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Diet as IBD Treatment

DEVELOPED BY THE CROHN'S & COLITIS FOUNDATION'S NURSE & ADVANCED PRACTICE COMMITTEE

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Disclosures

None

Instructions

To begin, please enter “Slide Show mode” to enable full interactivity of case and questions.

When you see words or phrases that are underlined, click on the underlined word and this will take you to the next screen.

To continue the presentation, make sure you click back or next in the bottom right corner.

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Objectives

After completing this activity, the participant will demonstrate the ability to:

- Discuss evidence for use of diet as IBD treatment
- Describe current diets used as treatment in IBD (EEN, CDED, SCD)
- List benefits of nutrition therapy
- Discuss limitations of diet research

Pathogenesis of IBD

Inflammatory bowel disease, which includes Crohn's disease and ulcerative colitis, affects approximately 6.8 million people worldwide (Peppercorn & Chiefetz 2023).

The incidence of IBD is increasing, particularly in developed countries.

Current data suggests that the development of IBD is influenced by:

Genetic predisposition

More than 200 genes associated with IBD have been identified.

Dysregulation of the immune system

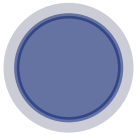
Several immune pathways are involved.

Environmental triggers

Several environmental triggers have been implicated, including:

- diet
- antibiotics
- infectious organisms
- aseptic environments
- medications

Dietary factors are thought to be a significant environmental trigger that drives inflammation. (Levine et al., 2018)



Microbiome

The microbiome is influenced by dietary intake. It plays an important role in the development of IBD.

(Causes of Crohn's Disease | Crohn's & Colitis Foundation (crohnscolitisfoundation.org))

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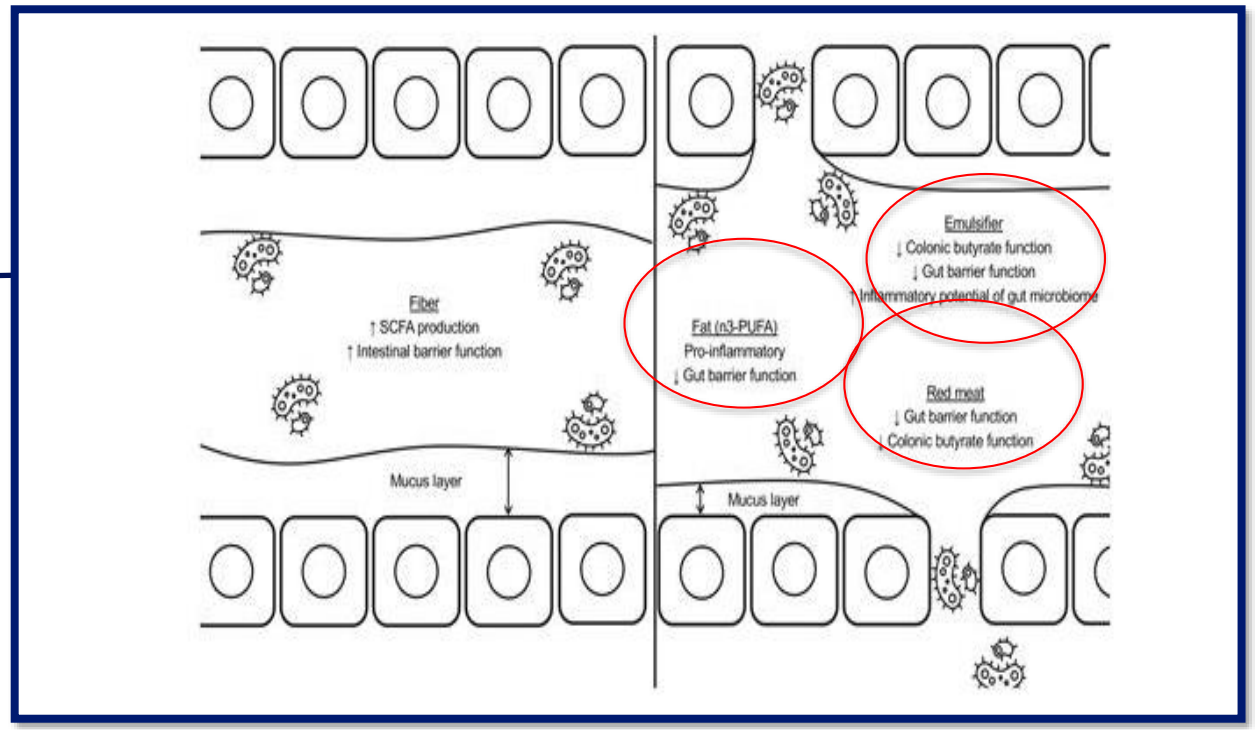
Gut Pathophysiology

