Journal of Radiotherapy in Practice

Journal of Radiotherapy in Practice (2011)
10, 181–189

doi:10.1017/S1460396910000257

Original Article

Increasing nutritional support for patients undergoing radiation therapy: the radiation therapist perspective

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Abstract

Purpose: The aim of this study was to determine radiation therapists' knowledge on the nutritional management of side effects for patients receiving treatment to the gastrointestinal tract and genitourinary system and to determine the willingness of radiation therapists' to participate in nutritional training.

Method: A cross-sectional survey at a Radiation Oncology Treatment Centre was performed coupled with a semi-structured interview to explore radiation therapists' knowledge and experiences related to patient nutritional care.

Results: Eighty-one percent of participants agreed that they were often asked by patients for advice on eating. The majority of participants recognised that providing adequate nutrition support would be beneficial in terms of patient outcomes (91%) and ongoing patient compliance with nutrition advice (81%). However, participants demonstrated low confidence in providing nutrition support. Eighty-six percent of radiation therapists had not received any training on nutritional interventions and 100% of radiation therapists were interested in receiving more training.

Conclusion: This research indicates that radiations therapists are often asked for nutritional advice by patients and recognise the associated benefits but are not confident in providing advice. Our findings reveal an opportunity for radiation therapists to provide scripted nutrition advice to patients to reinforce recommendations made by dietitian.

Keywords

Radiation therapy; nutritional management; side effects; role expansion

INTRODUCTION

In 2005, according to the most recent report of the Australian Cancer Registries, malignancies of the upper gastrointestinal (GI) tract (2.7%), lower GI tract (5.7%) and genitourinary (GU) system (36.8%) accounted for 45.2% of all cancers diagnosed in Australia.[1] Patients undergoing radiation therapy (RT) to the upper and lower GI tract and GU system often experience side effects from unintended and unavoidable radiation damage to healthy non-malignant tissue surrounding the tumour. Side effects

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include; xerostomia (mouth dryness from decreased production of saliva),[2] dysgeusia (taste change),[3] dysphagia (swallowing problems),[4] mucositis (inflammation of mucous membranes lining the GI tract),[5] nausea, vomiting, diarrhoea and constipation.[6] These side effects reduce a patient's ability to ingest and absorb nutrients which can contribute directly to malnutrition and unintended weight loss.[7]

Malnutrition is associated with a reduced quality of life, poorer response to treatment, a longer mean stay in hospital and an increased risk of complications and infections, which will likely adversely affect patient outcomes.[7–9] It has been estimated that 20% of people with cancer die from the effects of malnutrition rather than the malignancy, and malnutrition and the associated weight loss as a result of malnutrition can often be prevented with adequate nutrition intervention.[10]

The Dietitians Association of Australia's Evidence Based guidelines for the Nutritional Management of Patients Receiving Radiation Therapy recommend the use of regular nutrition intervention in the form of dietary counselling to reduce patient weight loss and improve protein and energy intake and therefore nutritional status.[11]

Nutritional status reflects how well the nutrients consumed are meeting the body's nutritional requirements and is primarily determined by laboratory data.[12] Primary contributors to maintaining an adequate nutritional status are protein (for the growth, repair and maintenance of body tissue) and energy which is supplied by the diet as fat, protein, and carbohydrate. Weight loss is often used as a non-invasive method to identify patients at risk of poor nutritional status.[12]

Ravasco et al.[13] demonstrated in a randomised control trial for colorectal cancer patients undergoing RT that those patients who received dietary counselling had a higher intake of protein and energy and higher quality of life function scores than those who did not receive nutrition intervention.[3] These results are in accordance with the outcomes of a prospective study by Dawson et al.[14] where patients receiving RT for oral cancer and who were supported by increased frequency of dietary supervision experienced lower amounts of weight loss.[14]

However, there is a general lack of studies which have investigated the effects of nutritional support on the side effects which often result from RT to the upper and lower GI tract and GU system. In the aforementioned study by Ravasco et al.[13] 90% of patients who received dietary counselling also experienced improvements in relation to anorexia (loss of appetite), nausea, xerostomia, and dysgeusia, compared with only 51% of patients in the control group.[13]

