

Can A Patient with Multiple Sclerosis Demonstrate Improved Urge Incontinence with Physical Therapy Interventions: A Case Study of Pelvic Floor Training

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Abstract

Purpose: To determine the prevalence of improved Urge Incontinence (UI) with physical therapy interventions, in woman with MS.

Methods: Forty-two-year-old woman diagnosed with MS in 2013. She had been experiencing increased urgency in the last year. The patient was referred to physical rehabilitation by the neurologist for UI for bladder training. The patient received 12 sessions including: breathing and relaxation exercises, pelvic floor specific exercises, behavioral therapy (bladder training), and magnetic field stimulation, twice/week for six weeks.

Results: There was significant improvement at the muscle power of the pelvic floor muscles increased one grade from 2/5 to 3+/5, decrease tone and increase length of the pelvic floor muscles, reduce frequency of urination from 16/day to 12/day, started to urinate every two hours instead off every thirty minutes, pads decreased from 6 pads/day to 1 pad /day.

Conclusions: The physical therapy interventions in the patient with multiple sclerosis and urge incontinence showed satisfactory results reducing urinary incontinence symptomatology and improving the patient's quality of life.

Key words: Urinary Incontinence, urge incontinence; Multiple Sclerosis, magnetic field, physical therapy modalities

Introduction

Multiple Sclerosis (MS) is an autoimmune, inflammatory, chronic disease that results in demyelinating lesions of the central nervous system. It affects women 3 times more often than men [1]. Among the many symptoms that can occur, bowel, bladder, and sexual dysfunctions have been found in as many as 75% of the cases of men and women with the disease [2]. Urgency and urge incontinence are most frequently reported [2]. Urinary dysfunction may affect social relationships and activities of these patients. Moreover, urinary disorders can sometimes lead to permanent urological alterations [2]. Urge Incontinence (UI) is a type of urinary incontinence that causes an urgent, uncontrollable need to pee several times during the day and night. The patient may leak urine before reaching the bathroom [3]. Previous studies have

shown statistically significant improvements for patients with urinary incontinence if pelvic floor muscle training is incorporated in treatment. Only a few studies reported MS relating to UI and how physical rehabilitation is improved [3]. Up to date, the prevalence of urge incontinence improvement with pelvic floor muscles training using pelvic floor exercises and magnetic field stimulation has not been studied previously in MS patients.

Magnetic Field Stimulation (MFS) is a technology introduced in 1998 that has been used for stimulating the pelvic floor muscles [4]. It is based on Faraday's law of magnetic induction, whereby a time-varying magnetic field induces electrical activity that depolarizes the nerves and causes contraction of the pelvic floor muscles. Repeated activation of the terminal motor nerve fibers

and the motor end plates will tend to build muscle strength and endurance [4, 5]. The roots of sacral nerves S2-S4 provide the primary autonomic and somatic innervation of the urinary bladder and urethra, vaginal wall and rectum, and pelvic floor muscles. Stimulation of these roots is an efficient way to modulate the pelvic floor and subsequently control the pelvic organs [6, 7]. This method is used for treating all types of urinary incontinence. MFS aims to moderate the habit of frequent voiding through practicing resisting the urge to void, postponing micturition, and increasing the voiding interval, which improves the bladder capacity and decreases detrusor instability.

It is painless and does not require a probe. Its advantage is that the magnetic field penetrates body tissues without significant alteration and passes uninterrupted through clothing, and there is no need for the patient to undress [4]. The main stimulation targets in UI, the afferent branches of the pudendal nerve are stimulated to inhibit the detrusor muscle through central reflexes; at the same time, the efferent nerve branches are also stimulated to facilitate strengthening of the pelvic floor muscles and increase the tonus of the urethral sphincters, thereby inhibiting the detrusor muscle through the guarding reflex [8]. Thus, this case study seeks to

determine the prevalence of improved urge incontinence with physical therapy interventions such as breathing and relaxation exercises, pelvic floor specific exercises, bladder training and magnetic field stimulation, in woman with MS.