Normal barrier function

Disrupted barrier function

The intestinal mucous layer acts as a barrier preventing bacteria from crossing the epithelium.



With disrupted barrier function, bacteria crosses the epithelium causing the immune system to become activated.

Increased permeability and high bacterial penetration of the mucous layer are found in both CD and UC.

Adapted from Gu et al. *Inflammatory Bowel Diseases,* 2020; 26(2): 181–191. doi.org/10.1093/ibd/izz268

Recent data suggests that diet influences the composition and function of the microbiome, which can impact the mucous layer and barrier function of the intestinal lining. This has led to the proposed use of diet in the management of IBD. (Levine et al., 2018)

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General Dietary Recommendations

In 2020, the International Organization for the Study of Inflammatory Bowel Disease (IOIBD) working group provided nutrition guidance for patients with IBD based on review of literature and expert consensus.

General nutrition guidance for patients with:

Crohn's disease:	Ulcerative colitis:
Encourage a diet moderate to high in fruits and vegetables (unless the patient has known fibro-stenotic disease as insoluble fiber should be limited)	Encourage omega-3 oils from food/fish
Decrease intake of foods high is saturated/trans fats, emulsifiers, carrageenan, artificial sweeteners, maltodextrins, and titanium dioxides	Decrease intake of red/processed meats, dairy fat, palm and coconut oil, saturated/trans fats, emulsifiers, carrageenan, artificial sweeteners, maltodextrins, and titanium dioxides

Data is insufficient to recommend a specific diet for all patients.

(Levine et al., 2020; Sigall Boneh et al., 2021)

Diet as Treatment for Crohn's Disease

Numerous published diets claim to be indicated for the treatment of IBD, but few have enough data to support that claim.

Diets that do show efficacy in treatment of IBD include:

- Exclusive Enteral Nutrition (EEN) for mild to moderate Crohn's disease (Ashton et al., 2019)
- Crohn's Disease Exclusion Diet (CDED) for mild to moderate Crohn's disease (Levine et al., 2019)
- Specific Carbohydrate Diet (SCD) – Limited data but can be used in mild to moderate Crohn's disease and ulcerative colitis (Suskind et al., 2020)

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Putting It Into Practice

A Case Presentation

Case Presentation

Susie is a 14-year-old who presented to the outpatient GI clinic with abdominal pain, diarrhea, and weight loss. She had moderate, chronic malnutrition with laboratory evaluation consistent with iron deficiency anemia, vitamin D deficiency, and elevated inflammatory markers.

Her initial diagnostic evaluation included endoscopy and imaging with magnetic resonance enterography (MRE).

- EGD: Chronic, active gastritis and duodenitis.
- Colonoscopy: Focal active colitis in cecum, ascending colon, descending colon and rectum, focal active colitis with chronic changes in the transverse and sigmoid colon. Terminal ileum with active colitis.
- MRE revealed 20 cm of bowel wall thickening in the distal ileum and bowel wall thickening of the colon.

She was diagnosed with moderate inflammatory, non-penetrating, non-stricturing ileocolonic plus upper tract Crohn's disease with no perianal modifier. Based upon presentation at diagnosis, labs, and endoscopic findings, she was classified as having moderate Crohn's disease.