The goal of dietary care in the oncology setting is to improve dietary intake and maintain physical functioning and quality of life.[11] Dietitians working in the oncology setting are the health professionals with the knowledge and skills to assess patients' nutritional needs, implement individualised nutrition care plans and provide ongoing support and monitoring. As part of this role, dieticians develop patient focused strategies to nutritionally manage oncology treatment related side effects, and provide written advice to patients. This nutritional advice is evidence based and could be used by other health professionals as a form of scripted nutrition advice. This would ensure that the information that patients are receiving and complying with is not in conflict with the information that might be provided to patients from non-nutrition experts. Any nutritional needs beyond the scripted nutrition advice would require referral to the dietician. Within RT there is scope to provide this scripted advice to radiation therapists so that they may on a day-to-day basis support the ongoing needs of RT patients.

Radiation therapists are the primary care providers of patients receiving daily radiation treatment, with most patients having daily treatment over a period of 4 to 7 weeks. Radiation therapists and patients form close relationships over the many weeks of treatment[15] and the radiation therapist–patient relationship allows radiation therapists a unique insight into patient

https://doi.org/10.1017/S1460396910000257 Published online by Cambridge University Press

treatment symptoms, side effects and eating behaviours, which is not as accessible to other health professionals on a day-to-day or week-to-week basis. It is proposed that this close contact with patients places radiation therapists in a unique position to recognise compliance with nutritional advice, as well as detect visible changes in nutritional status, such as unintentional weight loss.

While literature searches on the Cochrane, Cinhal, Medline and Embase data bases uncovered research looking at the link between nutritional support and better cancer outcomes, no research was found looking at the role of radiation therapists in providing nutrition support for patients with RT-related side effects. As such this research represents new research.

This project had two broad aims which were to

1. Determine radiation therapists' current knowledge associated with the nutritional management of RT-related side effects for patients receiving RT to the upper and lower GI tract and GU system.
2. To determine the willingness of radiation therapists' to participate in further training to help recognise nutrition-related side effects and when referrals to dietitians should be made.

METHOD

A cross-sectional survey of radiation therapists working at a large Radiation Oncology Treatment Centre (ROTC) in NSW, Australia was undertaken. The RT centre is a typical Australian RT workplace in terms of the comprehensiveness of simulation planning and treatment equipment; the numbers and types of patients treated; the numbers of and distribution of workload between therapists, oncologists, oncology nurses and medical physics staff; the availability of other cancer support staff within the cancer department and hospital, such as dietitians, physiotherapists, occupational therapists etc; and the community it provides oncology services to. Approval for this research was provided by the Hunter New England Human Research Ethics Committee (HNEREC).

No survey instruments were found in the literature that could be used to explore radiation therapists about their knowledge and experience with nutritional support for cancer patients; therefore a purposeful designed questionnaire, coupled with a semi-structured interview was developed by the authors. One of the authors was an Accredited Practicing Dietitian, one was a student undertaking the Nutrition and Dietetics program at the University, and two of the researchers were Radiation Therapists. The radiation therapy researchers were well known to staff of the RTOC; therefore, to minimise any effects of coercion on recruitment into the study, the student dietician researcher undertook all aspects of the research involving contact with staff of the RTOC.

All radiation therapists employed at the ROTC ($n = 50$ FTE) were invited by internal staff e-mail to attend a continuing professional development (CPD) presentation on the topic of the research during a routine staff development session. On completion of the presentation, conducted by the student dietician researcher, all staff attending the presentation received an information sheet describing the research and an invitation to participate in the study. To participate in the research, radiation therapists were required to return a consent form to a box placed within the department. Radiation therapists were given 2 weeks to consent to participate. Staff nominating to participate attended a private session with the dietician researcher and staff completed both the questionnaire and semi-structured survey. Approval was provided by the Chief Radiation Therapists for the individual sessions to be conducted during work time.

The questionnaire incorporated a series of closed ended questions that asked radiation therapists about their experiences with patients requiring nutritional care. The questions reviewed issues such as whether they were asked by patients for nutritional advice and whether they were confident in providing

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advice. These questions were analysed using typical closed ended response descriptive statics.

