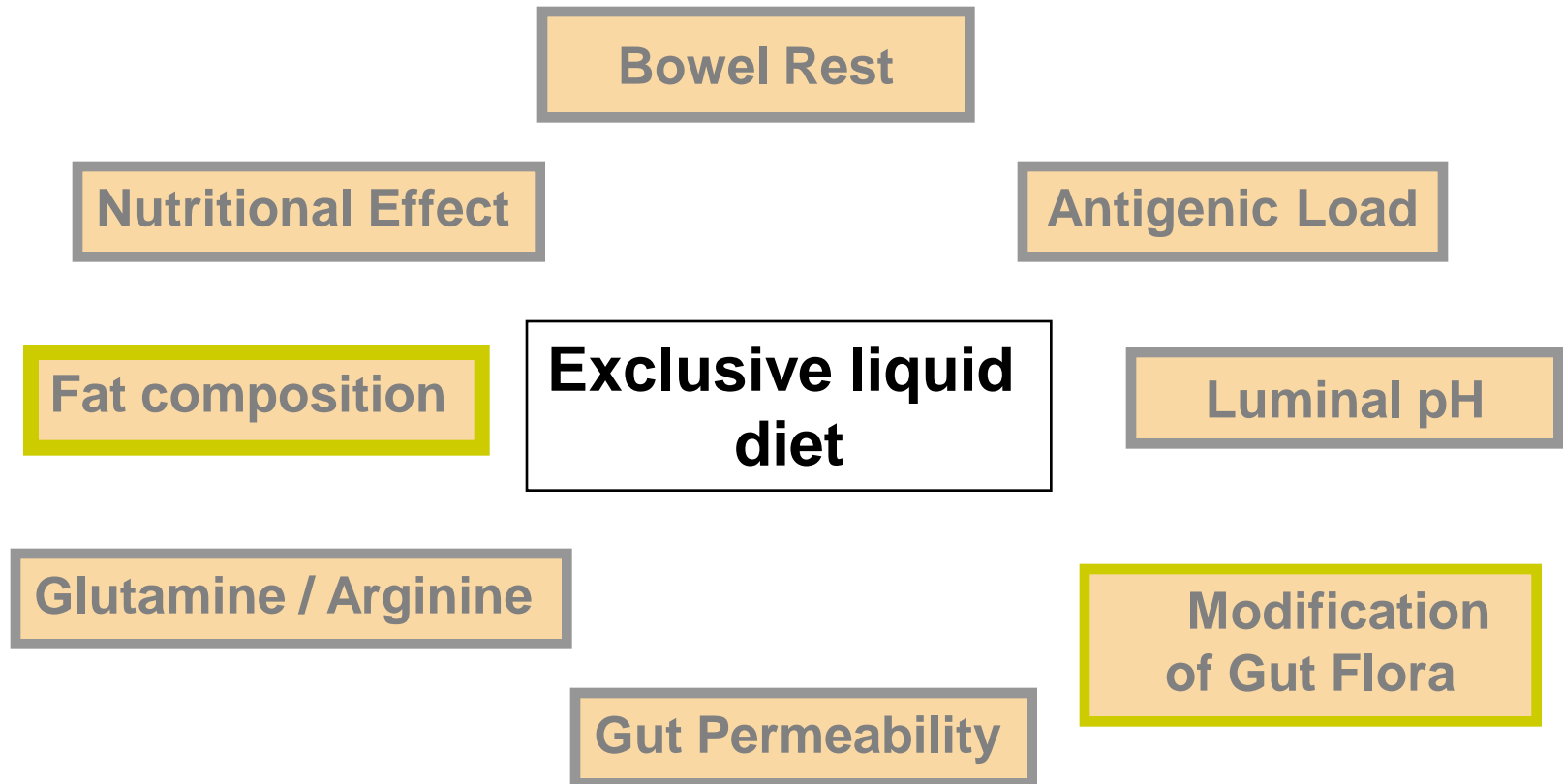
Consensus – exclusive liquid

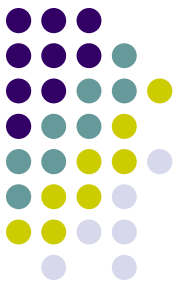
- **ESPEN 2006²⁹ (European Society of Enteral & Parenteral Nutrition)**
 - In paediatrics, nutrition therapy as first line
 - In adults, use enteral nutrition as sole therapy for the acute phase mainly when treatment with corticosteroids is not feasible (Grade A)
 - No significant difference in the effect of free amino acid, peptide-based, and whole protein formulae (Grade A)
 - No clear benefits for omega 3, glutamine, TGF-B enriched formulae (Grade A)

²⁹Lochs *et al*, 2006



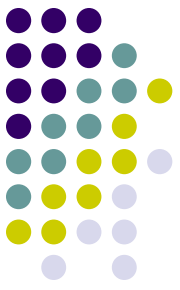
Mechanisms of Action?





Unknowns

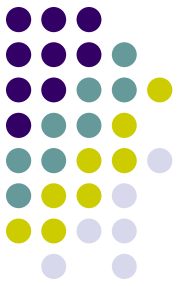
- **Mechanism of action?**
 - Theories
- **Which patients benefit most ?**
 - More subgroup analysis needed
- **Optimal length of treatment ?**
 - Min 10 days
 - Unlikely to respond if still symptomatic in 2nd week ²⁷
- **How best to reintroduce food when in remission**
 - Various reintroduction diets – not evidence based



Parenteral nutrition

- **ESPEN PN guidelines 2009** ³⁰
 - PN should not be used as primary treatment of inflammatory luminal Crohn's Disease. Bowel rest has not been proven to be more efficacious than nutrition per se (Grade A)
 - The most common indication is the presence of short bowel syndrome (Grade B)
 - Indicated for those who are malnourished, have inadequate or unsafe oral intake, or a non functioning, inaccessible or perforated gut. Specific indications – obstruction, high intestinal or fistulae output (Grade B)
