Psychological functioning in cancer patients treated with radiotherapy

Box 4: How Anne experienced her treatment with radiotherapy

Anne: I began radiation treatment about one month after surgery, after the scar had healed. For six weeks, I went to the hospital each day. I was extremely tired and I spent many days lying on the sofa. I had no strength even to go to the front door. I became completely dependent. Sleep was my friend and my insides were irritated. They talk about how strong the radiation beams are, and I can say now, it’s true, they are. Around the last week of radiotherapy, I felt that I had touched the bottom of a void. I was in a deep depression, and there was nothing I could do to help myself get out of it. And I recognized the depression but I couldn’t help it. I think it was then that things became to change again. I remember thinking of my children, Liza who was in high school and Susan who was studying at the university for almost one year now. I thought about them, I thought about everything, and I knew things could not go on like this. I did not want my children to see me like this anymore, so I tried to go on. My husband Peter and both my daughters were there for me, and I knew I had to live, not only for them, but for myself as well. Because there were so many things I still wanted to do such as traveling and spending time with my family. Slowly, I regained my strength, but it was hard. Of course, I still had my ups and downs, but I was able to see the light at the end of the tunnel.

Introduction

Radiotherapy (RT) is one of the earliest treatments for cancer and plays an important role in the care of cancer patients. Ever since the discovery of x-rays by Roentgen in 1895, the therapeutic delivery of large doses of radiation has been used in the
attempt to eradicate tumors (McCarty & Million, 1984). However, inadequate equipment and an inability to deliver safe doses of radiation to the tumor without damaging normal tissue impeded early use of radiation. In the 1940s, modern RT was initiated and a new procedure was developed which had the ability to be ‘skin sparing’ and to limit the morbidity to other normal structures (Brady & Davis, 1988).

Radiotherapy is one of the most effective means by which local/ regional control of cancer is obtained. Cancer patients may receive radiotherapy as their primary treatment but it can also be given as adjuvant treatment alone after surgery or along with chemotherapy. About 45% of patients with malignancy require radiotherapy. Approximately 50% of these patients is treated with the intention to cure, whereas the other 50% is treated palliatively.

The intention of curative radiotherapy is to target the cancer cells to arrange local control. The treatment field of radiotherapy typically includes the tumor site and if indicated the lymph nodes that drain the area. Unfortunately, there are also normal cells which are very close to the cancer cells. Because it is not possible to exclude normal cells from the treatment field, radiation also affects normal tissue, which can cause a number of side effects. Common side effects can include fatigue, skin irritation at the site of the radiation beams, nausea, diarrhea, and gastrointestinal symptoms. These side effects may persist till several weeks after treatment and then will disappear for most patients (Caffo et al., 1996; Fransson & Widmark, 1999; Graydon, 1994; King et al., 1985; Nail et al., 1986; Walker et al., 1996).

Radiotherapy is usually delivered in a series of treatments over a period of two to eight weeks on a daily basis (Monday- through- Friday schedule). During the treatment, patients are placed on the treatment couch of the linear accelerator and are not able to see, hear, smell, or feel what is happening. Outlines have been drawn on their skin to indicate the exact place on the body where the beams are entering the body (simulation). During treatment with radiotherapy, a radiation technologist gives orders by using a microphone behind a glass door. It is very important that the patient is well informed about what to expect during the treatment period, but it is also important to explain the aim of radiotherapy (Dreifuss-Katan, 1990).

Studies have shown that cancer patients may also face psychological problems when they are treated with RT (Forester et al., 1978; Peck & Boland, 1977). Since the late 1970s, the number of studies focusing on psychological responses to RT has grown rapidly. These studies measured a wide range of aspects of psychological functioning, including depression, anxiety, negative and positive mood, and psychological well-being or distress. However, the field lacks a systematic overview of the empirical data regarding psychological functioning prior to, during, and after RT.

This review was written to gain a better insight into the psychological functioning of patients treated with RT. We divided the research question into two
First, we wanted to provide an overview of psychological functioning in adult cancer patients who have been treated with external RT. We summarized the aforementioned aspects of psychological functioning into three categories, i.e.: (1) feelings of anxiety, (2) depressive symptoms, and (3) psychological distress. In the section ‘psychological distress’ we adopted the terminology of the original authors which covers various aspects such as negative and positive mood, psychological well-being or distress. Second, we were interested in determining whether medical factors are associated with psychological functioning of patients treated with RT: (a) we assessed differences in psychological functioning among patients treated with RT compared to other treatment modalities. By making these comparisons, an indication of the impact of RT on psychological functioning may be provided; and (b) we examined other medical factors as for instance, stage of disease and cancer site.

Methods

A literature search using Medline and Psychlit databases over the period 1980 - 2002 identified 454 and 26 references, respectively (total 480). Separate searches were performed using radiotherapy with or without psychology or neoplasms as key-terms in combination with adaptation psychological/psychological, emotions/emotional adjustment, behavioral symptoms/sciences, anxiety disorders and quality of life. Papers were selected at first on the basis of the abstracts. Studies had to include patients who had been treated with external RT, regardless of their cancer site, kind of treatment (curative or palliative) and other adjuvant treatment(s). Since the scope of this review is limited to studies that assessed psychological functioning in relation to RT, studies on the evaluation of this treatment on fatigue, metabolic, sexual and reproductive capabilities and skin integrity were excluded. Furthermore, case studies, commentaries on articles, and letters were also excluded. This led to an identification of 68 eligible studies. References appearing in these 68 studies were inspected to identify additional 8 eligible studies. Finally, intervention studies, studies about information needs and receiving information related to RT, as well as studies not specifying fixed assessment points or not pointing out which aspects of psychological functioning were measured, were also excluded. As a result of this procedure we retained 45 studies (See Tables 1-4).

