

PHYSIOTHERAPY IN THE QUALITY OF LIFE OF PATIENTS WITH PARKINSON'S DISEASE: CLINICAL LITERATURE REVIEW

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Abstract—One of the greatest symptoms of patients diagnosed with Parkinson's are: difficulty in controlling a center of body mass when getting up from a chair, hesitation, difficulty in gait, limitation of axial mobility (especially in bed) and impediment in performing complex movements, such as doing two tasks at the same time. Due to the studies done, several physiotherapeutic techniques for Parkinson's disease were explicit, which was previously hardly used as a therapy for diagnosed patients. Currently, treatment is used jointly with medication, always aiming at the functional independence of Parkinsonians. Physiotherapeutic treatment is often offered to those with Parkinson's as part of a multidisciplinary approach to treatment and aims to improve the quality of life of those living with the disease. Therefore, more scientific evidence is needed regarding the application of the technique with the symptomatology.

INDEX TERMS—physiotherapy, Parkinson's, treatment, quality of life

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1 INTRODUCTION

Parkinson's disease (PD) is one of the most common de- generative diseases of the central nervous system, which presents as characteristic the involvement of neurons in the compact area of the black substance and decreased dopamine, causing changes in tone, involuntary movements, and abnormal postures. It mainly affects people over 60. However, the disease also affects young people. About 10% of patients with the disease are under 50 years of age and 2% under 40 years of age. This is an important census, thinking of equal treatment for all, without distinction of

age [1, 2].

According to the official website of the Hospital Israelita Albert Einstein (www.einstein.br/doencas-sintomas/parkinson), dopamine helps in performing the body's voluntary movements automatically, that is, we do not need to think about every movement that our muscles perform, thanks to the presence of this substance in our brains. In the absence of it, particularly in a small brain region called the black substance, the motor control of the individual is lost, causing characteristic signs and symptoms [3].

One of the greatest symptoms of patients diagnosed with Parkinson's is difficulty in controlling a center of body mass when getting up from a chair, hesitation, difficulty in gait, limitation of axial mobility (especially in bed) and impediment in performing complex movements, such as doing two tasks at the same time. Parkinson's disease makes it impossible for the person to perform daily movements, so physiotherapy is recommended for the physical-functional treatment of the disease [4].

Due to the flexor pattern (interiorized head and shoulders) muscle contraction is intense and frequent, begins a biochemical reaction that releases toxins promotes reduction of local blood supply, which as a consequence patients may report pain in the region or develop secondary problems such as difficulty swallowing, sialorrhoea, excessive visual limitation, in addition to scoliosis. [5] [6]

1.1 PHYSIOTHERAPEUTIC TREATMENT

In principle, the diagnosis of the disease is clinical, based on medical history and physical examination, later the patient is referred to physiotherapy for physical-functional diagnosis. Physiotherapeutic treatment aims to minimize motor problems, contributing to the maintenance of independence to perform activities of daily living (ADL's) and improvement of the quality of life (QL) of these patients [7].

Physiotherapy is indicated as a complementary method of pharmacological intervention in Parkinson's disease because although symptoms such as stiffness and tremor respond positively to medication, there is still a deterioration of the function reflected by changes balance, posture and gait, which condition the activities of the daily life of patients, and physiotherapy treatments can improve functional capacity, minimizing motor problems, contributing to the maintenance of independence to carry out the daily living activities of these patients [8].

Physiotherapeutic treatment consists of training of the most difficult activities to perform by each person, the maintenance or improvement of muscle conditions is also worked, through stretching exercises and global strengthenings, in addition to postural and balance exercises, all associated with respiratory movements, offering the patient ideal conditions or close to it, so that he can perform activities more easily. Muscle-strengthening through the use of resistance exercises to improve muscle strength and cardiorespiratory fitness, besides having beneficial effects on balance, gait performance, and quality of life of these patients [9].