Case Description

Patient history

This case study looked at a 42-year-old woman diagnosed with MS in 2013. The first attack caused facial palsy, temporarily impaired vision; heaviness of lower extremities left more than right led to neuropathic gait. Last year started to experience an urgency to urinate and was unable to reach the bathroom without wetting her outerwear. Had four children, normal delivery, drink four cups of coffee per day, and 10 glasses of water, frequency of urination per day 16 times/day, frequency of urine leakage at least twice/day wetting her outer wear, and she used 5 small pads /day. Ambulated with wheeled walker with closed supervision. Unable to socialize and joined family gatherings because of the urge incontinence problem. The patient was referred to physical therapy by her neurologist for urge incontinence for treatment and bladder training. Arrived at the clinic in a wheelchair with a sitter.

Assessment

Observation / External examination Table 1

Table 1: Observation / External examination.

Muscle palpation: Check the connective tissue elasticity for the following muscles	
1-Abdomen and suprapubic area	Normal
2-Pelvis, Labia, Perineum area, through groin area, ischial tuberosity (IT), and anterior through suprapubic	Moderate restriction.
3-Medial and lateral thighs	Normal
4- Buttocks	Normal
5-Upper thighs	Normal
6-Lower back	Normal
External Muscular Assessment: Trigger points	Normal
Visual inspection of Vulva/Vestibule/Pelvic Floor Muscle:	The perineal reflex and anal wink were normal,
Q-Tip Test:	Normal

Internal examination

Internal Pelvic Floor Muscle Assessment Tone is minimally increased globally. Connective tissue lateral to urethra and urethral sphincter were minimally increased.

Urogenital diaphragm: bilaterally minimally decreased length.

Trigger points: No trigger points.

Table 2: Specific measurement of the pelvic floor muscles.

Measurement	Oxford muscle scale
Muscle power	5-Feb
Endurance	10-Mar
Repetition	10-Apr
Fast contraction	10-Mar

Findings

Minimally increase tone and shortening of the pelvic floor muscles. Moderate to greater decrease in Pelvic floor muscles strength, endurance, repetition, and fast contraction as shown at Table 2. She is a way of some social activities and family gathering and unable to walk outside home. She had Urge Incontinence (UI) confirmed by patient history and urodynamic test.

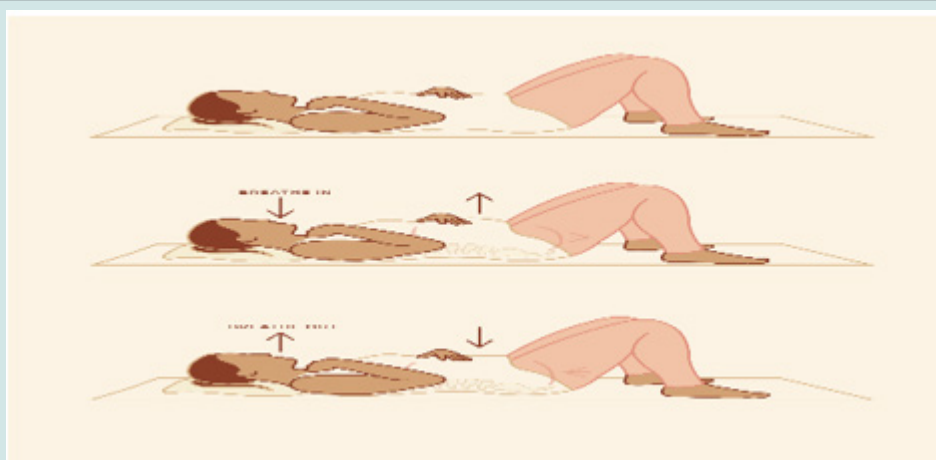
Intervention

Initial Treatment Plan: PT twice a week for 6 weeks (12 sessions): Treatment to include:

A. Breathing exercise

1. Starting position: lie on the back with knees bent, feet hip-width apart.
2. One hand on the chest, and the other at the top of the abdomen.
3. Inhale, allowing the air to fill the belly and all the way into the pelvic floor.
4. The patient will feel the pelvic floor muscles expanding away from the body.
5. Exhale, letting everything settle back into resting position, the pelvic floor moving closer to the body. Figure 1
6. Repeat 10 times, once/day.

Figure 1: Breathing exercise.