The studies include in this review fall into several distinct categories. Twenty-two studies had a cross-sectional design (i.e., only one assessment). These included: (a) one study prior to RT, (b) four studies during RT and, (c) 17 studies after RT. We included 23 longitudinal studies. Thirteen of these longitudinal studies had assessment points prior to and after RT, assessed psychological functioning during and after RT, or measured psychological functioning at different points during or
after RT. These studies were subdivided into prior to, during and after RT sections. Given the variety with respect to assessment points of these longitudinal studies, there is an overlap in that some studies are discussed in more than one section (see Table 1-3). In sum, this led to five studies prior to (see Table 1), 11 studies during (see Table 2), and 28 studies after RT (see Table 3). The remaining ten longitudinal studies examined psychological functioning prior to RT, as well during and after RT. These studies were expected to show the dynamics of psychological functioning over time and were categorized as longitudinal studies measuring psychological functioning (see Table 4).

Results

Psychological functioning prior to RT

Feelings of Anxiety. The three studies that focused on anxiety prior to RT, used the Hospitality Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983) to measure feelings of anxiety and depression (Maher et al., 1996; Maraste et al., 1992; Wallace et al., 1993). The results revealed that 10%-20% of the patients reported feelings of anxiety prior to receiving RT.

Depressive Symptoms. Depressive symptoms as measured by the HADS seemed rather low in patients before they attended RT, ranging from 1.5% to 8% of the patients reporting depressive symptoms (Maraste et al., 1992; Maher et al., 1996; Wallace et al., 1993). Using the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977) in a group of laryngeal patients, De Graeff et al. (1999) showed that none of the 65 patients had a score above the used cut-off score of 16. This indicates that none of the patients could be classified as having depressive symptomatology.

In summary, about 10-20% of the patients prior to RT, seem to experience feelings of anxiety. These results indicate that at the start of a course of radiotherapy, psychological distress is characterized by feelings of anxiety rather than by depressive symptoms (see Table 1).
Table 1. Overview of studies examining psychological functioning prior to RT

<table>
<thead>
<tr>
<th>Reference</th>
<th>Sample size(^a)</th>
<th>Cancer site</th>
<th>Stage(^b)</th>
<th>Adjuvant treatment</th>
<th>Moment of measurement</th>
<th>Instruments(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>De Graeff'99</td>
<td>N= 65</td>
<td>head and neck</td>
<td>curative</td>
<td>unknown</td>
<td>prior to RT</td>
<td>EORTC QLQ-C30+3; CES-D</td>
</tr>
<tr>
<td></td>
<td>N= 47 RT</td>
<td>breast</td>
<td>stage I (no RT group)</td>
<td>chemotherapy for some</td>
<td>prior to RT</td>
<td>observer rating scale to measure aspects of psychosocial morbidity; Leeds scales</td>
</tr>
<tr>
<td></td>
<td>N= 38 only mastectomy</td>
<td></td>
<td>stage II (RT)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Hughson'87</td>
<td></td>
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</tr>
<tr>
<td>Maraste'92</td>
<td>N= 269</td>
<td>&gt; 3</td>
<td>173 cure or long-term control, 96 palliative</td>
<td>unknown</td>
<td>prior to RT</td>
<td>EORTC QLQ-C30; HADS</td>
</tr>
<tr>
<td>Wallace'93</td>
<td>N= 133</td>
<td>breast</td>
<td>unknown</td>
<td>unknown</td>
<td>prior to RT</td>
<td>HADS</td>
</tr>
<tr>
<td></td>
<td>N= 63</td>
<td>breast</td>
<td>early stage</td>
<td>tamoxifen</td>
<td>prior to RT</td>
<td>HADS; STAI</td>
</tr>
</tbody>
</table>

\(^a\) for some studies reference groups were also included in the table
\(^b\) some studies did not specify stage but did give an indication of curative, palliative or early stage disease, this information is included in the table
\(^c\) HADS= Hospital Anxiety and Depression Scale; STAI= State-Trait Anxiety Inventory; EORTC QLQ-C30= European Organization for Research and Treatment of Cancer Core Quality of Life Questionnaire; CES-D= Center for Epidemiologic Studies Depression Scale; SCL-90= Symptom Check List; POMS= Profile Of Mood States; IDS-SR= Inventory of Depressive Symptomatology-Self Report; PRIME-MD= Primary Care Evaluation of Mental Disorders; BDS= Beck Depression Scale; FACT-G= Functional Assessment of Cancer Therapy-General form; GHQ-20= General Health Questionnaire; PANAS= Positive And Negative Affect Schedule; BCQ= Breast Cancer Chemotherapy Questionnaire; MHI-5= Mental Health Index; SWBI= Subjective Well-Being Inventory; BDI= Beck’s Depression Inventor; Medical Outcomes Study Group Short Form health survey= SF-36
<table>
<thead>
<tr>
<th>Reference</th>
<th>Sample sizea</th>
<th>Cancer site</th>
<th>Stageb</th>
<th>Adjuvant treatment</th>
<th>Moment of measurement</th>
<th>Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>During treatment</td>
<td></td>
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</tr>
<tr>
<td>Irwin’86</td>
<td>N= 181</td>
<td>&gt; 3</td>
<td>curative</td>
<td>chemotherapy</td>
<td>1 week after start RT</td>
<td>SCL-90-R</td>
</tr>
<tr>
<td>Jenkins’98</td>
<td>N= 52</td>
<td>&gt; 3</td>
<td>15 palliative, 37 curative</td>
<td>unknown</td>
<td>during RT</td>
<td>IDS-SR</td>
</tr>
<tr>
<td>Klee’00</td>
<td>N= 118</td>
<td>cervical</td>
<td>unknown</td>
<td>during RT</td>
<td>3 days before the end of RT</td>
<td>EORTC QLQ-C30</td>
</tr>
<tr>
<td></td>
<td>N= 236 controls</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Lamszus’94c</td>
<td>N= 30 in-patients</td>
<td>&gt; 3</td>
<td>17 palliative, 13 curative</td>
<td>unknown</td>
<td>during RT</td>
<td>semi-standardised interview</td>
</tr>
<tr>
<td>Leopold’98</td>
<td>N= 122</td>
<td>&gt; 3</td>
<td>46 palliative, 31 recurrent or persistent stage I or II</td>
<td>unknown</td>
<td>during first week of RT</td>
<td>interview: PRIME-MD</td>
</tr>
<tr>
<td>Mose’01</td>
<td>N= 111</td>
<td>breast</td>
<td></td>
<td>chemotherapy 31</td>
<td>first and last day of RT</td>
<td>self-designed questionnaire</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>hormonal 77</td>
<td></td>
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Table continues.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Sample size</th>
<th>Cancer site</th>
<th>Stage</th>
<th>Adjuvant treatment</th>
<th>Moment of measurement</th>
<th>Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>During treatment</strong></td>
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</tr>
<tr>
<td>Munro’89</td>
<td>N = 80</td>
<td>&gt; 3</td>
<td>unknown</td>
<td>unknown</td>
<td>80 within 24 h of first RT</td>
<td>interview: patients had to rank 78 problems into piles and rank them in order of troublesome</td>
</tr>
<tr>
<td></td>
<td>N = 31</td>
<td></td>
<td></td>
<td></td>
<td>31 at the end of RT</td>
<td></td>
</tr>
<tr>
<td>Nail’86</td>
<td>N = 30</td>
<td>gynecological</td>
<td>cure or control</td>
<td>unknown</td>
<td>first, third and last weeks of RT</td>
<td>POMS</td>
</tr>
<tr>
<td>Oberst’91</td>
<td>N = 72</td>
<td>&gt; 3</td>
<td>unknown</td>
<td>unknown</td>
<td>during RT</td>
<td>POMS</td>
</tr>
<tr>
<td>Rahn’98</td>
<td>N = 53</td>
<td>breast</td>
<td>unknown</td>
<td>20 chemotherapy, 24 endocrine</td>
<td>first and last day of RT</td>
<td>2 self-designed questionnaires</td>
</tr>
<tr>
<td>Whelan’00</td>
<td>N = 416 RT</td>
<td>breast</td>
<td>curative</td>
<td>No</td>
<td>during RT</td>
<td>BCQ modified</td>
</tr>
<tr>
<td></td>
<td>N = 421 no further treatment</td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