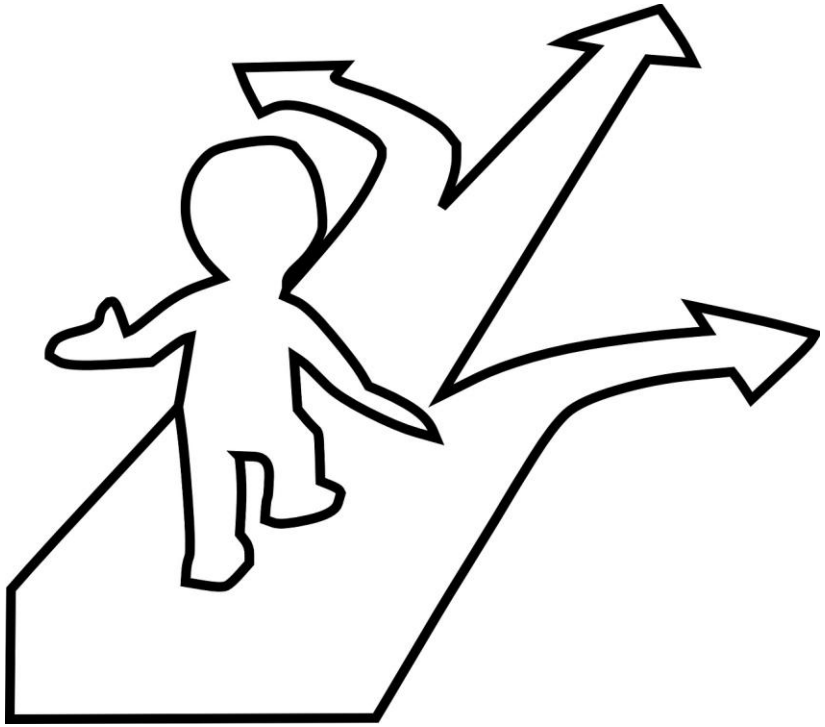
Would Susie be a candidate for diet therapy for primary treatment?

Case Discussion

Several medication options were discussed with the family, but they were very hesitant to start medications because they were afraid of side effects. Family wanted to pursue a non-pharmacologic approach to treatment.

When reviewing dietary options with family, what diet has the most scientific evidence to show efficacy as primary treatment for mild to moderate Crohn's disease?

Exclusive Enteral Nutrition (EEN)
Crohn's Disease Exclusion Diet (CDED)
Specific Carbohydrate Diet (SCD)



Case Study

Exclusive enteral nutrition (EEN) as therapy was reviewed and a plant-based 45 calories per ounce formula (1.5) was agreed upon as the family was vegetarian.

Susie and her parents were concerned she would not be able to adhere to 100% (4 cartons) of calories through formula, so through shared decision-making, they agreed to 90% of total daily calories through formula and 10% of calories from other foods for 6–8 weeks. If she is in clinical remission by week 8, Susie can continue with 90% of calories from formula or could transition to the Crohn's disease exclusion diet (CDED).

They met with a registered dietitian for a nutrition assessment and education for appropriate foods for the 10% portion of the nutrition needs. The dietitian initiated a Certificate of Medical Necessity for the insurance company as Susie's insurance will help cover the cost of the formula as it is a primary treatment.

Opportunities for Nutrition Therapy Use

Patient and parental preference to avoid pharmacotherapy was a key driver for initiation of nutrition therapy as primary therapy in this case study.

What other clinical scenarios would induction of remission with nutrition therapy be appropriate?

Progress of Susie's Enteral Nutrition Journey

Susie attempted oral enteral nutrition therapy but was not able to drink 4 cartons daily and continued to lose weight. She underwent placement of nasogastric (NG) tube to receive her enteral nutrition with a goal of 4 cartons of plant-based 1.5 calorie/oz nutrition drink to provide 90% of her calories. The remaining calories were from other foods.

She and her parents worked closely with the GI dietitian to ensure she consumed healthy calories orally.

The length of therapy for her NG tube enteral nutrition was for 8 weeks. At week 8, Susie was feeling much better, labs were improving, and she was gaining weight. She no longer wanted the NG tube but did not think she could drink the required amount of formula. Susie transitioned to the CDED as she and her parents still preferred diet therapy to medication therapy.

Case Study

Screening laboratory studies showed improvement in iron deficiency and inflammatory markers at week 8.

