

CASE REPORT OF A 60-YEAR-OLD FEMALE WITH RECTOSIGMOID MALIGNANCY POST-ANTERIOR COLON RESECTION IN SEVERE MALNUTRITION: A NUTRITION INTERVENTION

Rini Siallagan¹, Etisa Adi Murbawani², Probosari Enny³

Department of Clinical Nutrition, Faculty of Medicine Udayana University, Udayana
University Hospital, Bali Indonesia¹

Department of Geriatric, Faculty of Medicine Diponegoro University, Dr. Kariadi General
Hospital, Semarang Indonesia²

Department of Digestive Surgery, Faculty of Medicine Diponegoro University, Dr. Kariadi
General Hospital, Semarang Indonesia³

e-mail: rinisiallagan17@gmail.com¹, etisatitit@gmail.com², probosarienny@yahoo.com³

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ABSTRAK

Kanker kolorektal merupakan salah satu keganasan dengan insidensi yang terus meningkat, terutama pada populasi lanjut usia yang memiliki kerentanan lebih tinggi terhadap malnutrisi akibat perubahan fisiologis penuaan, penyakit penyerta, dan tindakan pembedahan. Kondisi tersebut dapat memperlambat pemulihan pascaoperasi serta menurunkan kapasitas fungsional sehingga memerlukan intervensi nutrisi yang terencana dan berkelanjutan. Laporan *kasus* ini bertujuan menggambarkan implementasi intervensi nutrisi individual pada pasien geriatri dengan malnutrisi berat pasca reseksi kolon anterior serta mengevaluasi perubahan kapasitas fungsional menggunakan *handgrip strength*. Subjek penelitian adalah seorang perempuan berusia 60 tahun dengan keganasan rektosigmoid yang menjalani perawatan di RSUP Dr. Kariadi Semarang. Intervensi meliputi pemberian terapi nutrisi bertahap sesuai kebutuhan, suplementasi protein dan mikronutrien, serta pemantauan status klinis, elektrolit, dan *handgrip strength* selama perawatan hingga tindak lanjut rawat jalan. Hasil menunjukkan tidak ditemukan komplikasi pascaoperasi maupun tanda *refeeding syndrome*. Nilai *handgrip strength* meningkat dari 12 kg menjadi 15 kg pada saat pasien dipulangkan, disertai perbaikan kemampuan mobilisasi, sementara berat badan dan lingkaran lengan atas tetap stabil selama masa observasi. Temuan ini menunjukkan bahwa intervensi nutrisi yang terindividualisasi berpotensi mendukung pemulihan fungsional secara aman pada pasien geriatri pascaoperasi kanker kolorektal, sehingga layak dipertimbangkan sebagai bagian integral dari tata laksana multidisiplin untuk meningkatkan luaran klinis dan kualitas hidup pasien.

Kata Kunci: Kanker Kolorektal, Malnutrisi Berat, Handgrip Strength.

ABSTRACT

Colorectal cancer is one of the most prevalent malignancies worldwide, with an increasing incidence, particularly among older adults who are more vulnerable to malnutrition due to age-related physiological changes, comorbidities, and surgical interventions. This condition may delay postoperative recovery and impair functional capacity, highlighting the importance of individualized and continuous nutritional management. This *case report* aimed to describe the implementation of an individualized nutritional intervention in a geriatric patient with severe malnutrition following anterior colon resection and to evaluate changes in functional capacity

using *handgrip strength*. The subject was a 60-year-old woman with rectosigmoid malignancy who was treated at Dr. Kariadi General Hospital, Semarang. The nutritional intervention consisted of a gradual nutrition support program tailored to the patient's requirements, combined with protein and micronutrient supplementation, while clinical status, electrolyte levels, and *handgrip strength* were monitored throughout hospitalization and outpatient follow-up. The patient experienced no postoperative complications or signs of *refeeding syndrome*. *Handgrip strength* improved from 12 kg to 15 kg at discharge, accompanied by enhanced mobility, whereas body weight and mid-upper arm circumference remained stable during the observation period. These findings suggest that individualized nutritional intervention may safely promote functional recovery in geriatric patients following colorectal cancer surgery and should be considered an integral component of multidisciplinary care to optimize clinical outcomes and improve quality of life.

