

# Dietary and Lifestyle Interventions for Symptom Improvement in Chronic Inflammatory Conditions

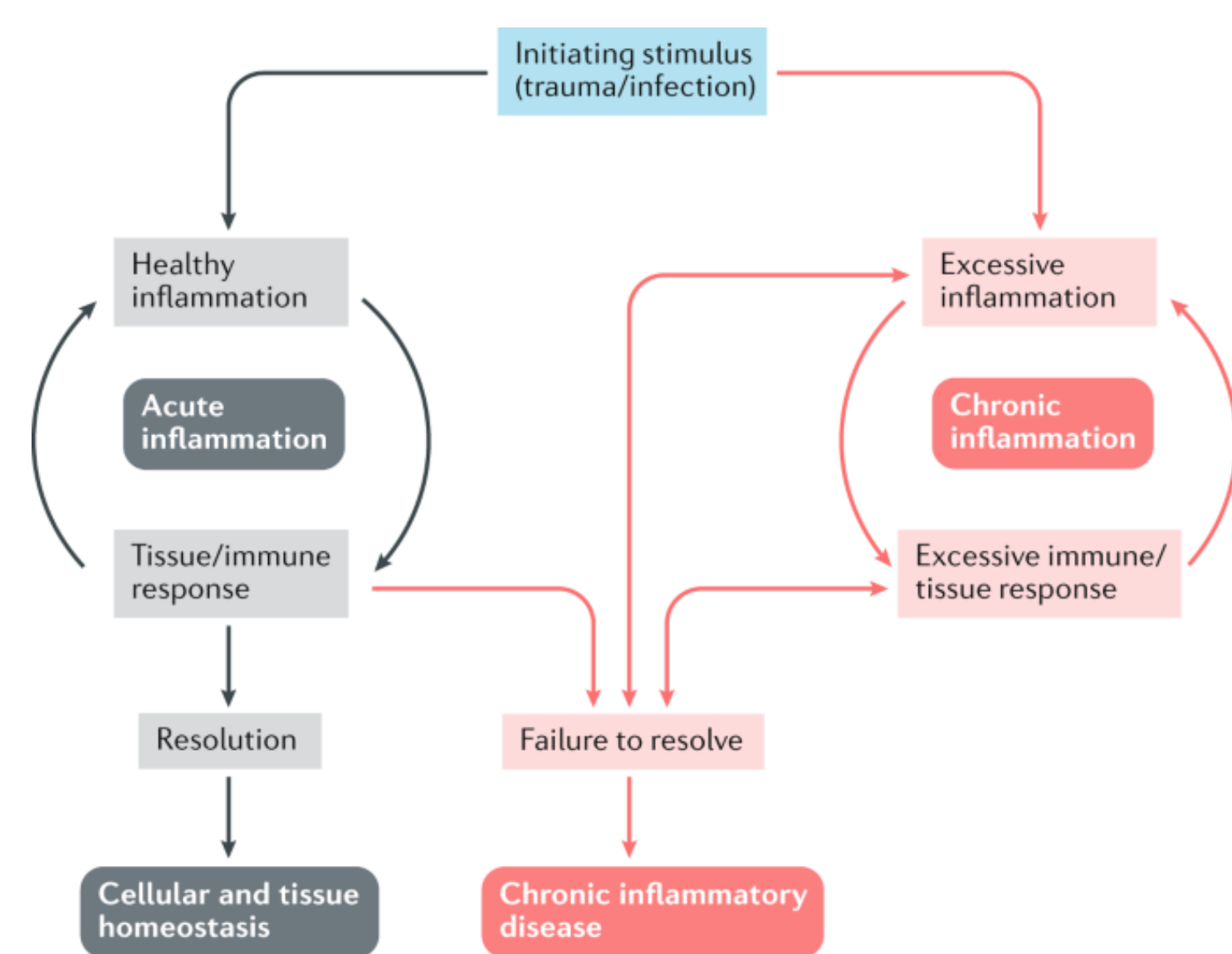
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## Introduction and Purpose

- Inflammation is a broad diagnostic term that is associated with physical symptoms in every major body system. It is the culprit responsible for the development of multiple chronic medical conditions, including cardiovascular disease, diabetes, cancer, autoimmune diseases, chronic hepatic and renal disease, and inflammatory bowel conditions (Center for Disease Control, 2019).
- The purpose of this project was to create an assessment tool for use in primary care to determine signs and symptoms of inflammation in patients, as well as provide those patients with individualized diet and lifestyle recommendations based on their results.