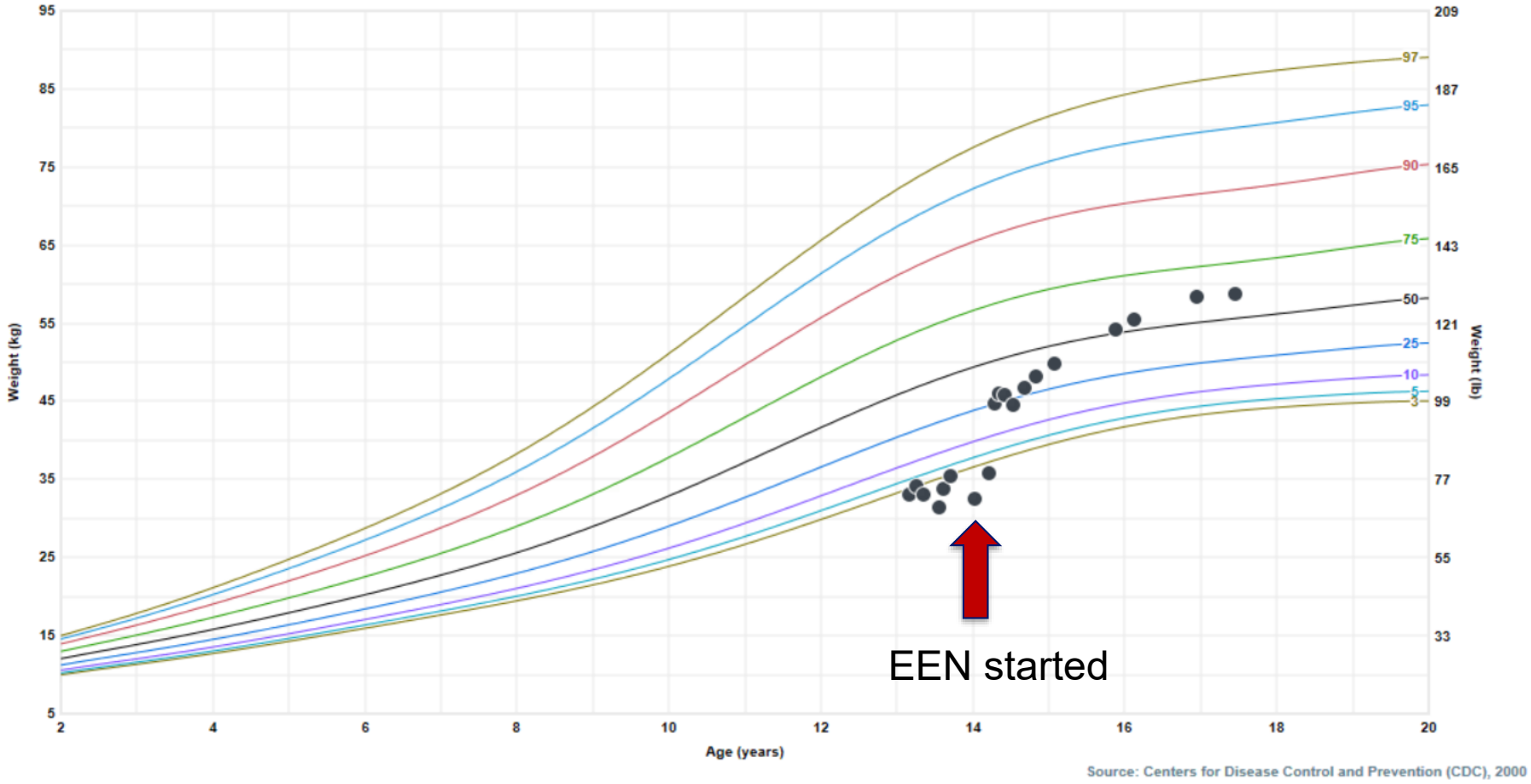
Repeat endoscopic evaluation was done at 9 months to assess for mucosal healing following induction with EEN and maintenance with CDED. Findings are as follows:

- EGD showed no diagnostic abnormalities
- Colonoscopy showed no diagnostic abnormalities

Susie is in histologic remission on CDED. She plans to continue this therapy for now but will notify the medical team if she begins to have a hard time adhering to the diet. At that time, pharmacotherapy will be considered.