Keywords: *Colorectal Cancer, Severe Malnutrition, Handgrip Strength.*

INTRODUCTION

Colorectal cancer remains one of the leading causes of cancer-related morbidity and mortality worldwide, with its incidence continuing to rise in parallel with socioeconomic development and population aging. According to Global Cancer Statistics 2020, colorectal cancer ranks among the three most frequently diagnosed malignancies globally and represents a substantial public health burden due to its high incidence and mortality (Sung et al., 2021). Beyond its increasing incidence, the growing number of older adults undergoing colorectal cancer treatment has created substantial clinical challenges because postoperative recovery is often influenced not only by tumor characteristics but also by age-related physiological decline. This situation underscores the need for clinical reports that describe practical management strategies in elderly patients with complex postoperative conditions.

Older adults with colorectal cancer present distinctive clinical characteristics because physiological aging is frequently accompanied by reduced organ reserve, multiple chronic comorbidities, polypharmacy, frailty, and declining functional capacity. These conditions substantially influence treatment tolerance, postoperative recovery, and long-term prognosis. Recent evidence demonstrates that frailty is an independent predictor of one-year survival among elderly patients with advanced solid tumors, emphasizing that comprehensive geriatric assessment should become an integral component of oncology care rather than relying solely on chronological age (Satrio et al., 2025). Likewise, nutritional screening among geriatric populations has become increasingly important because age-related physiological changes often predispose patients to nutritional problems that adversely affect clinical outcomes and quality of life (Sari et al., 2026). Accordingly, postoperative management in geriatric oncology requires greater attention to modifiable clinical factors that may enhance recovery beyond conventional surgical treatment.

Malnutrition is one of the most frequent and clinically significant complications experienced by patients with colorectal cancer, particularly during the postoperative period. Surgical stress, systemic inflammation, impaired gastrointestinal function, reduced dietary intake, and increased metabolic demands interact to accelerate the deterioration of nutritional status, thereby increasing the risk of delayed recovery, infectious complications, prolonged hospitalization, and reduced physical performance. A recent systematic review demonstrated that oral nutritional supplementation significantly improves nutritional status and supports postoperative recovery in patients undergoing colorectal cancer surgery, highlighting the

importance of structured nutritional management throughout the perioperative period (Qin et al., 2024). Consistent with these findings, Mulyati et al. (2025) reported that appropriate nutritional therapy contributes not only to improvements in nutritional status but also to immune function and overall quality of life among patients with cancer. Furthermore, individualized nutritional care based on a standardized nutrition care process has been shown to facilitate more effective management of postoperative cancer patients experiencing malnutrition and complex nutritional problems (Aisyah & Batubara, 2025).

Despite growing evidence supporting nutritional intervention in oncology, important knowledge gaps remain regarding its implementation in elderly patients with colorectal cancer following surgical treatment, particularly in relation to functional recovery outcomes. Previous studies have predominantly emphasized changes in nutritional indicators or postoperative complications, whereas objective evaluation of functional improvement using handgrip strength remains relatively limited in postoperative geriatric oncology patients. Recent studies indicate that handgrip strength is strongly associated with functional status and health-related quality of life in patients with colorectal cancer, suggesting its potential as a practical clinical indicator for monitoring recovery (Barbosa et al., 2023). In addition, GLIM-defined malnutrition has been reported to significantly predict postoperative complications and long-term prognosis among elderly patients undergoing colorectal cancer surgery (Shen et al., 2023). This limited clinical documentation creates an important evidence gap, particularly regarding how individualized nutritional intervention is translated into daily clinical practice and reflected in serial functional improvement among postoperative geriatric patients.

Malnutrition in older adults with colorectal cancer extends beyond inadequate energy intake because it is frequently accompanied by progressive loss of skeletal muscle mass, impaired immune function, and declining physical performance, all of which may compromise treatment effectiveness. Consequently, nutritional rehabilitation should be viewed as a comprehensive therapeutic strategy that aims not only to restore nutritional status but also to improve functional capacity and readiness for subsequent oncological treatment. Recent evidence has emphasized that nutritional rehabilitation should adopt a beyond calories approach by integrating individualized dietary management, metabolic optimization, and continuous functional evaluation to achieve better clinical outcomes in patients with complex comorbidities (Devi & Rahman, 2026). Similar observations have been reported in geriatric oncology, where individualized nutritional intervention has been shown to contribute to improved clinical recovery and support patients' ability to continue definitive cancer therapy (Mulyati et al., 2025; Qin et al., 2024). However, reports illustrating the implementation of these recommendations in individual postoperative patients remain relatively scarce.

