

## REGULAR REVIEW

## Long term social adjustment after treatment for childhood cancer

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The well documented improvements in survival from childhood cancer have raised questions about both physical health and psychological aspects of quality of life in survivors. This has resulted in an evaluation of physical, hormonal, and endocrine functions on the one hand, and cognitive and behavioural outcomes on the other. Far less attention has been paid to the consequences for social or emotional adjustment. Yet there are reasons to believe that it is precisely these aspects of development that may be compromised.<sup>1 2</sup> There have previously been a number of reviews concerned with physical<sup>3-6</sup> and intellectual/neuropsychological<sup>7-9</sup> outcomes. This review therefore, is restricted to the implications of cancer and its treatment for long term social and emotional development.

### Studying the long term survivor

#### JUSTIFYING THE CONCERN

The most frequently cited reason for studying long term survivors is to inform the provision and allocation of resources for subsequent cohorts.<sup>3</sup> This justification is only partially acceptable. Where long term survivors were treated before modern therapies, their experiences may be of little relevance for children undergoing more recent treatments. Some studies are of limited modern value for this reason.<sup>2 10-12</sup>

The previous focus on physical consequences on the one hand and cognitive/neuropsychological outcome on the other fails to recognise the potential inter-relationships between physical and psychological outcome. Assessment of either in isolation is unlikely to yield a comprehensive picture.<sup>13</sup> Little work to date has attempted to describe an integrated picture of long term survival.

#### SELECTION OF RESEARCH TO BE REVIEWED

The articles reviewed are based on a computerised literature search (MEDLINE). In selecting articles, we have focused on those which specifically report follow up of children and adolescents treated for cancer (under 19 years of age on diagnosis). Articles<sup>11 14</sup> that include patients diagnosed over very wide age ranges have been excluded from detailed consideration on the grounds that in these studies it is not possible to distinguish the impact of

cancer on children from that of older adults. Fobair *et al*, for example, included patients diagnosed between 5 and 65 years, and aged between 15-78 years on interview.<sup>11</sup> The impact of cancer on an adolescent rather than an older person is incomparable. Neither is it possible to select instruments appropriate to assess psychological functioning across this age range.

There is generally a consensus that long term survival may be defined as five years or more since completion of treatment. While the majority of studies adopt this working definition, others include some patients with shorter survival times.<sup>15 16</sup> We have excluded from the review studies that include only children treated for central nervous system tumours, as many of these children experience compromised central nervous system functioning, which may in itself contribute to the course of social development.<sup>7 17 18</sup>

A range of outcome measures has been employed. However, in order to facilitate some comparisons across studies, we have distinguished three categories of outcome measures. These include assessment of (1) life goals and achievements; (2) self ratings of personality (for example depression, self esteem, locus of control); and (3) more general indices of 'adjustment', usually made by parents. These categories are not exclusive; some studies include assessments of more than one type of outcome (for example O'Malley *et al*<sup>19</sup>). However, studies tend to concentrate discussion of results in relation to one type of outcome measure; in these cases, we follow a similar focus ourselves.

### Review of previous work

#### LIFE GOALS AND ACHIEVEMENTS

While a number of reports have made brief mention of the extent to which survivors have achieved 'life goals', seven studies have reported more comprehensive evaluations. Life goals are generally defined in terms of employment status, marriage or the ability to form a close relationship, birth of healthy children, and the attainment of life insurance cover (table 1).