## Significance and Background

- The Center for Disease Control estimates that 60% of adults in the U.S. have at least one chronic disease diagnosis, and that 40% have more than two (2019).
- Common signs of an inflammatory response are persistent body pains, chronic fatigue, insomnia, feelings of depression and anxiety, gastrointestinal complaints, difficulty maintaining weight, and frequent infections.
- Inflammation triggers a cascade throughout the whole body that is activated and managed by many different feedback loops. While acute inflammation is meant to be an adaptive response to an insult, chronic inflammation can be destructive (Bennett, Reeves, Billman, & Sturmberg, 2018).
- The ultimate outcome of any inflammatory response is reliant on the balance between pro and anti-inflammatory influences, which are each mediated by different cytokine and hormonal factors (Slavich, 2015).



<https://www.nature.com/articles/s41584-020-0455-8>

## Background Continued

- The sympathetic nervous system, parasympathetic nervous system, and hypothalamic-pituitary-adrenal axis are the main components of the body's response to chronic inflammation (Slavich, 2015).
- Some of the most effective ways to prevent chronic inflammation are: to increase uptake of anti-inflammatory foods and avoiding known inflammatory triggers, minimize the use of antibiotics and NSAIDs, Exercise regularly and maintain an optimum weight, stress less, and sleep longer (Furman, et al., 2019).
- Previous research has shown that lifestyle interventions initiated in the primary care setting have lead to positive patient outcomes (Morrison, Shubina & Turchin, 2012).
- Obstacles for management of inflammation in primary care have been identified as time constraints (Duff-Brown, 2018), and lack of formal nutrition education for physicians and advanced practice nurses (Kolasa & Rickett, 2010).

## Review of Literature

- The findings in current literature related to this topic established a strong link between chronic diseases and inflammation. The constant presence of inflammation, regardless of the source, eventually leads to dysregulation of reparative and regulatory pathways (Slavich, 2015).
- Nutrition can either instigate or mitigate inflammatory processes. Ingestion of high fat and high carbohydrate meals combines with low intake of fibers, fruits, and vegetables are associated with inflammatory stress (Serafini & Peluso, 2017).
- Physical activity, especially low to moderate intensity, assists in lowering pro-inflammatory cytokines (Paolucci, Loukov, Bowdish & Heisz, 2018). Yoga was found to be especially beneficial (Rajbhoj, Shete, Verma & Singh, 2015).

## Theoretical Framework

- The Health Promotion Model by Nola Pender provided the theoretical framework for this project, as it is focused on improving a patient's level of well-being (Heydari & Khorashadizadeh, 2014).
- This project was intended to create a tool for assessing patients, and provide them with tools to enhance their own health and well-being

## Methods and Project Description

- A Symptom Assessment (SAS) tool and scoring method were created based on the physical and psychological manifestations of chronic inflammation.
- Diet and lifestyle intervention packets were created to address inflammatory symptoms based on SAS scores
- Two patient pilot group was identified based on positive scoring of the SAS
- Patients were provided with Anti-Inflammatory Diet Guidelines, and additional Gut Health Packet as well as Wind Down Packet
- Patients participated in a four week pilot trial of the interventions, with daily personal check-ins, a two-week phone check-in with the researcher, and a final phone check-in.

### Symptom Assessment Survey

Please take a few moments to think about how your body is reacting to your current lifestyle and stressors. By honestly assessing how you feel, your healthcare provider can create a natural symptom relief program for your individual needs.