*a for some studies reference groups were also included in the table,

*b some studies did not specify stage but did give an indication of curative, palliative or early stage disease, this information is included in the table,

*c though measuring also during follow-ups, this study revealed results for the period during RT only, and is therefore included only in the during treatment section
<table>
<thead>
<tr>
<th>Reference</th>
<th>Sample sizea</th>
<th>Cancer site</th>
<th>Stageb</th>
<th>Adjuvant treatment</th>
<th>Moment of measurement</th>
<th>Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bjordal'95</td>
<td>N= 204</td>
<td>head and neck</td>
<td>stage III, IV</td>
<td>unknown</td>
<td>7-11 years after RT</td>
<td>GHQ-20; EORTC QLQ-C30</td>
</tr>
<tr>
<td>Caffo'96</td>
<td>N= 70</td>
<td>prostate</td>
<td>unknown</td>
<td>no</td>
<td>follow-up of at least 6 months</td>
<td>self-designed questionnaire based on EORTC</td>
</tr>
<tr>
<td>Caffo'01</td>
<td>N= 98</td>
<td>testicular</td>
<td>I</td>
<td>no</td>
<td>123 months after RT</td>
<td>self-designed questionnaire</td>
</tr>
<tr>
<td>Carpenter'89</td>
<td>N= 15 RT within previous two years</td>
<td>Hodgkin's disease</td>
<td>I, II</td>
<td>no</td>
<td>+/- 4.7 years after RT</td>
<td>BDS; Structured interview: SCL-90</td>
</tr>
<tr>
<td>Carpenter'89</td>
<td>N= 28 more than 2 years before</td>
<td>Hodgkin's disease</td>
<td>I, II</td>
<td>no</td>
<td>123 months after RT</td>
<td>BDS; Structured interview: SCL-90</td>
</tr>
<tr>
<td>Chaturvedi'96</td>
<td>N= 100</td>
<td>&gt; 3</td>
<td>unknown</td>
<td>unknown</td>
<td>after finishing RT, at 3-4 months follow-up</td>
<td>HADS</td>
</tr>
<tr>
<td>De Graeff'99c</td>
<td>N= 44</td>
<td>bladder, prostate</td>
<td>unknown</td>
<td>unknown</td>
<td>6 months after RT</td>
<td>interview</td>
</tr>
<tr>
<td>Eardley'90</td>
<td>N= 44</td>
<td>bladder, prostate</td>
<td>unknown</td>
<td>unknown</td>
<td>2 months after RT</td>
<td>interview</td>
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</tbody>
</table>

Table continues.
Table 3. Continued.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Sample size</th>
<th>Cancer site</th>
<th>Stage</th>
<th>Adjuvant treatment</th>
<th>Moment of measurement</th>
<th>Instruments</th>
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</thead>
<tbody>
<tr>
<td><em>Post treatment</em></td>
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</tr>
<tr>
<td>Epstein’99</td>
<td>N= 65</td>
<td>head and neck</td>
<td>stage I, II, III, IV</td>
<td>unknown</td>
<td>+/- 8.6 months after RT</td>
<td>SF-36 health Survey</td>
</tr>
<tr>
<td>Fowler’96</td>
<td>N= 621 RT</td>
<td>prostate</td>
<td>unknown</td>
<td>unknown</td>
<td>3-5 years after RT</td>
<td>interview: POMS</td>
</tr>
<tr>
<td></td>
<td>N= 373 surgery</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Graydon’94</td>
<td>N= 53</td>
<td>breast</td>
<td>stage I, II</td>
<td>chemotherapy</td>
<td>+/- 7 weeks after RT</td>
<td>interview: POMS</td>
</tr>
<tr>
<td></td>
<td>N= 5</td>
<td></td>
<td></td>
<td>N=5</td>
<td></td>
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<tr>
<td>Hann ’98</td>
<td>N= 45</td>
<td>breast</td>
<td>stage 0, I, II, III</td>
<td>no</td>
<td>+/- 22 months after RT</td>
<td>SF-36 health Survey; STAI; CES-D</td>
</tr>
<tr>
<td></td>
<td>N= 44 controls</td>
<td></td>
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<tr>
<td>Hughson’87c</td>
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<tr>
<td>Irwin’86f</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Klee’00d</td>
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Table continues.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Sample size</th>
<th>Cancer site</th>
<th>Stage</th>
<th>Adjuvant treatment</th>
<th>Moment of measurement</th>
<th>Instruments</th>
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</thead>
<tbody>
<tr>
<td><strong>Post treatment</strong></td>
<td></td>
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</tr>
</tbody>
</table>
| Lasry’87       | N = 36 lumpectomy + RT  
N = 43 mastectomy  
N = 44 lumpectomy | breast      | unknown | chemotherapy for some | +/- 3.5 years after RT | CES-D        |
| Lim’95         | N = 60 RT  
N = 89 radical prostatectomy | prostate    | stage I, II, III | unknown | 0 - more than 18 months after RT | POMS        |
| Litwin’95      | N = 56 RT  
N = 98 prostatectomy  
N = 60 observation  
N = 273 controls | Prostate    | unknown | unknown | after treatment | RAND-36; FACT-G |
| Maher’96c      |             |             |       |                    | 1 month after RT       |              |