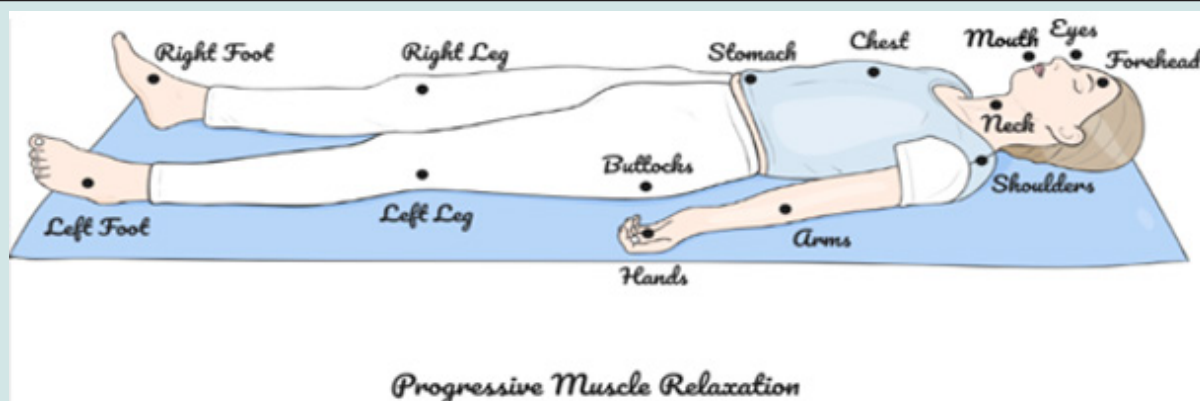
B. Relaxation, and muscle control techniques

1. Sit or lie down in a comfortable position while breathe slowly, starting with the toes and feet, and then squeezing the muscles tightly during inhalation. Counting to 5, then relaxing

during exhalation. Repeat two more times.

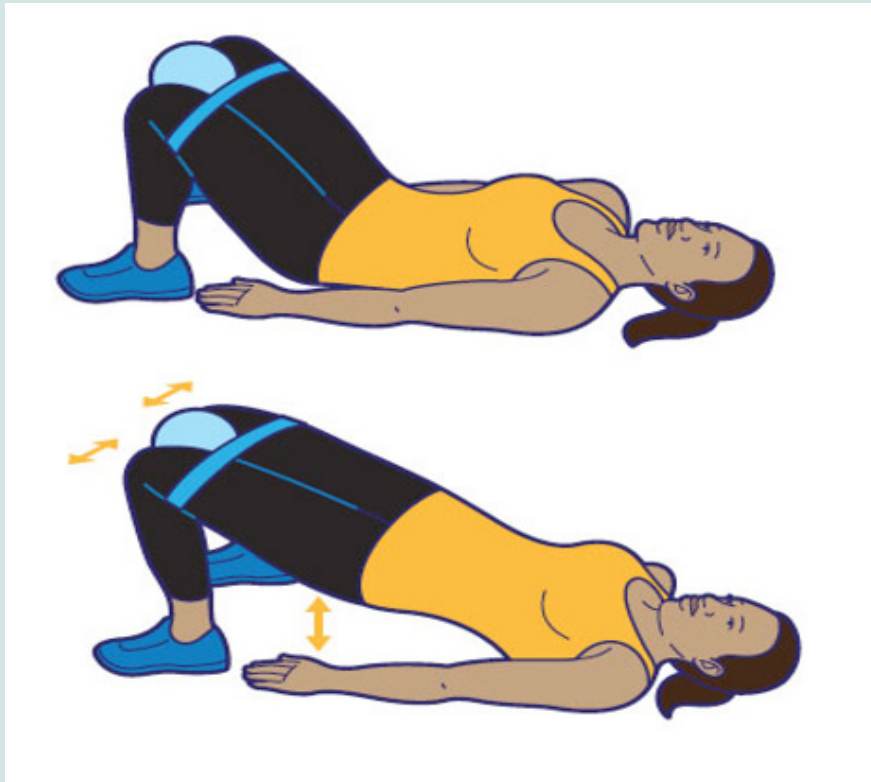
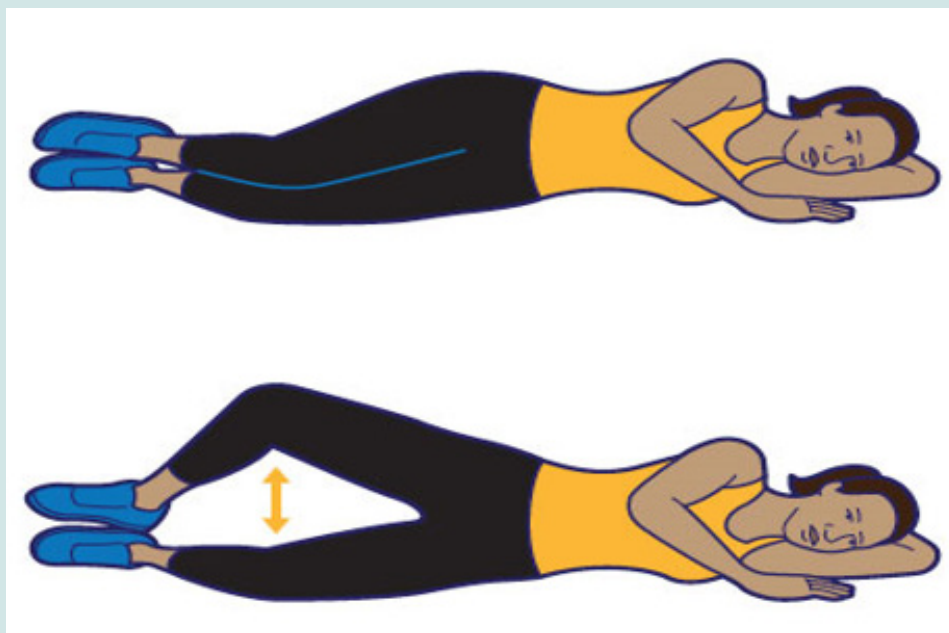
2. Then do the same for all the other muscles in the body, progressing through legs, stomach, arms, shoulders, and neck. Figure 2