Functional recovery represents one of the most important therapeutic goals following colorectal cancer surgery, particularly among older adults who are vulnerable to prolonged disability and reduced independence. In recent years, handgrip strength has gained increasing attention as a practical, objective, and non-invasive indicator for evaluating muscle function, nutritional status, and overall physical performance in geriatric patients. Community-based studies have also demonstrated that routine measurement of handgrip strength is feasible and valuable for early detection of declining muscle function among older adults, supporting its application in routine clinical assessment (Tambunan et al., 2025). Furthermore, postoperative recovery is influenced not only by nutritional therapy but also by timely rehabilitation and mobilization, which together contribute to restoration of functional capacity and acceleration of physical recovery (Wahyuningsih & Khasanah, 2026). Nevertheless, serial functional

monitoring using handgrip strength has rarely been presented as one of the primary clinical outcomes in published postoperative colorectal cancer case reports.

Although numerous studies have examined nutritional management in oncology, relatively few have specifically reported postoperative nutritional intervention in geriatric colorectal cancer patients using objective functional indicators as the primary measure of recovery. Existing publications have predominantly focused on nutritional status, postoperative complications, or survival outcomes, whereas longitudinal monitoring of functional improvement through handgrip strength remains limited, particularly in case report publications. Reports describing nutritional care in elderly patients with gastrointestinal malignancies have demonstrated the clinical importance of individualized nutritional management; however, documentation of functional recovery following intervention remains insufficient (Leonarisabila & Iskandar, 2026; Aisyah & Batubara, 2025). Therefore, additional case-based evidence is needed to demonstrate how structured nutritional care can be implemented in routine clinical settings while simultaneously documenting measurable functional changes during recovery.

Based on these considerations, the present case report describes the nutritional management of a 60-year-old woman with rectosigmoid malignancy who developed severe malnutrition following anterior colon resection. The novelty of this report lies not merely in describing nutritional therapy, but in presenting a comprehensive clinical course that integrates individualized nutritional intervention with serial handgrip strength assessment as an objective measure of functional recovery during hospitalization and follow-up. By emphasizing both nutritional and functional responses in a geriatric postoperative patient, this report provides practical clinical evidence that complements existing literature, which has largely focused on nutritional outcomes alone. Therefore, this case report aims to demonstrate the clinical response to individualized nutritional intervention and to emphasize the importance of incorporating nutritional assessment and functional monitoring into comprehensive postoperative care for older adults with colorectal cancer.

RESEARCH METHODS

This case report describes the nutritional management of a 60-year-old woman diagnosed with rectosigmoid adenocarcinoma accompanied by severe malnutrition following *laparoscopic anterior resection* with stoma formation at Dr. Kariadi General Hospital, Semarang. Clinical information was collected retrospectively from the patient's medical records, covering the period from hospitalization through outpatient follow-up. Publication of this case was conducted after the patient had provided written *informed consent* in accordance with the hospital's ethical regulations. To ensure confidentiality and protect patient privacy, all personal identifiers were removed in accordance with the ethical principles governing clinical research. Clinical evaluation included history taking, physical examination, laboratory investigations, *contrast-enhanced computed tomography* (CT), colonoscopy, biopsy, and histopathological examination to establish the diagnosis. Nutritional assessment was performed on *postoperative day* (POD) 2 by a clinical nutrition specialist using anthropometric measurements, evaluation of muscle and subcutaneous fat loss, the *Mini Nutritional Assessment–Short Form* (MNA-SF), and handgrip strength measurement with a handheld dynamometer expressed in kilograms (kg). Malnutrition was diagnosed according to the 2012 *American Society for Parenteral and Enteral Nutrition* (ASPEN) criteria, while the risk of *refeeding syndrome* was evaluated using the *IrSPEN guidelines*.