 - Supported by BSG guidelines 2004 - 'Enteral nutrition is preferred (Grade C)'

³⁰Van Gossum A *et al*, 2009



Future

- **Nutrigenomics**

- Interplay between genes and diet
- ? more targeted & individualised treatment

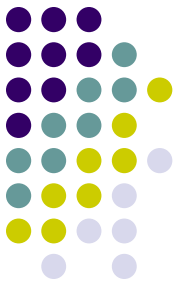
- **Role of specific nutrients**

- Probiotics & prebiotics, omega 3 fatty acids, polyphenols
- Emerging evidence but roles yet to be elucidated



Solutions

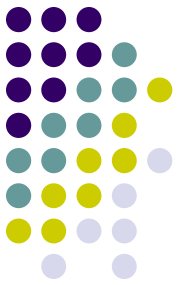
- **Can nutrition be used to treat active IBD?**
 - Yes – Crohn's disease only
 - First line in paediatrics
 - Better efficacy in certain adult cases
- **What are the important nutritional issues?**
 - Identifying risk of malnutrition
 - Consider disease phase & location/surgical history
 - Setting goals of nutritional intervention
 - Adjunct, primary or concurrent?



Conclusions

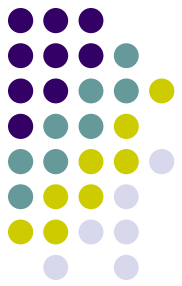
- Nutrition status varies according to disease phase and malnutrition is not always overt
- Nutrition is a viable treatment option for certain subgroups with Crohn's disease
- A combination of diet and medical treatments may enhance outcome
- Require more clinical trials

References



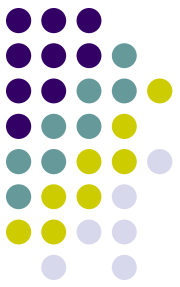
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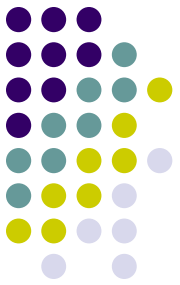
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Thank-you