High axial tone (stretch resistance, speed-dependent) in Parkinson's patients contributes to their characteristic movements of the block trunk, which makes it difficult to perform activities such as rolling in bed or turning the

body while walking. Physiotherapeutic treatment despite not reversing or curing the disease can favor independence for daily activities, improvement in harmonica, decreased risk of falls and thus improving the patient's quality of life [10].

1.2 HYDROTHERAPY

One of the treatments indicated in the treatment of Parkinson's patients is aquatic physiotherapy, being a resource that helps in reducing the progression of the disease, acting effectively in preserving mobility, improving muscle activity, reducing muscle activity, reducing muscle activity and offering better quality of life to these patients [11].

The objectives of hydrotherapy in Parkinson's is to improve and/or recover the functions of neuromusculoskeletal and cardiorespiratory systems through water-oriented exercises with differentiated methods, allowing the greater quality of life. Motor problems are aggravated mainly due to immobility, and hydrotherapy is important in re-education and maintenance of physical activity in the treatment of PD, to minimize motor changes caused by the symptoms of the disease, helping patients maintain independence to perform day-to-day activities and improve quality of life [12].

Hydrotherapy treatment for patients with Parkinson's disease adapts to the liquid

medium, trains its balance, mobilizes trunk, trains gait, dissociates the scapular and pelvic waists, trains muscle coordination, exercises with or without resistance, stretching of the anterior and posterior chains [13].

1.3 PILATES

Among the therapeutic methods, pilates has shown benefits for the treatment of Parkinson's disease. It consists of a system of physical exercises that integrate body and mind, providing postural control, strength, flexibility, muscle balance, awareness and perception of movement [14].

With the progression of the disease, axial and postural adjustments become diminished, motor coordination is compromised, causing Parkinsonian to reduce its functional activities, triggering deterioration in physical condition, characterized by poverty decreased in their amplitude, loss of strength, muscle endurance and balance, thus reducing functional capacity [15]. Treatment with Pilates method helps in facilitating daily activities for Parkinson's patients, such as walking or getting out of bed, in a movement session that give rise to the intended gesture and favor the work of stabilizing muscles, promoting the elimination of excessive tension in certain muscle groups, thus avoiding the resulting compensation to imbalances [16].

Stretching exercises involving isotonic

(concentric and eccentric) and isometric contractions used in the Pilates method are done broadly and slowly, emphasizing the quality of movement, working the musculature in a way chronic, and is therefore ideal to assist in the recovery and reorganization of parkinsonian movements [17].

1.4 PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION (PNF)/ KABAT

Proprioceptive Neuromuscular Facilitation Method (PNF) is an approach to therapeutic exercise that uses specific patterns of movements in diagonals and spiral, as well as afferent stimuli to promote a triggering of neuromuscular potential, getting better answers in every skeletal muscle system [18].

NPF techniques have been used to treat Parkinson's disease in an attempt to decrease stiffness by influencing the engine spindle system and encouraging antagonist muscle activities and to improve akinesia by initiating and facilitating movement. It is a rhythmic initiation technique, starting with passive movements and progressing to active and resisted early in the disease is fundamental for a postural adequacy and awareness of an extensor pattern of the upper trunk, and a means of improving the limb mobility is a way of not letting further progress on a decline of this posture that according to pathological evolution tends to develop a previous body

chain flexor pattern [19].

The principles of the Kabat method help improve stretching, muscle strength, balance and coordination in individuals with Parkinson's disease, facilitating the performance of activities of daily living and transfers, providing improvement in the quality of life of these patients. The Swiss ball can be used along with the PNF/Kabat method with patients suffering from Parkinson's disease to trigger automatic movements by kicking, throwing or receiving a ball, facilitating movements with the upper and lower limb, promoting postural exercises and balancing training and coordination [20].

1.5 ACUPUNCTURE

Acupuncture is a centuries-old Chinese therapy, mainly used in the relief and treatment of various pathologies, such as acute and chronic pain, anxiety and depression, treatment of nausea and vomiting, helping to improve symptoms and improve quality of life of patients [21].