Nutritional intervention was implemented progressively according to the patient's energy and protein requirements, taking into account her clinical condition, treatment tolerance, and current clinical nutrition recommendations. Management included oral feeding, *oral nutritional supplements*, protein and micronutrient supplementation, as well as *parenteral nutrition* when oral intake was insufficient to meet nutritional requirements. Throughout hospitalization, dietary tolerance, electrolyte balance, wound healing, body weight, mid-upper arm circumference, and handgrip strength were monitored serially as indicators of nutritional status and functional capacity. These parameters were evaluated continuously to assess the patient's response to the individualized nutritional intervention and to detect potential complications during the postoperative period. Following hospital discharge, scheduled outpatient follow-up was conducted to monitor changes in nutritional status, dietary intake, wound healing, and functional capacity until the patient commenced the first cycle of chemotherapy.

RESULT AND DISCUSSION

Result

The initial clinical assessment was performed to establish a comprehensive understanding of the patient's condition before nutritional intervention was initiated. Baseline demographic, diagnostic, nutritional, and functional data were collected to identify clinical priorities and determine the level of nutritional risk. These parameters also served as the foundation for planning individualized nutritional management and evaluating subsequent clinical changes during treatment. The patient's baseline clinical characteristics are summarized in Table 1.

Table 1. Baseline Clinical Characteristics of the Patient

Parameter	Findings
Sex	Female
Age	60 years
Diagnosis	Rectosigmoid adenocarcinoma
CT findings	Rectosigmoid mass (9.12 cm); maximum wall thickness 2.14 cm; multiple liver metastases
Colonoscopy	Rectosigmoid mass
Histopathology	Rectosigmoid adenocarcinoma
Initial body weight	38 kg
Mid-upper arm circumference	18 cm
Initial <i>handgrip strength</i>	12 kg
Nutritional status	Severe malnutrition
Risk assessment	High risk of <i>refeeding syndrome</i>

Table 1 provides an overview of the patient's clinical complexity at the time of admission, demonstrating that the nutritional problem occurred in the presence of advanced colorectal malignancy accompanied by metastatic disease. The combination of severe

malnutrition, diminished functional capacity, and a high risk of refeeding syndrome indicates the need for careful nutritional management throughout the postoperative period. Rather than representing isolated findings, these baseline characteristics illustrate multiple interacting factors that may influence recovery. Consequently, the information presented in Table 1 served as the principal reference for monitoring the patient's response to nutritional therapy during hospitalization.

Evaluation of nutritional therapy requires continuous observation because clinical recovery after colorectal surgery is a dynamic process that may change throughout hospitalization. For this reason, serial monitoring was conducted to document nutritional intake, functional performance, biochemical stability, and overall clinical progress following surgery. Monitoring these parameters allows clinicians to assess treatment response and identify potential complications at an early stage. The chronological progression of the patient's clinical and nutritional parameters is presented in Table 2.

Table 2. Clinical Progress During Hospitalization

Parameter	POD 1	POD 2	POD 5	POD 6	POD 8 (Discharge)	Follow-up (1 month)
Body weight (kg)	38	38	38	38	38	39
Mid-upper arm circumference (cm)	18	18	18	18	18	18
Handgrip strength (kg)	12	–	–	–	15	Improved
Drain output (mL)	–	200	50	Drain removed	–	–
Energy intake (kcal/day)	1140	700	1000	1330	1330	Maintained
Protein intake	Gradually increased	Increased	Improved after PN	Target achieved	Maintained	Maintained
Electrolytes	Normal	Normal	Normal	Normal	Normal	Normal
Refeeding syndrome	Not observed	Not observed	Not observed	Not observed	Not observed	Not observed

Table 2 demonstrates that the patient's clinical condition remained stable throughout the observation period while nutritional management was progressively optimized according to postoperative needs. Functional improvement became evident through the increase in handgrip strength at discharge, whereas body weight and nutritional intake were successfully maintained despite the patient's severe nutritional risk. In addition, no electrolyte disturbances or clinical manifestations suggestive of refeeding syndrome were observed during serial monitoring, supporting the safety of the individualized nutritional strategy. Overall, the findings presented in Table 2 indicate a favorable clinical response that justified continuation of nutritional management during outpatient follow-up.