Case Study

Growth Curve



Source: Centers for Disease Control and Prevention (CDC), 2000

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Benefits of Nutrition Therapy

- Current IBD medication therapies alter immune function, are expensive, and have side effects.
- Diet therapy acts upon the intestinal microbiome and mucosal integrity with subsequent anti-inflammatory effects. There is minimal cost or side effects.
- Diet therapy can be used as monotherapy or adjunctive therapy.
- Studies have shown a clinical response in >80% of patients in as early as week 3 with both exclusive enteral nutrition (EEN) and the Crohn's disease exclusion diet (CDED).
- Nutrition therapy has NO side effects**!**

(Ashton, 2019; Levine, 2020; Suskind, 2020; Levine, 2019)

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Research Limitations for Diet as Treatment

- Diet research is challenging!
- Most of the current data is extrapolated from animal studies.
- Dietary studies are not randomized, controlled studies.
- Attempting to isolate a single ingredient that causes inflammation is difficult — there are many additives, preservatives and multiple compounds in most foods.
- Data may show certain foods are associated with development of IBD but are unable to demonstrate causality.

(Levine et al., 2020; Sigall Boneh et al., 2017)

Thank you!

We hope you enjoyed this case.

Please complete a brief evaluation to provide us with feedback on this program:
https://www.surveymonkey.com/s/ibdnurse

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Links

Exclusive Enteral Nutrition (EEN)

- Currently, more studies demonstrate the efficacy of EEN to treat Crohn's disease compared to any other diet.
- EEN can be used for induction and maintenance therapy in mild to moderate Crohn's disease.
  - For induction of remission, 100% of caloric intake is through formula for 6–8 weeks to induce remission.
  - For maintenance of remission, this can be decreased to 90% with 10% of calories coming from other foods.
- The type of protein in the formula does not matter; it is the exclusion of other foods that likely decreases inflammation.
- EEN can be used to maintain remission, though this can be challenging due to diet fatigue. Use of a nasogastric (NG) tube may help.
- Studies show 60–86% will achieve remission, with decrease in ESR, CRP, and fecal calprotectin.
- Compared to steroids, EEN is associated with equal or higher remission rates, better growth, and longer steroid-free intervals.
- EEN was not superior to other outcomes, such as time to relapse or complications over a 2-year interval.

(Ashton et al., 2019)

Crohn's Disease Exclusion Diet (CDED)

- Recommended for mild to moderate Crohn's disease.
- Can also be used as a bridge to biological therapy while waiting for screening labs, further medical testing, if there are delays with prior authorizations, and vaccinations.
- Excludes foods that may cause alteration of the intestinal mucosal or translocation of bacteria.
- CDED is low in animal fat, rich in complex carbohydrates, and provides moderate exposure to soluble fiber. It excludes wheat and dairy, emulsifiers, maltodextrins, carrageenan, and sulfites. This should be combined with partial enteral nutrition (PEN).
- There are 3 phases to the CDED: phase 1: 0–6 weeks
  phase 2: 7–12 weeks
  phase 3: maintenance phase starts at 13 weeks
- With whole foods added, CDED + PEN was shown to be more tolerable with similar response and remission rates to EEN.
- 70% of patients on CDED demonstrated a significant drop in ESR and CRP.

(Levine et al., 2019)

Specific Carbohydrate Diet (SCD)

- Indicated as adjunctive therapy for Crohn's disease or ulcerative colitis.
- The mechanism of action is thought to be through the diet's action on the intestinal microbiome as well as improvement in mucosal integrity.
- The SCD eliminates all grains, sugars (except for honey), all milk products (except for hard cheeses and yogurt fermented 24 hours), and most processed foods.
- This is a very restrictive diet so close monitoring is required to avoid the development of restrictive eating disorders.
- The specific carbohydrate diet restricts carbohydrates and processed foods.
- Studies have been done with small sample sizes with conflicting results noted.