Five of these more comprehensive studies included all survivors, regardless of the specific cancer; one included only those treated for Hodgkin's disease<sup>20</sup> and one only those treated

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Table 1 Assessment of life goals in long term survivors (self ratings)

Authors	Sample	Sample size	Control group	Refusal rate (%)	Mean (range) age at diagnosis (years)	Mean (range) time since treatment ends (years)	Mean (range) age at interview (years)	Measures
Koocher and O'Malley <sup>24</sup>	Mixed	115	Chronic illness, not life threatening <sup>22</sup>	Not given	5.7 (0-18)	12.2 (3.8-32.7)	18.04 (5.8-36)	Adjustment, standardised psychological tests, in-depth interview/life goals
Lansky <i>et al</i> <sup>23</sup>	Mixed	39	Siblings	Not given	10-18	7.1 (15 months-18 years)	23 (16-33)	Global adjustment, life goals
Green <i>et al</i> <sup>25</sup>	Mixed	227	None	38.7	11.4 (1-19)	5+	26.6 (18-44)	Marital status, employment history, current occupation, health and insurance status, reproductive history, family history
Hays <i>et al</i> <sup>26</sup>	Mixed	219	Siblings/friends	10.8	<19	2+	33.9 and 35.8	Interviews, education, employment
Wasserman <i>et al</i> <sup>20</sup>	Hodgkin's disease	40	None	11	12.8 (<12-19)	11.9 (7-19)	24.7 (10-38)	Interview, employment, marital status
Makipermaa <sup>10</sup>	Solid tumours	94	Population norms	9.6	5 days-17.5 years	10.7-27.7	11.3-41.5	Life goals, interview
Meadows <i>et al</i> <sup>2</sup>	Mixed	95	Siblings	43	6.1	5+	23.6 (18-35)	Employment, education, interpersonal relations, health status, insurance

for solid tumours.<sup>10</sup> In this latter study, it was reported that survivors had good adjustment and had generally achieved life goals comparable with the general population. Education level was similar to, or slightly above, population norms. General employment figures were not given. However, there was some evidence that males were rejected from military service because of their medical history. One woman was reported to be unemployed and drawing social security. Fewer women were married than in the general population, but the figures for men were comparable. The data point to satisfactory adjustment, but with some residual social and emotional problems, which are reflected in the lower incidence of marriage and close relationships.

Similar results were reported by Holmes and Holmes<sup>21</sup> and Li and Stone<sup>22</sup>; both included a variety of cancers. Patients who delayed marriage cited their illness as the reason. Neither study offers any general explanation for this finding. Limited earning ability and compromised physical attractiveness<sup>23</sup> have been implicated. In other respects, including education and annual income, there were no differences between survivors and controls. However, survivors did report greater difficulty in obtaining insurance cover, and when they were successful, it was for lower levels of cover. Problems with insurance were also reported by some survivors.<sup>21</sup> Koocher and O'Malley further reported that 40% of their survivors had experienced discrimination, including rejection from the military.<sup>24</sup> Where difficulties were reported, the cancer history was cited as the reason.

Few differences in life goals were found between survivors and their healthy siblings.<sup>2</sup> This applied to education levels and employment, although fewer survivors were married compared with siblings. (However, the sibling group was significantly older.) Survivors were worried about the possible recurrence of cancer, and expressed difficulties in psychosocial functioning, particularly in relationships with friends.

In a comprehensive survey of 227 survivors, Green *et al* reported that male employment did not differ from population norms, but female

employment was lower than expected.<sup>25</sup> Eleven per cent reported employment related discrimination; life insurance was significantly lower than population figures. The percentages of married men and women were lower than expected. While respondents did not claim that cancer affected their decision to marry, many cited their illness as reason for their subsequent divorce. The illness was also thought to be central in decisions not to have children.

In the most comprehensive study to date, Hays *et al* compared educational achievements and economic status between 219 survivors and individually matched controls.<sup>26</sup> Interviews were conducted by telephone. With the exception of those treated for central nervous system tumours, there appeared to be few differences between survivors and controls. However, survivors treated for central nervous system tumours continued to have problems in many areas. Hays *et al* note considerable variability in outcome for all survivors.