Clinical recovery following colorectal surgery should be evaluated not only through nutritional and functional indicators but also through direct observation of wound healing. Serial assessment of the surgical site provides additional information regarding tissue recovery and helps identify potential postoperative complications that may interfere with nutritional

rehabilitation. Documentation obtained during follow-up therefore complements the overall evaluation of the patient's postoperative progress. The serial appearance of the surgical wound during follow-up is presented in Figure 1



Figure 1. Serial Documentation of Surgical Wound Healing on Postoperative Days 13, 18, and 27

Figure 1 illustrates the gradual progression of wound healing across the scheduled follow-up visits, reflecting continuous tissue recovery after surgery. The absence of visible signs of wound infection or dehiscence is consistent with the patient's stable clinical condition documented during outpatient evaluation. These visual findings strengthen the interpretation that postoperative recovery progressed satisfactorily alongside the nutritional intervention provided. Accordingly, the documentation shown in Figure 1 complements the objective clinical and nutritional outcomes by providing direct evidence of favorable wound healing throughout the recovery period.

Discussion

Malnutrition remains one of the most important factors influencing postoperative outcomes among older adults with colorectal cancer because it contributes to impaired immune response, delayed wound healing, reduced muscle strength, and diminished tolerance to subsequent oncological therapy. In the present *case report*, severe malnutrition identified after anterior colon resection required immediate and individualized nutritional management to prevent further functional deterioration and to facilitate recovery. The gradual improvement in nutritional intake observed throughout hospitalization indicates that structured nutritional intervention can support metabolic adaptation during the postoperative period while minimizing complications associated with inadequate nutritional support. This finding is consistent with recent evidence demonstrating that individualized nutritional therapy constitutes an essential component of comprehensive cancer care because it improves nutritional status, enhances physiological recovery, and increases patients' readiness to continue definitive treatment (Wang & Pan, 2025; Jia et al., 2026).

One of the principal findings of this *case report* was the progressive increase in *handgrip strength* during hospitalization and outpatient follow-up. Improvement in muscle strength reflects not only better nutritional intake but also gradual restoration of physical function, which is particularly important in older adults experiencing postoperative physiological stress. Recent studies have shown that *handgrip strength* represents a simple, objective, and clinically meaningful indicator for evaluating functional status, muscle

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performance, and prognosis in patients with malignancy. Furthermore, implementation of *handgrip exercise* has been reported to improve muscle strength among older adults, supporting the usefulness of serial *handgrip strength* assessment as part of routine functional monitoring during nutritional rehabilitation (Putri et al., 2025; Orell et al., 2026). Therefore, the improvement observed in the present patient may indicate a favorable response to the combined effects of individualized nutritional therapy and postoperative recovery.

The favorable clinical course observed in this patient was also reflected by the absence of major postoperative complications, progressive reduction in drain output, and satisfactory wound healing. Adequate nutritional intake following surgery plays a critical role in supporting collagen synthesis, immune function, and tissue regeneration, thereby accelerating the wound repair process. In addition to nutritional therapy, early postoperative mobilization and comprehensive postoperative care contribute synergistically to improving functional recovery and reducing the risk of prolonged hospitalization. Previous studies have similarly reported that adequate nutritional support combined with appropriate postoperative management is associated with improved wound healing and better recovery among surgical patients (Efendi et al., 2025; Saragih, 2023). These observations suggest that nutritional intervention should be integrated with other supportive strategies to optimize postoperative outcomes in elderly patients with colorectal cancer.

The present findings also highlight the importance of comprehensive nutritional assessment throughout the continuum of cancer treatment. Patients with malignancy frequently experience complex metabolic alterations caused by inflammation, reduced dietary intake, treatment-related adverse effects, and increased energy expenditure, making continuous nutritional monitoring essential for maintaining clinical stability. Reports describing standardized nutritional care in patients with postoperative malignancies have emphasized that individualized nutritional assessment facilitates more appropriate intervention according to each patient's evolving clinical condition (Ummunnisa et al., 2025). Likewise, *case reports* involving patients with severe malnutrition undergoing cancer therapy have demonstrated that sustained nutritional support, including *home enteral nutrition* when indicated, contributes to maintaining nutritional status and improving tolerance to subsequent oncological treatment (Walter et al., 2026). Collectively, these findings support the multidisciplinary nutritional approach implemented in the present *case report*, particularly during the transition from inpatient care to outpatient follow-up.