The semi-structured interview consisted of open-ended questions that allowed for greater exploration of radiation therapists' knowledge and experiences. The semi-structured interview questions asked radiation therapists to consider how they would make judgements about and whether they would recognise a patients poor nutritional status as well as discussing any training they may have received with regard to nutritional support for cancer patients. Two sets of analysis were performed on the open ended questions. Those questions assessing therapists knowledge were assessed in terms of the percentage of correct and incorrect answers, with the answers evaluated in terms of good knowledge ($\geq$ 50% correct answers) and poor knowledge (<50% correct answers). Responses arising from the professional experience questions were thematically analysed and grouped into common themes by the researchers using the descriptive words provided by the radiation therapists in their responses.

The CPD session undertaken at the centre, and the questionnaires and interviews conducted at the ROTC, were all undertaken by the student dietitian researcher who did not know any of the therapists at the centre. Only the academic dietitian researcher knew the identity of the participants and all data recorded was only assessable by that dietitian researcher.

RESULTS

A total of 35 radiation therapists attended the information session and therefore were eligible to participate in the research, with 21 radiation therapists agreeing to complete the questionnaire and participate in the semi-structured interview (60% response rate). The years of experience of the participant radiation therapists appear typical for a large department, with 67% of the participants having 6 years or greater clinical experience (Figure 1).

Radiation Therapists indicated that patients regularly asked them for advice on nutrition (71%), eating (81%) and bowel habits (76%) (Table 1).

Participants believed that providing nutrition support to patients would improve patient outcomes (91%) and patient compliance with nutrition advice (81%) provided by a dietitian. Radiation therapists indicated that being able

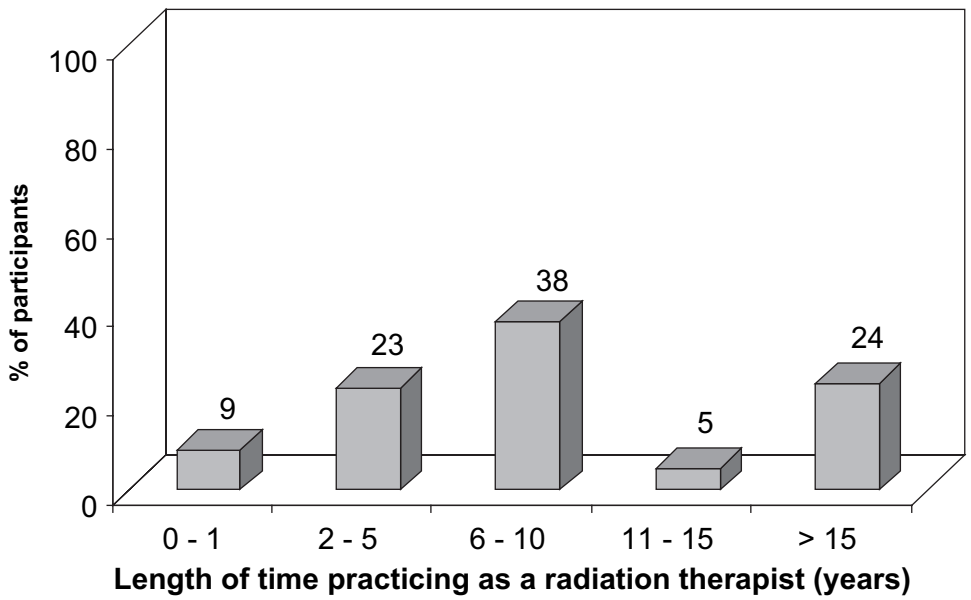

Figure 1. Participants experience as a radiation therapist, displayed by percentage.