In Chinese Medicine, Parkinson's disease appears under the symptom of "seizures" always being related to the Liver Wind (Gan). Tremors are caused by penetrating Liver Wind (Gan) and Qi of meridians rebelling upwards, this causes "tics" on the face and tremors of the limbs. The proper functioning of the body's motor activities depends on the proper nutrition of the tendons, which in turn depends on the sufficient amount of Blood (Xue) stored in the Liver (Gan). In this

case, liver deficiency (Gan) does not adequately provide the nutrition of the tendons [22].

Thus, the treatment of PD by Acupuncture aims at toning the kidneys, liver, and spleen; nutrition\toning blood; restore the gentle flow of Qi and Blood in the muscles and joints and; moisture/phlegm for a better result of the symptomatology of this disease [23].

1.6 KINSIOTHERAPY

The use of kinesiotherapy in patients with Parkinson's disease in the early stages is of paramount importance, since physiotherapeutic interventions may involve both the evaluation and choice of kinesiotherapeutic techniques, keeping the patient independently, as much as possible, providing an improvement in quality of life and their activities of daily living [24].

Kinesiotherapy is extremely important to maintain, improve and prolong the quality of life of the individual with Parkinson's diagnosis. Within kinesiotherapy, more specific exercises are used, such as stretching, strengthening, balance training among others, using resources such as weights, balls, bands, which help in the practice of exercises aiming to eliminate or decrease function movement disorders, returning to the patient a better quality of life, returning their functional activities [25].

We can correlate kinesiotherapy with the disabilities caused by Parkinson's disease, since therapeutic exercises aim at the general

improvement of impairments, aiming at the gain of functionality for the maintenance of efficient mobility to practice independently of activities of daily living. Regular physical exercise is beneficial for patients with PD, as it reduces symptoms such as bradykinesia and gait disorders being an important tool in the aid of drug therapy [26].

1.7 VIRTUAL REALITY FOR TREATMENT PURPOSES

Virtual reality (VR) is a technology that allows individuals to interact with a virtually created place. It provides movement, interaction, activities in three-dimensional environments and enables users to obtain better motor learning. Within VR, the use of virtual reality glasses requires that the individual have to make slight multidirectional changes centrally controlling their center of gravity with exercises and through repetition and motivation [27, 28].

Use of virtual reality games has been increasingly frequent in the rehabilitation of patients with Parkinson's disease since method offers a safe and stimulating way to train functions such as trunk balance, dynamic balance, functionality of upper limbs, functional mobility, cardiorespiratory conditioning, and other aspects that end up directly influencing the perception of the patient's quality of life [29].

VR treatment may promote greater interaction

of motor and cognitive skills simultaneously, which is required by most activities of daily living (ADL). Thus, it will contribute to greater independence in ADLs compared to training based only on motor stimuli [30].

2. MATERIALS AND METHODS

The methods used for this work were based on the methodology of the experimental article Planning Factorial: A brief Review de (OLIVEIRA et al., 2018), published in the journal International Journal of Advanced Engineering Research and Science (IJAERS).

To identify the articles on the subject, a search was carried out in the databases PubMed, Scielo, Google Scholar, Microsoft Academic. Parkinson's is a degenerative disease that brings physics functional limitations, directly interfering in the quality of life of these patients, whose main symptoms are stiffness, bradykinesia, tremors, and postural changes. Physiotherapy uses its resources to offer its patients better development concerning activities of daily living. The search strategy on the subject consisted of the use of English keywords: 1.physiotherapy, 2. Parkinson's, 3. Treatment, 4.quality of life.

After consulting the databases and applying the search strategy, repeated studies were identified between the different searches. The inclusion criteria of the articles were: original and research articles that conceptualize the quality of

life of patients diagnosed with Parkinson's disease, relating physiotherapeutic treatment to the symptomatology of the disease. The study was carried out in different types of research fields, covering research completed in the Portuguese, English and Spanish languages.

The deleted articles were grouped into the order: repeated, irrelevant, review, other publishing formats (edict, short communications, perspectives, letters), and other languages. Besides, manual searches were made in bibliographic references of review articles found with predetermined keywords.