The improvement in the patient's functional condition observed during follow-up further emphasizes that successful nutritional rehabilitation should be evaluated not only through anthropometric indicators but also through functional performance. Although body weight increased gradually, the serial improvement in *handgrip strength* provided additional evidence that muscle function recovered alongside nutritional repletion. Functional assessment is increasingly recognized as an important predictor of clinical outcomes because it reflects the patient's physiological reserve and ability to tolerate ongoing cancer treatment. Previous studies have shown that functional status is closely associated with prognosis among older adults with serious illnesses, indicating that routine evaluation of functional performance should complement nutritional assessment in geriatric oncology practice (Mihartari & Purnami, 2025; Orell et al., 2026). Consequently, combining nutritional monitoring with objective functional assessment may provide a more comprehensive evaluation of recovery than relying solely on anthropometric measurements.

Another important aspect highlighted by this *case report* is the need for multidisciplinary management throughout the perioperative period. Nutritional intervention alone may not be sufficient unless integrated with appropriate medical treatment, rehabilitation, pain control, and continuous patient education. Effective postoperative pain management facilitates early mobilization, improves dietary intake, and enhances patient participation in rehabilitation activities, thereby indirectly contributing to nutritional recovery and functional improvement (Efendi et al., 2025). Furthermore, recent evidence synthesis has recommended that perioperative intestinal rehabilitation should combine nutritional optimization, gradual restoration of gastrointestinal function, and individualized supportive care to achieve better postoperative outcomes in patients with colorectal cancer (Jia et al., 2026). These principles are consistent with the comprehensive management strategy implemented in the present patient.

Older adults undergoing cancer treatment frequently present with multiple geriatric syndromes that may complicate postoperative recovery and reduce tolerance to chemotherapy. Frailty, impaired nutritional status, functional decline, and reduced physiological reserve often coexist, making individualized treatment planning essential. Previous investigations have demonstrated a considerable prevalence of geriatric syndromes among elderly patients receiving chemotherapy, reinforcing the importance of comprehensive geriatric assessment before and after cancer treatment (Rizka et al., 2022). Likewise, systematic evidence indicates that adequate nutritional status contributes positively to health-related quality of life among older adults, further supporting the integration of nutritional intervention into comprehensive geriatric oncology care (Yusri & Bumi, 2023). Therefore, continuous nutritional assessment and individualized intervention should remain integral components of postoperative management to optimize both clinical and functional outcomes.

The principal novelty of this *case report* lies in the integration of individualized nutritional intervention with serial monitoring of *handgrip strength* as an objective indicator of functional recovery following anterior colon resection in an older adult with rectosigmoid malignancy and severe malnutrition. Unlike many reports that primarily describe improvements in nutritional intake or body weight, the present report demonstrates that functional recovery can also be documented through progressive changes in muscle strength during hospitalization and outpatient follow-up. This approach provides practical clinical evidence supporting the incorporation of objective functional assessment into routine nutritional management for geriatric patients undergoing colorectal cancer surgery. Nevertheless, because this study represents a single *case report*, further prospective studies involving larger patient populations are required to validate the effectiveness of individualized nutritional rehabilitation and to determine the long-term value of *handgrip strength* as a functional outcome measure in geriatric colorectal cancer care.

CONCULIONS

This case report demonstrates that individualized nutritional intervention implemented during the postoperative period was associated with the maintenance of nutritional status and improvement of functional capacity in an older adult with rectosigmoid adenocarcinoma and severe malnutrition. Serial monitoring of handgrip strength provided an objective description of functional recovery throughout hospitalization and follow-up. The patient's clinical course remained stable without evidence of postoperative complications or refeeding syndrome during the observation period. These findings highlight the feasibility of carefully monitored nutritional rehabilitation in high-risk geriatric oncology patients.

The clinical experience presented in this report emphasizes the value of integrating early nutritional assessment, individualized nutritional management, and objective functional monitoring into comprehensive postoperative care for older adults with colorectal cancer. This integrated approach may support recovery and facilitate readiness for subsequent oncological treatment. Although the observations are limited to a single patient, they provide practical clinical evidence that complements the existing literature on nutritional care in geriatric oncology. Further studies involving larger patient populations are needed to confirm the effectiveness of individualized nutritional intervention on nutritional and functional outcomes after colorectal cancer surgery.

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