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Table 1. *Radiation therapists reported frequency of patient requests for nutrition advice, displayed by percentage*

Questions Relating to Requests for Nutrition Advice	Yes
Do patients often ask you for advice on nutrition during their treatment?	71% ($n = 15$)
Do patients often ask you for advice on eating during their treatment?	81% ($n = 17$)
Do patients often ask you for advice on their bowel habits during their treatment?	76% ($n = 16$)

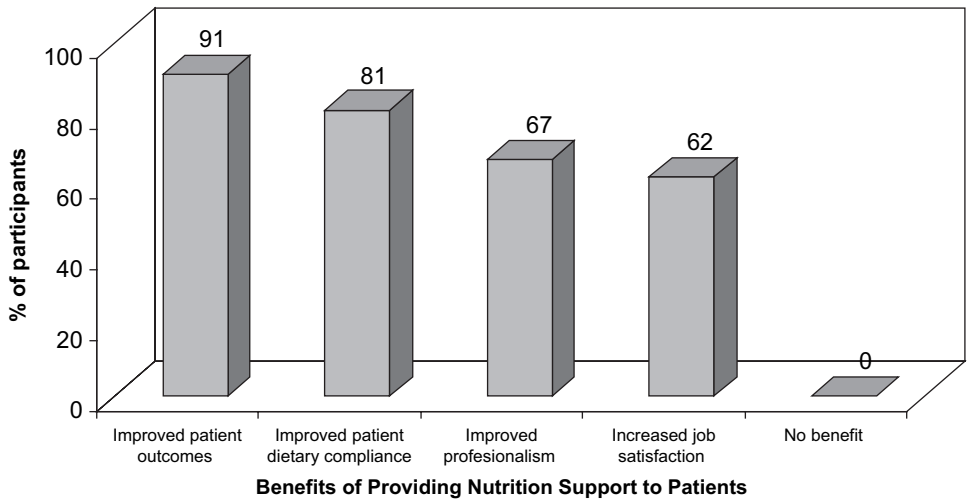

Figure 2. Radiation therapists perceived benefits of providing nutrition support to patients, displayed by percentage.

Table 2. *Radiation therapist's confidence in recognising indicators of poor nutrition, displayed by percentage*

Questions relating to confidence in recognising indicators of poor nutrition	No
Are you confident in your ability to recognise malnutrition in patients?	71.4% ($n = 15$)
Do you feel confident in your ability to recognise signs and symptoms of a patient at risk of malnutrition?	61.9% ($n = 13$)

to better support patients would provide increased professionalism (67%) and increased job satisfaction (62%) (Figure 2).

Although indicating that they recognise the importance of nutritional support and are frequently asked about nutritional issues, radiation therapists indicated that they were not confident to recognise important indicators of poor nutrition (Table 2).

Radiation therapists demonstrated poor knowledge (<50% correct answers) when asked to identify the correct nutritional advice to give to patients experiencing the eight most common side effects of RT (Figure 3). Only two radiation therapists demonstrated ≥50% correct answers when questioned on the possible nutritional consequences of diarrhoea, and no therapists demonstrated ≥50% correct answers when asked about the possible nutritional consequences of constipation, nausea, xerostomia, mucositis, dysgeusia or dysphagia (Figure 4).

Regardless of the site assessed (upper and lower GI tract, GU system), radiation therapists demonstrated <50% correct answers when asked to identify the signs and symptoms that may impact on the nutritional health of patients (Figure 5).

In terms of whether the radiation therapists had received any training on nutritional interventions for RT side effects 85.7% ($n = 18$)

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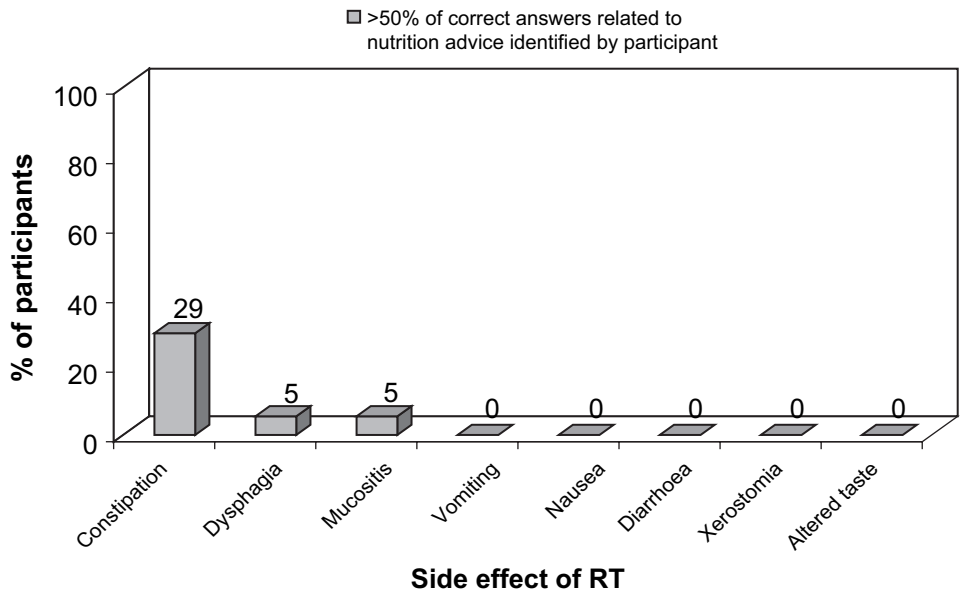