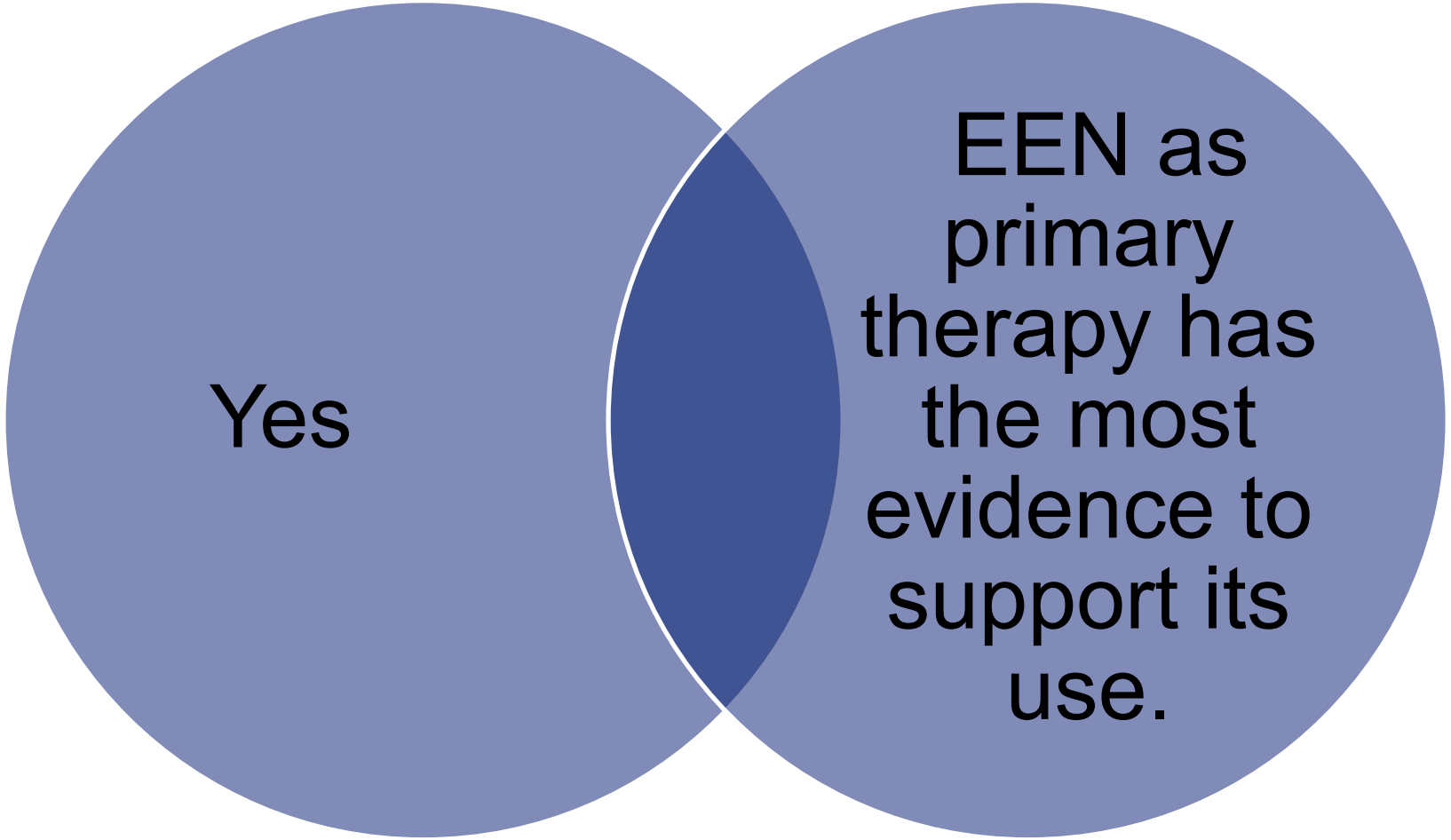
(Suskind et al., 2020)

Would Susie be a candidate for diet therapy for primary treatment?

YES

- She has mild to moderate Crohn's disease.
- She has had mild to moderate malnutrition, anemia, vitamin D deficiency, and weight loss. She could benefit from the calories.
- Compared to steroids, EEN is associated with equal or higher remission rates, better growth, and longer steroid-free intervals.
- Enteral therapy can help her get into remission, correct nutritional deficits, and improve her weight.