Table continues.
Table 3. Continued.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Sample size</th>
<th>Cancer site</th>
<th>Stage</th>
<th>Adjuvant treatment</th>
<th>Moment of measurement</th>
<th>Instruments</th>
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<tbody>
<tr>
<td>Post treatment</td>
<td></td>
<td></td>
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<tr>
<td>Morton’84</td>
<td>N= 19 RT</td>
<td>head and neck</td>
<td>stage I, II, III or IV</td>
<td>unknown</td>
<td>within 3 years after treatment</td>
<td>Geriatric Mental State Schedule</td>
</tr>
<tr>
<td>N= 12 surgery</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>N= 17 RT + surgery</td>
<td></td>
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<tr>
<td>Munro’89, Nail’86</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>at the end of treatment</td>
<td>monthly for 3 months following completion of RT</td>
</tr>
<tr>
<td>Padilla’90</td>
<td>N= 101</td>
<td>&gt; 3</td>
<td>unknown</td>
<td>unknown</td>
<td>at the end of RT or at first visit after completion of RT</td>
<td>Quality of life tool</td>
</tr>
<tr>
<td>Rathmell’91</td>
<td>N= 54 RT</td>
<td>head and neck</td>
<td>unknown</td>
<td>unknown</td>
<td>1.5 – 6.5 years after RT +/- 11.5 months after RT</td>
<td>questionnaire:QLQ interview: N=11 general mood; HADS SCL-90</td>
</tr>
<tr>
<td>N= 3 surgery</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N= 39 RT + surgery</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Schain’93</td>
<td>N= 76 RT</td>
<td>breast</td>
<td>early stage</td>
<td>chemotherapy</td>
<td>6, 12, 24 months after RT</td>
<td></td>
</tr>
<tr>
<td>N= 66 mastectomy</td>
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</tbody>
</table>

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<tr>
<td>Post treatment</td>
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<td></td>
</tr>
<tr>
<td>Taphoorn'94</td>
<td>N= 20 RT</td>
<td>low-grade gliomas</td>
<td>unknown</td>
<td>yes(^a)</td>
<td>12- 180 months after diagnosis</td>
<td>POMS</td>
</tr>
<tr>
<td></td>
<td>N= 21 surgery or biopsy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N= 19 control subjects with low-grade hematological malignancies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walker'96</td>
<td>N= 26</td>
<td>breast, prostate</td>
<td>stage I, II</td>
<td>hormonal therapy</td>
<td>+/- 20 months post-RT</td>
<td>PANAS</td>
</tr>
<tr>
<td>Wallace'93(^c)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whelan'00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) for some studies reference groups were also included in the table

\(^b\) some studies did not specify stage but did give an indication of curative, palliative or early stage disease, this information is included in the table

\(^c\) also depicted in Table 1

\(^d\) also depicted in Table 2

\(^e\) not specified
Table 4. Overview of studies examining longitudinal psychological functioning

<table>
<thead>
<tr>
<th>Reference</th>
<th>Sample size</th>
<th>Cancer site</th>
<th>Stage</th>
<th>Adjuvant treatment</th>
<th>Moment of measurement</th>
<th>Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andersen’85</td>
<td>N= 45</td>
<td>&gt; 3</td>
<td>survival estimates: 0-86%</td>
<td>unknown</td>
<td>one day before RT, every five days and the last week of RT, following last RT</td>
<td>STAI; POMS</td>
</tr>
<tr>
<td>Buick’00</td>
<td>N= 52 RT</td>
<td>breast</td>
<td>stage I, II, III, IV</td>
<td>see sample size</td>
<td>prior to RT, after either the 10th or 13th fraction, after the 18th or 23rd fraction, one and three months after RT</td>
<td>POMS; MHI</td>
</tr>
<tr>
<td></td>
<td>N= 26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>chemotherapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bye’95</td>
<td>N= 143</td>
<td>gynaecological</td>
<td>stage I, II</td>
<td>unknown</td>
<td>before RT, in the last week of RT, six weeks after end of RT and every eight weeks during one year’s follow up</td>
<td>EORTC QLQ–30+ 6</td>
</tr>
</tbody>
</table>

Table continues.
### Table 4. Continued

<table>
<thead>
<tr>
<th>Reference</th>
<th>Sample size(^a)</th>
<th>Cancer site</th>
<th>Stage(^b)</th>
<th>Adjuvant treatment</th>
<th>Moment of measurement</th>
<th>Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Longitudinal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chandra’98</td>
<td>N= 39 (three assessments) N= 31 (without three assessments)</td>
<td>&gt; 3</td>
<td>50% stage I or II and 50% advanced cancer</td>
<td>unknown</td>
<td>when newly diagnosed, prior to RT, one week after starting, at termination, three to four months after stopping RT</td>
<td>SWBI</td>
</tr>
<tr>
<td>Chawla’99</td>
<td>N= 50 N= 43 at third interview</td>
<td>head and neck</td>
<td>3 stage I</td>
<td>unknown</td>
<td>before RT, during 3-4 weeks of RT, 3 months after RT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 stage II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>27 stage III</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 stage IV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dow’00</td>
<td>N=23</td>
<td>breast</td>
<td>stage I and II</td>
<td>no</td>
<td>before RT, week 1,3, and week 5 during RT, 6 months after RT</td>
<td>BDI</td>
</tr>
<tr>
<td>Frischen schlager ’91</td>
<td>N= 87</td>
<td>&gt; 3</td>
<td>unknown</td>
<td>unknown</td>
<td>prior to RT, in the middle and at the end of RT and three months afterwards</td>
<td></td>
</tr>
</tbody>
</table>