2.1 RESULTS

After removing repeated articles between the different searches, the exclusion criteria were applied, as shown in Figure 1.

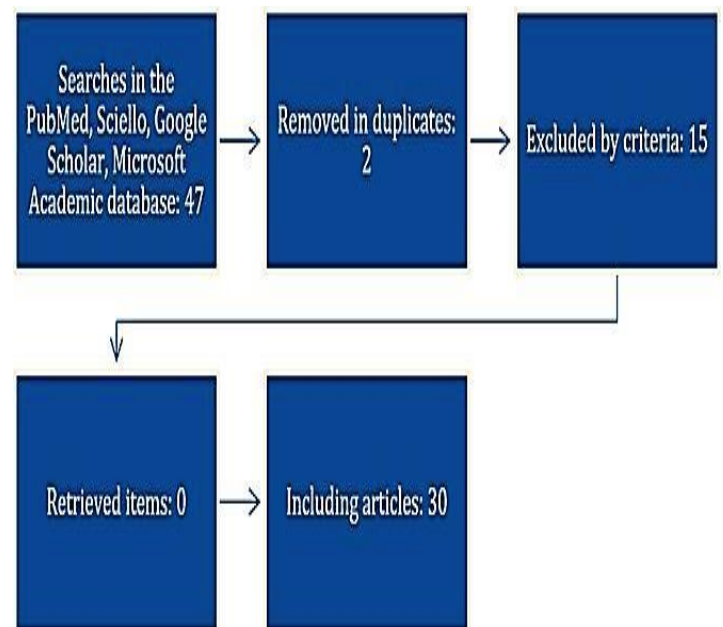


Fig. 1. Flowchart of identification and selection of articles. (Prepared by the authors, 2020).

The articles for use in this review, after exclusion criteria, were related is correlated homologously with the physiotherapy treatment of secondary sequelae generated by Parkinson's disease, considering the improvement in the quality of life of patients.

3. RESULTS AND DISCUSSION

Due to the studies done, several physiotherapeutic techniques for Parkinson's disease were explicit, which was previously hardly used as a therapy for diagnosed patients.

Currently, treatment is used jointly with medication, always aiming at the functional independence of Parkinsonians.

Although Parkinson's disease is a degenerative disease, her symptomatology can be relieved. The physiotherapist consists of the multidisciplinary team in the rehabilitation of these patients, employing techniques with the objective of motor treatment, avoiding postures

vices, improving balance for gait development, minimizing declines cognitive and neuromuscular complications, in addition to preventing future complications during the disease.

Thus, neurofunctional physiotherapeutic techniques for the treatment of diagnosed patients go far beyond conventional therapy. Using the cyniological knowledge together with the technology the functional quality of these patients gradually evolves into a motor performance where they can develop their activities more easily.

Next, an illustrative graph presents the physiotherapeutic treatments highlighted in the scientific environment in which the most currently being studied are being studied, because they are the ones that have shown the most satisfactory results in patients diagnosed with Parkinson's.