**Directions:**  
Please read each statement and circle the number 0, 1, 2, or 3 that best describes your feelings or reactions throughout the course of the day. Some questions may seem repetitive, but there is a reason for each question. Don't spend much time on any one question.  
0= never true 1= seldom true 2= sometimes true 3= almost always true

1) Get wound up when I get tired and have trouble calming down	0 1 2 3
2) Feel driven, appear energetic but feel "burned out" and exhausted	0 1 2 3
3) Feel restless, agitated, anxious, and uneasy	0 1 2 3
4) Feel easily overwhelmed by emotion	0 1 2 3
5) Experience heart palpitations or a pounding in my chest	0 1 2 3
6) Stay awake replaying the events of the day or planning for tomorrow	0 1 2 3
7) Feel impulsive, pent up, and ready to explode	0 1 2 3
8) Sleep Less than 7 hours/night	0 1 2 3
9) Have trouble falling asleep and staying asleep	0 1 2 3
10) Wake up tired and unrefreshed	0 1 2 3
11) Experience bloating	0 1 2 3
12) Am constipated	0 1 2 3
13) Have diarrhea or have more than 3 BM's/day	0 1 2 3
14) Forget to eat and feel little hunger	0 1 2 3
15) Eat constantly whether I am hungry or not	0 1 2 3
16) Have trouble losing weight	0 1 2 3
17) Feel puffy and retain fluids	0 1 2 3
18) Have multiple points on my body that when touched are tender or painful	0 1 2 3
19) Use anti-inflammatory pain medication multiple times Per week	0 1 2 3
20) Have frequent headaches	0 1 2 3
21) Experience Eczema or inflammatory acne	0 1 2 3

## Results and Evaluation

- The project was evaluated based on the responses provided on the final check-in.
- Due to the small sized pilot group, each answer was able to be considered.
- Both participants found the provided information packets to be beneficial, and reported some symptom improvement.

	Patient A (SAS score 34, received both GH and WDP)	Patient B (SAS score 45, received both GH and WDP)
1) How did you do with complying with the plan?	OK	Pretty good
1) What percentage of the time do you feel that you followed the diet?	70	85
1) What have been the biggest challenges with maintaining your plan?	Eating out, getting off my phone at night	My kids don't want to eat the healthy food
1) How did the last 2 weeks go compared to the first 2 weeks?	Better	Better
1) How are your symptoms compared to the beginning of your plan?	Maybe slightly better	My bowels are moving a lot better. I feel more awake in the mornings.
1) Is your mental health more positive than before starting this project?	Yes, I like the positivity check-in on the daily questions.	I do feel more focused. The breathing helps too.
1) Is your digestion more regular since beginning this project?	At first no, but now yes	Definitely
1) Are you sleeping more, or is the quality improved?	I fall asleep faster	No, but it's hard with the kids.
1) Have you noticed any changes in your wellbeing that you did not expect?	I think my skin looks way better!	I felt more justified making time to do some of the things for myself.
1) Do you feel like this plan is something you could consider longer?	Probably parts of it, but I probably won't do it all the time.	Some pieces, yes.
1) Do you feel like this information was beneficial to you?	Yes	Yes, I never had real instructions before.
1) What aspects of your plan do you feel were the most beneficial?	The sleep stuff and the water. And I liked the oatmeal a lot.	The grocery list and the meals. Wish there were more of them!
1) Have you, or would you share this information with your family/friends?	I already gave it to my friend who has bad skin problems	Yes I would

## Challenges and Limitations

- Time constraints could be an organizational barrier
- The small pilot group size did allow more individual feedback, but is not a large enough sample for statistical analysis. Results were also based on participant's free responses, and did not use a standardized measurement.
- The SAS was newly developed for this project, and is not a standardized, tested tool.
- This project was only four weeks long, which may not be sufficient to fully benefit from the provided interventions.
- Since results from this pilot were positive, further research would be warranted to advance data on this topic.

## Implications for Advanced Practice Nursing

- The APRN would be the one recommending and monitoring an anti-inflammatory protocol
- Additional professional/continuing education may be necessary in the future
- The provider should consider anti-inflammatory recommendations in relation to other medical diagnosis like diabetes and the use of blood thinners.

## Conclusions

- Patient outcomes could be improved through development of an anti-inflammatory guideline
- The results of this project showed positive results and patient feedback in a small group pilot study
- Further research and evaluation would be necessary for general use in primary care.