Table continues.
**Table 4.** Continued

<table>
<thead>
<tr>
<th>Reference</th>
<th>Sample size(a)</th>
<th>Cancer site</th>
<th>Stage(b)</th>
<th>Adjuvant treatment</th>
<th>Moment of measurement</th>
<th>Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Janda'00</td>
<td>N= 41</td>
<td>prostate</td>
<td>T1-T3</td>
<td>no</td>
<td>prior to RT, 3 and 6 weeks after initial RT, 6 weeks and 5 months after completion RT</td>
<td>N= 21 EORTC QLQ-C30 N= 20 SF-36</td>
</tr>
<tr>
<td>Monga'99</td>
<td>N=36</td>
<td>prostate</td>
<td>T1-T2</td>
<td>no</td>
<td>prior to RT, middle of RT, at completion of RT, 4-5 weeks follow-up</td>
<td>BDI</td>
</tr>
<tr>
<td>Munro'96</td>
<td>N= 110</td>
<td>72 breast, 24 lung, 14 head and neck</td>
<td>stage I or II (breast)</td>
<td>unknown</td>
<td>prior to RT, several times during RT and after RT</td>
<td>34 problems were listed and patients had to select symptoms and quantified these with a LASA-type scale</td>
</tr>
</tbody>
</table>

\(a\) for some studies reference groups were also included in the table

\(b\) some studies did not specify stage but did give an indication of curative, palliative or early stage disease, this information is included in the table
Psychological functioning during RT

Feelings of Anxiety. In a qualitative study by Munro et al. (1989) patients were asked to report which problems associated with RT caused the most distress (N=110). Feelings of anxiety were among the ten most troublesome problems defined within 24 hours of following the first dose of RT (Munro et al., 1989). Interestingly, three studies asked patients about RT-related anxiety at the beginning and last day of treatment and all found a decrease in anxiety (Lamszus et al., 1994; Mose et al., 2001; Rahn et al., 1998). Specifically, Rahn et al. (1998) revealed that, at the first day of RT, 40% of the patients (N=53) felt anxious about undergoing RT and 54% were afraid of the treatment’s possible side effects (N=53). Feelings of anxiety decreased during the next sessions. That is, at the last day of treatment, 19% of the patients reported that they had felt anxious most of the time or during the whole treatment. Using a short, structured interview (Primary Care Evaluation of Mental Disorders) (Spitzer et al., 1994), only one study was able to make more formal DSM-IV diagnoses of anxiety and depression (Leopold et al., 1998). It was shown that, during the first week of RT, 21% of the 122 patients received a diagnosis with an anxiety disorder.

Depressive Symptoms. Leopold et al. (1998) found symptoms of depression to be a more potent distressor than feelings of anxiety during the first week of RT. About 12% of the patient group (N=122) received a major depression disorder and 29% were identified with a minor depression disorder (Leopold et al., 1998). Three studies also revealed that a substantial number of patients reported depressive symptoms during RT (i.e., ranging from 31% to 33%) (Irwin et al., 1986; Jenkins et al., 2000). In addition, one qualitative study showed that depressive symptoms were mentioned as one of the problems experienced by patients after starting RT (N=110) (Munro & Potter, 1996).

Psychological Distress. Nail et al. (1986) revealed that the level of negative mood, as measured by the Profile Of Mood Status (POMS) (McNair et al., 1971), peaked during the last week of RT, when subjects were experiencing a relatively high level of severe side effects. In contrast to Nail et al. (1986), a study of Oberst et al. (1991) found no peak of negative mood during treatment and, as a group, the patients (N=72) reported little affective mood disturbance during treatment. One problem with the Oberst et al. study is that they did not specify the moment of measurement, thus complicating the examination of differences among studies. Finally, Rahn et al. (1998) found that, at the last day of treatment, 38% of the women in the study reported emotional distress induced by receiving RT.

In sum, feelings of anxiety seem substantial at the time of the first treatment, ranging from 21% to 54%. However these feelings of anxiety seem to decline during the course of treatment. Furthermore, as Lamszus et al. (1994) and Rahn et al. (1998) posed, it may be that general levels of anxiety are generated by specific levels of RT-related anxiety. Interestingly, compared to depressive symptoms prior
to RT, depressive symptoms during RT were relatively high, ranging from 12% to 31%. Another study found negative mood to be relatively low during treatment (Nail et al., 1986). There are several discrepancies among the studies discussed above which may be associated with the different forms of assessment used by the authors. For example, Nail et al. (1986) indicated that the low levels of negative mood found in his patient group could be the result of using self-reports rather than psychiatric interviews. Another possibility raised by this author could be that patients with advanced disease were excluded from her study, which could explain the lower levels of negative mood (see Table 2).

Psychological functioning after RT

Feelings of Anxiety. At the end of treatment or at the first follow-up, Padilla (1990) found that few patients reported feelings of anxiety. Other studies showed a decrease in feelings of anxiety after RT (Irwin et al., 1986; Wallace et al., 1993). For instance, Wallace et al. (1993) found that 17.5% of the patients reported feelings of anxiety prior to treatment compared to 6% of the patients after RT. In contrast to these studies, other studies found rather high percentages of feelings of anxiety after RT, ranging from 13% to 52% (Caffo et al., 1996; Maher et al., 1996; Chaturvedi et al., 1996). However, it must be mentioned that assessment points ranged from just after RT in one study to follow-up assessments of at least six months in another study which makes it difficult to attribute feelings of anxiety to the RT. Although no significant feelings of anxiety were found, one study even assessed patients who had completed RT for up to 13 years (Carpenter et al., 1989).