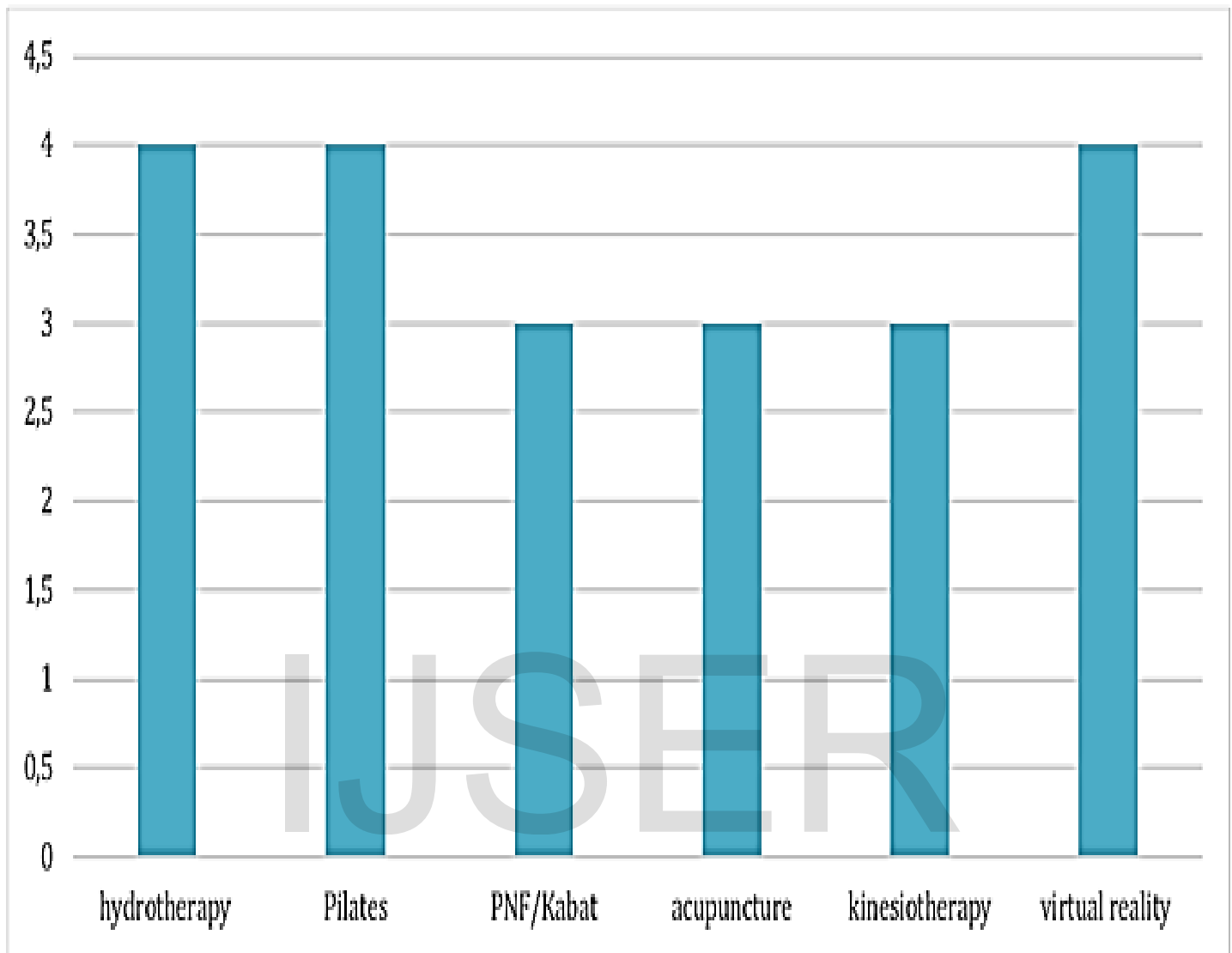


Fig. 2. Graph/Quantitative number of studies conducted by authors on the most used physiotherapy techniques for the treatment of Parkinson's disease. Source: (Elaborated, by the authors 2020).

Parkinson's treatment may also be framed as palliative care as soon as it is a neurodegenerative disease. Moreover, it would in no way be hasty to say that there are great possibilities for these patients to develop their quality daily activities (acting within their limitations), as soon as the physiotherapist should always have this as the main objective

for the treatment of the disease.

For these conclusions, digital platforms were used as a basis for studies and research, such as online journals and scientific journals, in addition to medical information, we can report the improvement in the quality of life of these patients, cited in Figure 2 of this denoting the physiotherapeutic techniques and origins.

TABLE 1: Containing the relationship between the physiotherapeutic approaches the main authors who researched on the subject. Source: (Elaborated, by the authors 2020).