Figure 3. Radiation therapists level of knowledge on nutritional advice to provide patients with side effects of RT.

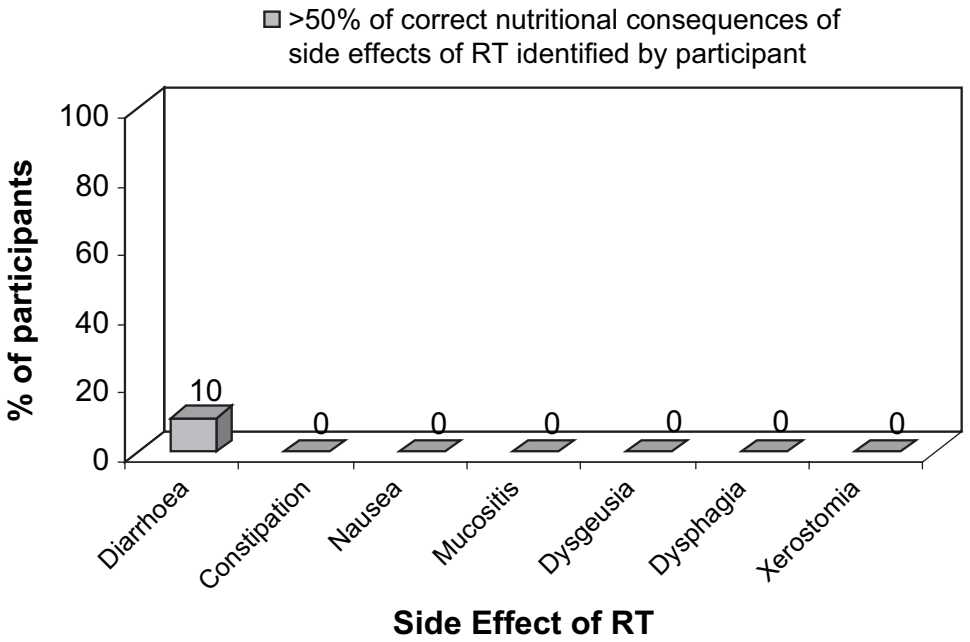

Figure 4. Radiation therapist's knowledge of the nutritional consequences of some of RT related side effects.

indicated that they had not. When asked whether they were interested in receiving support to assist the identification of side effects that would lead to a dietitian's referral 100% ($n = 21$) indicated yes they were interested.

DISCUSSION

The purpose of this study was to investigate the role of radiation therapists in providing nutrition support to patients by investigating radiation therapists' knowledge on the