Depressive Symptoms. Studies after RT, revealed great variability in depression symptoms, ranging from 8%-48% of the patients reporting depressive symptoms. Several studies found low percentages of patients reporting depressive symptoms (Caffo et al., 2001; Carpenter et al., 1989; Epstein et al., 1999; Hughson et al., 1987; Irwin et al., 1986; Wallace et al., 1993). For instance, Epstein et al. (1999) revealed that 12.3% of the 65 patients reported depressive symptoms after they had completed RT from 6-12 months earlier (Epstein et al., 1999). In contrast to these studies are those of Caffo et al. (1996), Chaturvedi et al. (1996), and De Graeff et al. (1999), who all found higher percentages of depressive symptoms. Specifically, Caffo et al. showed that in a sample of 118 patients, 39% reported feelings of depression. Regarding qualitative studies, Munro et al. (1989) showed that patients interviewed at the end of treatment reported depressive symptoms as one of the ten most troublesome problems. Finally, interviewing 44 patients, Eardley (1990), found that 57% of the patients reported that they had felt depressed in the two months following completion of RT.

Psychological Distress. At different assessment points, ranging from one to three months after completing RT, both Graydon (1994) and Nail et al. (1986) reported low levels of negative mood among patients. Using the Positive And Negative
Affect Schedule (PANAS) (Watson et al., 1988) to measure positive and negative affect, Walker et al. (1996) found low levels of negative affect but high levels of positive affect. However, among 204 patients who had finished RT 7-11 years before, Bjordal & Kaasa (1995) revealed that 31.5% were still experiencing symptoms of psychological distress. Given the long period of time after RT, it is especially difficult to relate these psychological problems to RT.

In summary, the results with regard to feelings of anxiety and depression are inconsistent and varied across studies. Whereas most studies found percentages of patients reporting depressive symptoms to vary between 8%-21.5%, others found percentages approximately double this size. These high percentages of patients reporting depressive symptoms could be the result of the response format which consisted of a ‘yes or no’ response or the low cut-off score used for scoring the HADS (Caffo et al., 1996; Chaturvedi et al., 1996). Concerning negative mood after RT, levels were low. A potential explanation for these low levels may be that the sample of these studies was comprised of patients who had either Stage I or Stage II malignancies and who had received RT for the cure or control of cancer (Table 3).

**Longitudinal studies measuring psychological functioning**

*Feelings of Anxiety.* Munro et al. (1996) found that 62% of 110 patients reported feelings of anxiety at the beginning of RT. Feelings of anxiety diminished to 42% at the end of treatment (Munro et al., 1996).

*Depressive Symptoms.* Two studies used the Beck Depression Inventory (Beck et al., 1961) and showed inconsistent results. Whereas Monga et al. (1999) revealed a small improvement in depressive symptomatology from the beginning of RT to the completion of RT, Chawla et al. (1999) showed an increase in depressive symptoms during the onset of RT. That is, 12% of the patient group (N=50) reported severe depressive symptoms prior to RT compared to 38% of the patients in weeks 3-4 of RT. An improvement in the depressive symptomatology was found at three months after RT. They found that 9% of the 43 remaining patients showed severe depression.

*Psychological Distress.* Two studies found that psychological well-being remained at approximately the same level during the course of radiotherapy but significantly increased after treatment (Frischenschlager et al., 1991; Dow & Lafferty, 2000). Several other studies found that the scores for negative affect and emotional problems were highest prior to RT and then declined during the course of RT (Bye et al., 1995; Janda et al., 2000; Buick et al., 2000). However, Chandra et al. (1998) found that negative affect had not changed during the course of RT.

A possible reason for contrasting findings is that there were different baseline levels of psychological functioning among the various studies. For instance, Andersen et al. (1985) revealed that patients with an initial high level of feelings of anxiety prior to RT, reported a significant reduction in their anxiety in the course of
treatment, whereas patients with low levels of anxiety prior to RT reported significant increases in anxiety at post-treatment. Patients with moderate levels of anxiety before treatment reported little change in their state-anxiety responses. When total mood disturbances were evaluated, no differences between groups were found across the treatment days.

In sum, the majority of longitudinal studies suggest that feelings of anxiety, depressive symptoms, and psychological distress decline in the period after RT. This is consistent with studies including two assessment points as discussed in the section on cross-sectional studies. With the exception of one study, these cross-sectional studies also found a decline in feelings of anxiety, depressive symptoms, and psychological distress. Thus, taking the results of all these studies (with two or more assessment points) together, one could argue that there is a general trend towards lower percentages of patients reporting feelings of anxiety, depressive symptoms, and psychological distress after RT compared to percentages found prior to and during RT. However, cross-sectional studies showed greater variability in the percentages found during and after RT, with a number of studies showing still high percentages of patients reporting feelings of anxiety, depressive symptoms, and general psychological distress after RT (see Table 4).

Medical variables
A second aim of this review is to examine the impact of medical variables on the psychological functioning of patients treated with RT. First, studies examining differences among treatment modalities are discussed. Second, other medical variables in relation to psychological functioning and RT are described.

Psychological functioning comparing different treatment types
Feelings of anxiety. Hann et al. (1998) compared 45 breast cancer patients who had undergone surgery plus RT, with an average time since RT of 22 months, to a comparison group of 44 women with no history of cancer. Findings indicated no significant differences between the groups on state and trait anxiety. Using the HADS with a mean time of 11.5 months after RT, Rathmell et al. (1991) showed no indication for clinical levels of anxiety in two patient groups with a different treatment regime (surgery plus RT to RT only). In addition, using different assessment tools, Hughson et al. (1987) found no significant differences in feelings of anxiety between patients treated with postoperative RT and patients who received no further treatment after mastectomy.

Depressive symptoms. Comparing a surgery-only group with a group of patients treated by surgery plus RT, two studies found no significant differences in depressive symptoms (Hughson et al., 1987; Morton et al., 1984). Rathmell et al. (1991) compared 54 patients treated with RT only, to 39 patients who had undergone surgery in combination with RT. After treatment, depressive symptoms
were found for 28% of the patients with surgery plus RT and for 12% treated solely with RT. Lasry et al. (1987) investigated the psychological adjustment following total mastectomy, lumpectomy plus RT, and lumpectomy only. The global depression score of the CES-D was not significantly different among the three treatment groups. However, the lumpectomy group who had received RT had significantly higher scores on depressive symptoms than those who underwent only lumpectomy. About 50% of the lumpectomy plus RT group scored above a cut-off of 15. Usually a cut-off score of 16 is used, thus depressive symptoms might be slightly overrated in this sample (Radloff, 1977).