Physiotherapeutic techniques in the treatment of Parkinson's	Reference	Total
Hydrotherapy	CALDERARO; AMADEI; CONTER, (2015)	4
	SILVA et al., (2013)	
	DE MELO MOREIRA; DE SOUSA CASSIMIRO; RODRIGUES, (2018)	
	JAMILLE et al., (2017)	
Pilates	DE FREITAS, (2016)	4
	DA SILVA, (2016)	
	MENDES, (2017)	
	BERNARDI, (2017)	
Proprioceptive Neuromuscular Facilitation (PNF)/ Kabat	DOS SANTOS LIMA; SANTOS; BARROS FILHO, (2019)	3
	COSTA et al., (2016)	
	MARQUES, (2017).	
Acupuncture	OLIVEIRA; OLIVEIRA, (2017)	3
	LIMA; MEJIA, (2016)	
	TURATI, LEANDRO, (2016)	
Kinesiotherapy	DE OLIVEIRA FONSECA, (2016)	3
	ANDRADE et al., (2017).	
	GONDIM et al., (2016)	
Virtual reality for treatment purposes	DE MEIRELES LIMA et al., (2017)	4
	VIEIRA et al., (2014)	
	NOGUEIRA et al., (2018)	
	ROCHA; ROSSATO; SCHMIDT, (2019).	

In Chart 3, it exposes some of the different treatments for Parkinson's disease reported before the bibliography cited in recent years. Each technique is used in a specific way,

working together or not acting in performance, physical conditioning and working the individual as whole acting within its functional limitations.

CLINICAL MANIFESTATIONS OF PARKINSON'S DISEASE CORRELATING WITH THE THERAPY STUDIED	
Tremors	Tremor is the most common symptom of Parkinson's, being one of the criteria for the diagnosis of the disease. Among the physiotherapeutic treatments that assist in the treatment of tremors according to the literature, pilates is essential for the patient, so the technique requires concentration to perform the exercises allowing the patient a better performance in his/her daily tasks.
Rigidity	After clinical diagnosis, the patient develops a probability of a psychological decline, directly influencing immobilism syndrome that contributes to the progression of the disease symptomatology. Stiffness is treated in the face of the techniques mentioned through kinesiotherapy using passive exercises in more severe and active cases in patients who already have better physical conditioning.
Bradykinesia	Bradykinesia is characteristic of the patient with Parkinson's diagnosis, the individual responds slowly to the motor and psychic stimulation. Technological treatment in this dysfunction becomes essential for the development of the patient, so virtual reality games offer simply and broadly the best motor and even psychological capacity for these patients.
Postural changes	With the development of the disease, the patient acquires the flexor pattern (interiorized head and shoulders, along with the cervical spine). The physiotherapeutic resources widely used according to the literature hydrotherapy and pilates are used to prevent and rehabilitate these addictions, minimizing pains that cause discomfort during daily activities.
Macha disorders	One of the biggest challenges of the physiotherapeutic clinic is to minimize the effects of lack of balance in these patients, preventing falls and future orthopedic fractures. Hydrotherapeutic treatment to strengthen the musculature of MMII along with virtual reality for the resourcefulness of motor coordination since it is affected due to Parkinson's gait.

As reported in Chart 4, all techniques in the present study are effective for the performance of parkinsonian patients. Acupuncture enters as therapeutic for all major symptoms, helping other techniques increasing the functional capacity of this patient and reducing the complications generated by immobilism. The PNF/ Kabat works directly with a neural disability, working on cognition and motor coordination of these individuals.

2 CONCLUSION

Physiotherapy for Parkinson's disease plays an important role in the treatment of the disease, as it provides an improvement in the general physical state of the patient, having as main objective the restoration or maintenance of function and incentive to perform life activities independently, ensuring a better quality of life.

Parkinson's patients must undergo a specific

treatment program, addressing techniques that stimulate scans of movements aimed primarily at a better quality of life. Physiotherapy with activities oriented towards gait and balance training in different terrains, global strengthening and stretching exercises to avoid weakness and muscle shortening, as well as joint stiffness is extremely important for motor and non-motor symptoms of these patients.

Physiotherapeutic treatment is often offered to those with Parkinson's as part of a multidisciplinary approach to treatment and aims to improve the quality of life of those living with the disease. Therefore, more scientific evidence is needed regarding the application of the technique about the symptomatology of the disease.

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