Exclusive Enteral Nutrition (EEN)



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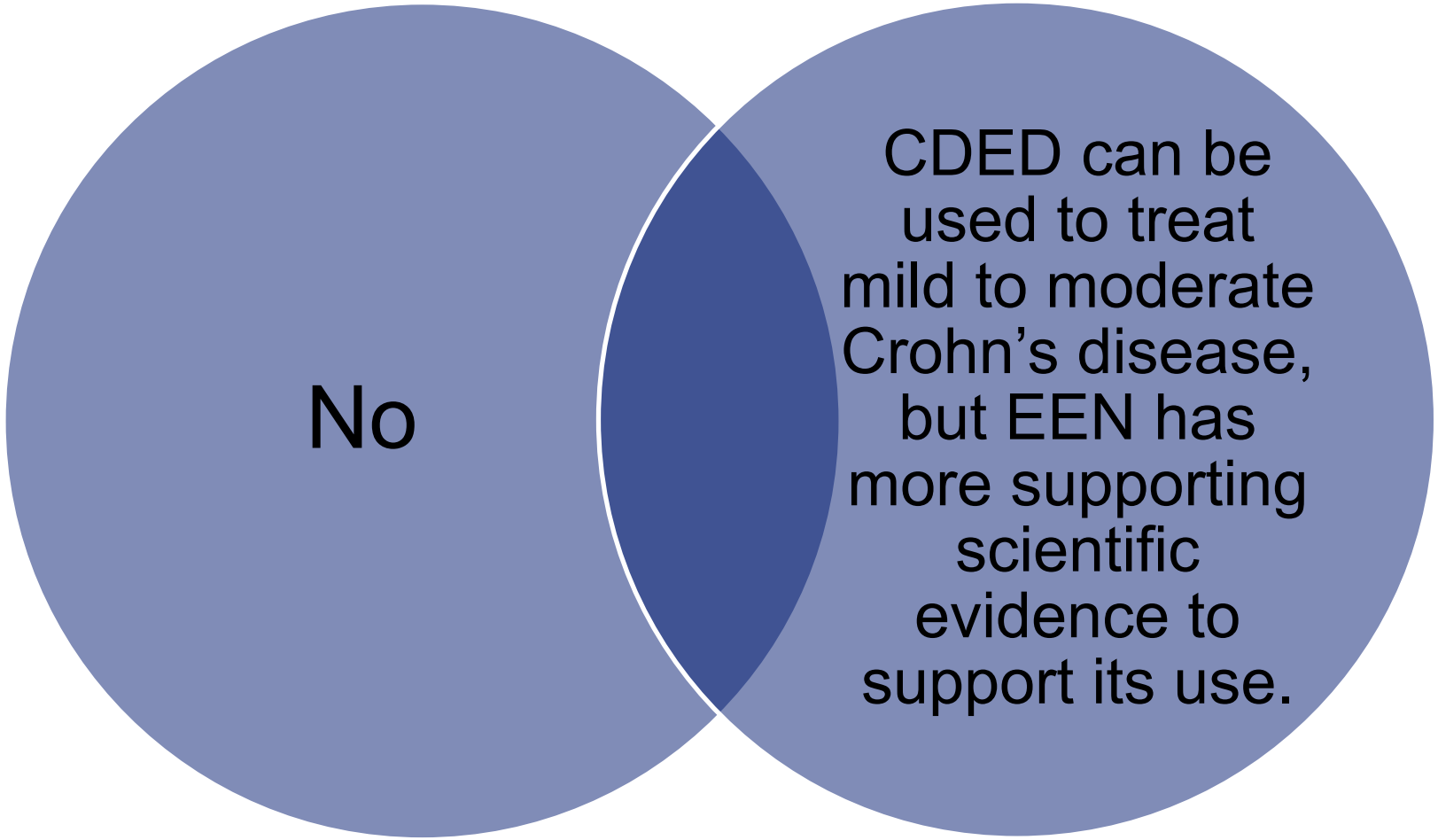
Crohn’s Disease Exclusion Diet (CDED)