Psychological distress. Studies on psychological distress found no differences between different treatment groups (Fowler et al., 1996; Lim et al., 1995; Litwin et al., 1995; Schain et al., 1994; Taphoorn et al., 1994; Mose et al., 2001; Whelan et al., 2000). For instance, in the study of Whelan et al. (2000) 416 patients with breast cancer were allocated to RT whereas 421 received no further treatment. Both short- and long term assessments revealed no differences between these two groups in emotional functioning. However, comparing patients with breast cancer treated with chemotherapy with patients treated with radiotherapy Buick et al. (2000) revealed that, patients in the chemotherapy group reported higher levels of negative but lower levels of positive affect compared to patients in the radiotherapy group.

In summary, most studies regarding different treatment modalities yield no significant differences between the groups on psychological functioning. Overall, these studies suggest that patients treated with RT report no excess of feelings of anxiety, depressive symptoms, and psychological distress compared to patients treated with other cancer treatments. Moreover, it seems that cancer treatment in general lead to feelings of anxiety, depressive symptoms or general psychological distress. However, assessment points after RT varied considerably, with some studies examining psychological functioning several years after RT.

Palliative versus curative treatment. Regarding curative versus palliative treatment, both Maher et al. (1996) and Leopold et al. (1998) found that those treated palliative reported more feelings of anxiety than patients treated curatively. In addition, Leopold et al. revealed that a shorter life expectancy and cancer site, especially lung cancer, were significantly related to symptoms of anxiety.

Depressive symptoms. Comparing palliative to curative treatment Maher et al. (1996) and Leopold et al. (1998) found that patients treated palliative reported more depressive symptoms than patients treated curatively. Regarding stage of disease, De Graeff et al. (1999) showed that patients with a higher stage reported more depressive symptoms than patients with a lower cancer stage.

Psychological distress. With regard to cancer site, Munro et al. (1989) showed no significant differences in psychological functioning between patients with skin
tumors and patients with other tumor sites. For stage of disease four studies revealed no significant associations with psychological functioning (Bjordal & Kaasa, 1995; Graydon, 1994; Janda et al., 2000; Mose et al., 2001). Two authors suggested that physical side effects are related to psychological functioning (Graydon, 1994; Padilla, 1990). For example, Padilla (1990) showed that gastrointestinal side effects of RT was a significant predictor of psychological well-being. In addition, Bjordal & Kaasa (1995) indicated that patients who reported low physical functioning, a high level of pain or fatigue showed a higher level of psychological distress than patients with high levels of physical functioning or few symptoms.

To conclude, medical factors as palliative treatment and physical side effects seem related to lower psychological functioning. Findings concerning stage of disease are inconsistent, although most studies suggest no significant association with psychological functioning. Cancer site was studied by only few authors and results were inconsistent.

Conclusions and Discussion

In the preceding sections, 45 studies were reviewed with respect to psychological functioning prior to, during, and after RT. A major conclusion that can be drawn from reviewing the literature is that there is great variability in the reported results of psychological functioning. Still, some global trends can be detected.

First, we examined the psychological functioning in patients treated with RT. Before starting a course of RT, the most common reaction reported by patients were feelings of anxiety rather than depressive symptoms. During the course of treatment, most studies indicated a decline in feelings of anxiety. Interestingly, after RT, studies revealed inconsistent findings regarding anxiety. With respect to depressive symptoms, an increase of these symptoms was found during and after RT. Studies measuring negative mood, reported relatively low levels during and after RT. However, one author found a peak of negative mood during the last week of treatment. Finally, with the exception of one study, longitudinal studies reflected an improvement in psychological functioning. These longitudinal findings were consistent with studies assessing at two points in time and discussed in the cross-sectional sections. Second, we investigated the relation between medical factors and psychological functioning. Results in general showed only few differences between different treatment groups. Regarding other medical variables, there seems to be an indication that palliative treatment may lead to more feelings of anxiety and depressive symptoms than curative treatment. In addition, stage of disease does not seem strongly related to psychological functioning. There was a trend towards a positive relation between physical problems/side effects and psychological distress,
that is, the more physical side effects encountered by patients, the worse their psychological functioning.

Several findings need further clarification and are discussed hereafter. The first interesting finding of the review was that depressive symptoms were more common during and after RT than in the period prior to treatment. This is consistent with evidence showing that depression may occur somewhat later in the process of adjustment to disease and treatment (Taylor & Aspinwall, 1990).

Second, although some studies indicated that the psychological impact of RT was less dramatic than they expected, others revealed that the completion of treatment may be associated with psychological dysfunction. A possible reason for this finding is that cancer patients may enter a period in which the treatment-related factors can still influence the patients’ psychological functioning. Furthermore, the loss of a support network (i.e. relations with staff and patients) after final treatment and the uncertainty about the effectiveness of RT in eradicating or controlling the cancer could also account for these levels of psychological distress (Forester et al., 1978). Another explanation could be that patients who reported higher levels of psychological distress after RT already reported higher levels of psychological distress before and during RT. This review revealed an interaction between pre-treatment feelings of anxiety and post-treatment state anxiety (Andersen et al., 1985).

Third, results of the longitudinal studies and studies with two assessment points showed an overall improvement in psychological functioning after treatment with RT. These findings have been demonstrated in other studies on psychological functioning in cancer patients (Leventhal et al., 1980; Van’t Spijker et al., 1997). Surprisingly, the trend in cross-sectional studies indicates relatively high levels of depressive symptoms during and after RT, suggesting that the end of treatment does not automatically bring about better psychological functioning. A possible explanation for these different findings between longitudinal and cross-sectional studies could be the composition of patient characteristics in both designs. As Table 1-3 shows, cross-sectional studies were generally composed of patients with all stages of disease (I, II, III, IV) whereas longitudinal studies entailed mainly Stage I or Stage II. It is noteworthy that only two longitudinal studies assessed all stages of disease, and one of these two studies found a peak of depression during RT. However, it must also be mentioned that among several studies that focused on medical variables, no relationship was found between stage of disease and psychological functioning.