Figure 2: Relaxation Technique.

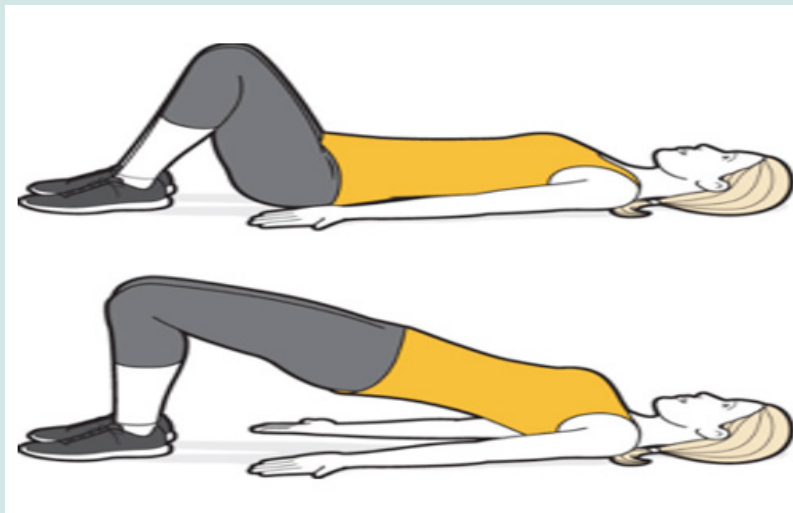


C. Pelvic Floor Specific Exercises

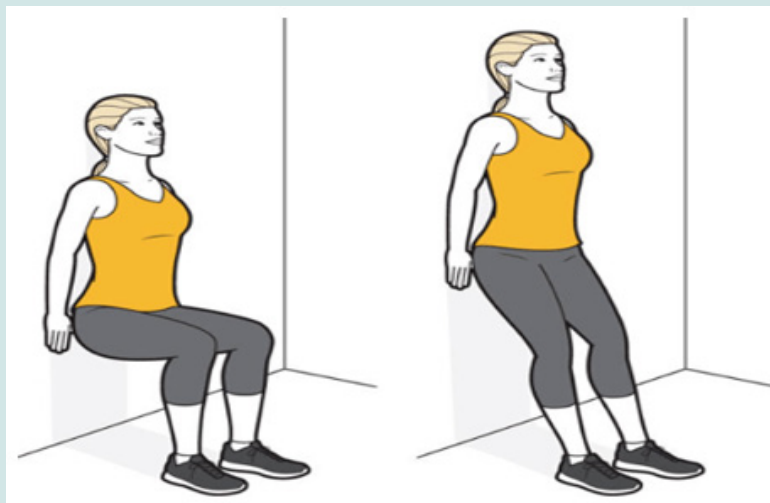
1. Lie on the back and position a small, inflatable exercise ball between the knees, and loop a small resistance band around the outside of the knees.
2. Place the feet on the floor, with knees bent.
3. Lift the hips into a bridge position, then alternate gently pressing the knees in against the ball and out against the resistance band together with contraction of the pelvic floor.
4. Repeat 10 times once/day. (Figure 3,4)