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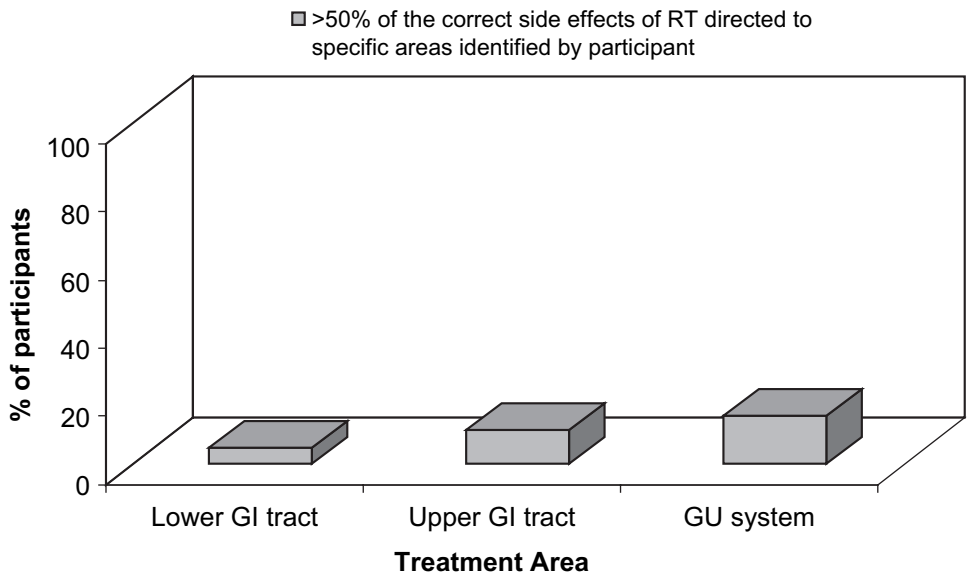

Figure 5. Participants level of knowledge of side effects of treatment to the lower GI, upper GI and GU system that may impact the nutritional health of patients.

nutritional management of the side effects of RT to the upper and lower GI tract and GU system and by exploring their willingness to participate in nutritional training. The main findings of this study were that radiation therapists are often asked for nutritional advice by patients and recognise the benefits of giving nutritional advice to patients but are not confident in providing nutritional advice and currently do not have the expertise to provide correct advice.

Halket and Kristjason[16] found patients form relationships with radiation therapists and felt comfortable asking questions. These findings support the suggestion that radiation therapists are in an ideal position to provide intermediary and scripted nutritional advice to patients as an adjunct to the nutritional management of the patient by the dietitian.

A study by Long[17] found patients who received conflicting advice by health professionals became confused and lost confidence in their health-care team, while a study by Gamble[18] found patients undergoing RT often seek information from health professionals on the side effects of treatment and receiving inaccurate or inadequate information increased levels of anxiety.[18] The provision of scripted nutritional advice sustained by ongoing support by radiation therapists is one way to reduce the effects conflicting nutritional advice being given to patients.

It is not anticipated that radiation therapists replace the role of dietitians, rather the scripted nutritional advice and the strong relationship with the dietician would aid in the nutritional care of patients, thus improving patient outcomes. It is important that radiation therapists liaise with dietitians to ensure consistent evidence based advice is provided to patients to encourage compliance with nutritional prescriptions.

The findings of this research indicate radiation therapists receive minimal training related to nutrition interventions for RT-related side effects and that a dietitian-led training and support program for radiation therapists would be beneficial. Furthermore, this study found radiation therapists are interested in receiving nutrition-related training.

A limitation of this study is that only radiation therapists from one ROTC were surveyed; however, the research has enabled

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insight on the perspectives of radiation therapists at a typical Australian ROTC.

CONCLUSION

This research provides evidence that radiation therapists are in an ideal position to identify patients who require dietetic referral, and to provide intermediate nutritional support to these patients through scripted nutritional advice. Radiation therapists recognise the benefits of an increased knowledge of nutritional management of RT-related side effects and the impact this could have on patient care. However, radiation therapists currently do not have the confidence or expertise to provide adequate nutrition support. This could be addressed by ongoing professional development training in nutrition and RT side effects, an increased focus on nutrition in undergraduate degree programs or specialist post-graduate programs.

This paper focuses only on the role of the radiation therapist in providing ongoing support to patients. Since the completion of this research, further research has been planned and begun, including; a systematic review of the evidence for nutritional management of radiation therapy side effects, and two national surveys to dietitians and radiation therapists exploring the concept of dieticians providing scripted nutritional advice to oncology staff in an attempt to better support patients (grant-funded research); exploring the barriers to compliance for radiation therapy patients provided with scripted nutritional advice (research higher degree student); the development and implementation of a work based training package process which will allow radiation therapists to monitor patient's compliance with nutritional advice; and a prospective study to evaluate the impact of the compliance intervention on patients.

ACKNOWLEDGEMENTS

The authors would like to thank the radiation therapists who participated in this research.

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