Fourth, although a number of studies indicated high levels of psychological dysfunction, studies comparing different treatments show a comparable impact upon the patients’ psychological functioning. This would suggest that the psychological impact of RT is not superimposed on that of other treatments. The wide variability in time span, with some studies examining patients years after RT, and the great
variation in assessment points within these groups, as for instance taking patients from 0-18 months after RT as one group could be a reason for not finding differences between treatment modalities.

A fifth notable finding concerns the relationship between physical functioning and psychological functioning. Previous research has shown that patients begin to experience physical side effects of RT in the second and third week of treatment. These physical side effects tend to be constant every day once they occur and peak in intensity by the last week of RT (Johnson et al., 1989). A number of studies have demonstrated a strong relationship between physical side effects of treatment and psychological distress (Christman, 1990; Maher et al., 1996; Nail et al., 1986; Peck & Boland, 1977). Consequently, it could be hypothesized that psychological dysfunction is higher in the last week of RT when physical side effects reach their peak. Indeed, our review found two studies that showed a peak of negative mood and depressive symptoms in the last weeks of RT. However, other studies in this review indicated relatively low levels of negative mood during the whole course of RT. A possible explanation for these findings could be that psychological dysfunction was masked by psychological adjustment to treatment. For instance, Johnson et al. (1989) stated that emotional responses could be considered as an outcome measure of coping with these physical side effects of RT (Johnson et al., 1989). Therefore, it remains an interesting question whether and when physical side effects predict psychological functioning and if a reduction in these side effects of RT will lead to an increase in psychological functioning in patients undergoing RT.

Several methodological considerations limit the conclusions that can be drawn based on these studies: (a) some studies used non-validated instruments; (b) often the relation between treatment-related factors (e.g. stage of illness, cancer site, time since RT) and psychological problems were not systematically examined; (c) definitions of psychological functioning varied greatly among studies; (d) relatively heterogeneous patient groups were sampled which leaves the question of who experiences negative aspects of psychological functioning unanswered; (e) use of different measurement devices; (f) variation in assessment points; (g) the preponderance of cross-sectional study designs which is a particular problem in trying to establish causality, thus limiting any conclusions about the impact of RT on psychological functioning; and (h) only three studies used a healthy reference group. Consequently, no conclusions could be drawn about whether psychological functioning of patients treated with RT differs from psychological functioning of the normal population. A final limitation concerns to what extent patients experienced psychological dysfunction. Often authors did not indicate whether feelings of psychological distress were mild, moderate, severe or reached clinical levels.

Since patients seem to experience psychological dysfunction in the course of treatment with RT, the influence of RT on psychological functioning in the long run will have to be analyzed longitudinally. These longitudinal studies must take into
account that recognition of feelings of anxiety, depressive symptoms, and psychological distress in patients treated with RT is complicated by the effects of cancer and other treatments. Finally, the previous psychological stability of the patient must be taken into account, as this factor seems predictive of the psychological adaptation to RT.

Practical Implications

Before specific recommendations can be done, there is still a need to gain further insight into psychological functioning among patients treated with RT. More specifically, is anxiety prior to RT changing into depressive symptoms during and after RT or are there two groups of patients, one showing anxiety prior to RT and the other group showing depressive symptoms at a later point in time? If the first question would be a yes, then screening, to determine those patients who are likely to show psychological dysfunction at a later point and who may benefit from psychosocial support, would be a very important tool prior to RT. Until we have answers to these questions, we will start with making some general practical recommendations.

First, feelings of anxiety may be regarded as a specific stressor because these feelings are often related to a specific situation. On the other hand, depressive symptoms and psychological distress may be more general in nature and therefore more difficult to ascribe to the treatment RT than feelings of anxiety are. Nevertheless, we suggest that feelings of anxiety, depressive symptoms, and general psychological distress should be placed into a larger context. This means that, independent of what has caused these negative feelings, psychosocial care should be aimed at helping patients cope with treatment related problems as well as helping them with other cancer related problems. Since there are still patients who report psychological problems during and after RT, we will also plea that psychosocial care such as, providing information should be given in a continuing process that may endure also after patients have completed treatment.

Second, the prevalence of feelings of anxiety before the initiation of RT suggest that it is important for radiotherapeutic oncologists and radiotherapeutic technicians to know about these negative feelings. They can use this knowledge in guiding these patients during their treatment. In addition, the social worker could anticipate by providing appropriate patient education. For these interventions, it is important to obtain baseline information on these patients and to consider patients’ individual needs. Patients could be educated about the aims of RT and misperceptions regarding RT. In addition, patients who are previously treated with RT could function as role models to educate patients who are about to undergoing RT. These interventions could be indicated, and once demonstrated, should be offered to these patients and their partners, since cancer not only affects the life of cancer patients but also that of their partners and other family members.
To conclude, although studies were few, our review showed no strong evidence that stage of disease is associated with psychological problems. However, there does seem to be a relation between physical side effects and psychological functioning. This indicates that screening procedures to detect psychological distress, should not simply look at the objective medical information but also should pay attention to the physical side effects patients report, since these subjective physical reports may be even more important for detecting psychological problems than stage of disease might be.

Box 5: Treatment with radiotherapy

Henry: Yes, I had radiotherapy. Maybe the first time I was nervous for a bit, but that was only then. The people in the hospital had told me about how things worked during radiotherapy, but I am a man who wants to see it myself. They can tell me all kinds of stuff, but I want to find out myself. I think radiotherapy was not all that bad. And, it took only a couple of minutes and then we went home to come back the next day. And this lasted for seven weeks, till treatment was completed. All things together, it took us (my wife was always with me) longer to get to the hospital than being there for my radiation. Fortunately, I didn’t get sick, I was only tired, but I didn’t want to give in to it all the time. It was nice that we could come early in the mornings, so I had the rest of the day for myself again. The taxi came at 8:00 pm and at 10:00 (sometimes 10:30) we were back at home again. In the afternoon, I took a nap, almost every day. But I have to tell you, I am not the kind of man who is sitting behind the window all day long. So, after my nap, I went back to my garden. I really love working outside. It sets my mind off things.

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