Figure 3: Bridge with Hip Rotations.**Figure 4: Side Clamshell.**

1. Lie on the side with the hips stacked and knees bent. Stabilize with a hand on the floor in front of you. Lift and contract the pelvic floor muscles and begin to lightly exhale.
2. Keeping the feet together, open the legs like a clamshell as far as comfortable.
3. Pause for one or two seconds with your knees open, then return to the starting position and release the pelvic-floor contraction.
4. Repeat 10 times once/day. (Figure 5)

Figure 5: Bridge.

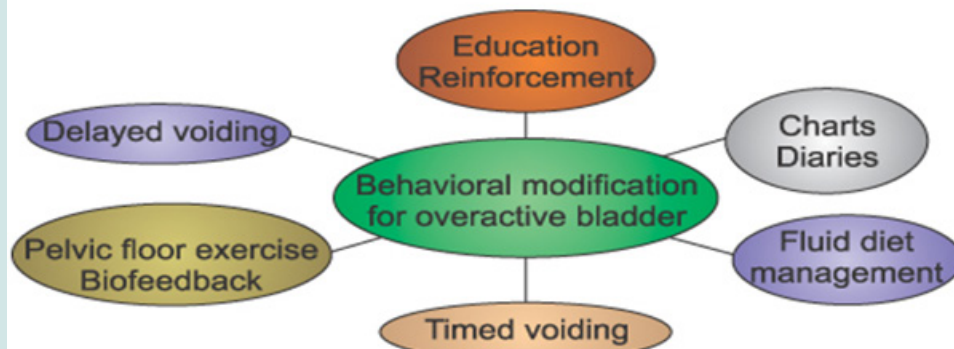
1. Lie on the back with the knees bent and feet hip width apart.
2. Inhale and engage pelvic floor as the hips lift up toward the ceiling.
3. Hold for 5 seconds and then relax the muscles.
4. Repeat 10 times once/day.

Figure 6: Wall Squat.

1. Stand against a wall with your feet hip-width apart.
 2. Inhale and engage the pelvic floor muscles as you lower into a squat.
 3. Hold for 5 seconds and then release these muscles.
 4. Rest for 10 seconds and repeat 10 times once/day.
- D. Bladder training behavioral therapy Figure 7**
1. The goal of this exercise is to increase the amount of time between emptying the bladder and the amount of fluids the bladder can hold.
 2. Decrease caffeine intake and increase water intake (fluid diet).

3. Practice Kegel exercise to delay emptying the bladder. 30 minutes (1 hour and 30 minutes).
4. Charts diaries: to register time of urination and leakage: 7. Week 3 and beyond: Increase the time between bathroom visits by 30 minutes each week. (Using bathroom every three hours).
5. Week 1: Empty the bladder every hour during the day.
6. Week 2: Increase the time between visits to the toilet by

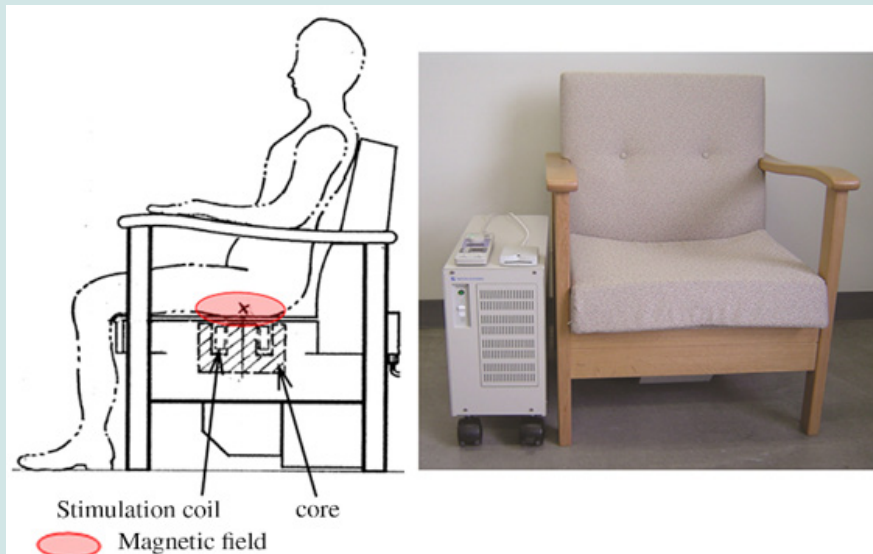
Figure 7: Bladder Training.