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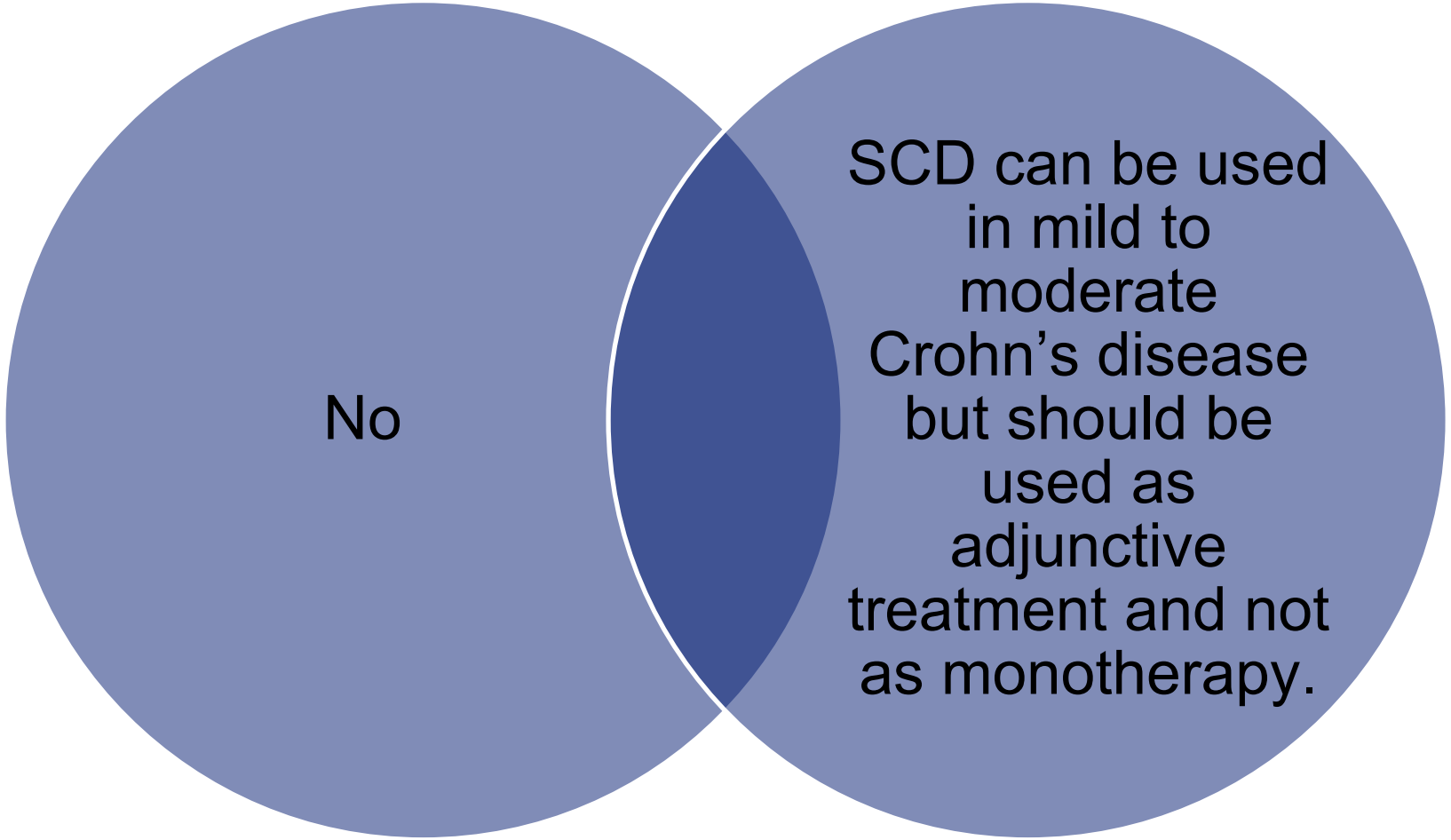
Specific Carbohydrate Diet (SCD)



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Other clinical scenarios for induction of remission with nutrition therapy

Vaccination administration	Live vaccines are contraindicated in patients receiving immunosuppressing medications. If a patient requires a live vaccine, consider starting nutrition therapy to allow for vaccine administration. After 4 weeks, immunosuppressing therapy can be safely started.
Bridge to surgery	An example of this scenario would be a patient that is malnourished and presents with an intraabdominal abscess. The patient may be admitted for IV antibiotics and if there is no contraindication to eating, EEN could be used as treatment until the abscess resolves and/or a surgical resection is complete. Improving the patient's nutrition status prior to surgery can help decrease complications. After surgery, appropriate medication therapy should be initiated. Nutrition therapy could be continued as adjunctive therapy.
Adjunctive therapy	Can be used in addition to medication therapy to improve nutrition status.
Delay in medication prior authorization approval from the insurance company	Nutrition therapy could be started while waiting—positive results can be seen relatively quickly in many patients.