E. Magnetic Field Stimulation

Frequency: 2-50 Hz. 5 Min time on, 5 Min. time off, 20 min. power 100% 2/week.

Figure 8: Magnetic field Stimulator.



i. Findings:

The following goals were set for the patient after her initial evaluation with the following outcomes:

1. Increase strength of the pelvic floor by 1 pelvic floor muscle grade from 2/5 to 3/5, to reduce the leaking of urine before she reaches bathroom and reduce frequency of urination, to allow the patient to be more socialized.
2. Goal met- demonstrated a 3+/5 pelvic floor muscle grade at her 9th. Visit, frequency of urination decreased from 16/day to 12/day, no more leakage before she

reaches bathroom.

3. Decrease resting tone and length of the pelvic floor to allow the patient to better empty her bladder and reduce the frequency of urination to allow the patient to be more active with her family activities.
4. Goal met- reported urinating every 2 hours and reported no urine leakage, going from 6 pads daily to 1 pad daily at her 11th. Visit.

Discussion

The aim of this case study was to determine whether the current study support the effectiveness of physical therapy modalities as a treatment for UI and QOL in woman with MS. The findings of this study showed significant improvement for the incontinence leakage episodes, frequency of using bathroom, muscle power of the pelvic floor and QOL. That goes with Valerie Block, et al. 2014, who did literature review and reported that, physical therapy protocols that included pelvic floor muscle training, electrical stimulation, or biofeedback were effective in reducing the frequency of urinary incontinence and in increasing quality of life (QOL) for people with MS compared with pretreatment and control groups not receiving the intervention [9]. Additionally, Data published by the National Association for Continence show that patients with incontinence are largely unaware of the options and benefits of PT interventions. Published data from future studies could help solidify the benefits of non-pharmaceutical or surgical interventions for this population [10]. Additionally, this woman with MS who participated in this study shared her experiences of living with MS and incontinence. Woman shared that it was very important to her self-esteem for her to contain her urine because she perceived that other viewed adult incontinence as unacceptable. The woman felt incontinence was an intensely private issue in her lives and had been reluctant to divulge her experience or seek assistance prior to her involvement in the study. This may be a clinical practice issue for health professionals to consider. If clients are silent about incontinence, it may not necessarily mean they are not experiencing it. The health professional may sensitively need to break the silence with the client.

Limitations

There were several limitations in this study; MS is a degenerative and unpredictable disease, hindering formulation of a standard treatment plan for everyone. A benefit of PT interventions may be that the dose, duration, and combination of treatments can be easily modified for everyone. The study lacked a retention follow-up test to assess the long-term change.

Future Directions

Future studies should look at specific types of MS with different forms of incontinence to determine the types of treatment that are most effective and efficient for each demographic feature. Examination of specific PT interventions with larger sample sizes could provide clinical practice guidelines for treating people with

MS through conservative means. Longer follow-up studies would help determine the lasting effects of PT interventions and would shed light on the learning aspects of the treatment protocols. Furthermore, Future studies may determine whether physical therapy improves QOL because of the direct effect on incontinence leakage episodes or because change in urinary incontinence affects other factors, such as fatigue, time required for activities of daily living, and depression, that contribute to poorer QOL.

Conclusion

Urge Incontinence is a prevalent problem in the MS population. Physical therapy interventions can help reduce the negative effects of UI by decreasing some of the symptoms and increasing QOL. The physical therapy modalities in this case study showed satisfactory results reducing urinary incontinence episodes, pads used daily and improving the patient's quality of life.

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