Other studies, though not focusing centrally on life goals, include some relevant data. For example, Lansky *et al* reported a significantly higher incidence of depression, alcoholism, and suicide attempts in long term survivors compared with sibling controls.<sup>23</sup> Almost half reported that academic plans were altered, and 38% had made changes in their career goals because of the illness. Wasserman *et al* reported that 20% of a sample of 40 long term survivors of Hodgkin's disease had encountered job discrimination.<sup>20</sup> Survivors experienced significantly more job discrimination than their siblings.<sup>12</sup> Seventy two per cent of a group of survivors had completed their educational programme, and 86% were in the process of, or had successfully implemented, realistic occupational goals.<sup>27</sup> However, survivors were more likely to have to repeat school grades than their peers.<sup>28 29</sup>

There are considerable difficulties in assessing the value of these studies that focus on long term goals, aside from the limited methodologies generally employed. First, given the general nature of the outcome variables, very large sample sizes would be necessary for adequate comparisons to be made. Second, the focus on traditional

outcome measures may be inappropriate, in that the experience of surviving cancer may influence an individual's value judgments and motivation. Indeed, there are many anecdotal reports that survivors (and their families) revise their views about what is important in life, and particularly are less likely to adopt materialistic views about life (for example O'Malley *et al*<sup>19</sup> and Koocher and O'Malley<sup>24</sup>). Such views may well influence choice of employment. These arguments may also apply to the reduced incidence of marriage reported in some studies. Whatever the reason, outcome measures such as these, which do not take into account individual motivation or decision making about life goals, will always be incomplete.

#### SELF RATINGS OF PSYCHOLOGICAL ADJUSTMENT

One reason why social and emotional consequences of treatment for cancer have been relatively ignored, at least when compared with the attention given to physical and neuropsychological variables, is that there is little consensus as to how they can best be measured. Traditional measures of adjustment, usually employed in research concerned with the immediate or short term impact of cancer, are inappropriate for older samples. Professionals who are concerned with the long term impact of cancer on children are often unaware of measures being developed in work with adult cancer patients. The result is that a battery of tests are often put together because they measure variables believed to be important, but with no clear rationale. Table 2 makes clear how arbitrary the selection of measures can be. In addition, failure to cross validate from one study to another means that it is almost impossible to make comparisons.

One variable included in most studies is depression. While there are reasons to expect depression to be a common response to diagnosis and treatment,<sup>30</sup> it is less easy to explain why depression should be prevalent among survivors. It may be that perceptions of

limited opportunities, under achievement, and compromised social contacts may operate to increase levels of depression, at least in some survivors. Such effects have not been found either when comparing survivors with peers<sup>31 32</sup> or healthy siblings.<sup>12</sup> To some extent, patients who were treated when very young, or understood little of what was happening, report a degree of self protection.

Measures of perceived control are also often included<sup>28 29</sup> on the grounds that the experience of illness may lead to more external locus of control beliefs (expecting that luck or chance are powerful determinants of health outcome compared with having a sense of control over one's destiny). Increasingly, self esteem is assessed.<sup>28 29 32 33</sup> Chronic illness is assumed to compromise self esteem through its effects on physical appearance, reduced social interaction, and limited opportunities. Other variables sometimes included are symptom inventories, and scales to measure death anxiety or mood states.<sup>33</sup> While some rationale could be made for each of these variables, no consistent theme has emerged. Many other personality traits or beliefs scales could as viably be included.

#### ADJUSTMENT RATINGS MADE BY PARENTS OR MEDICAL STAFF

These articles are summarised in table 3. Ratings are often made by parents or staff, reflecting the facts both that, in these studies, the children were younger on diagnosis and/or follow up times are shorter.<sup>34</sup> Studies are often criticised for using novel and unstandardised measures of adjustment.<sup>19</sup> Ratings made by parents or staff do not correlate highly with self rating.<sup>35</sup>

The study by Mulhern *et al* that did employ a standardised measure of adjustment, points to a number of risk factors, including functional impairment.<sup>15</sup> Other variables that have frequently been assumed to be associated with poor adjustment, including cosmetic impairment, socioeconomic status, gender, duration of treatment, treatment history (surgery or

Table 2 Psychological outcome in long term survivors (self ratings)

Authors	Sample	Sample size	Control group	Refusal rate (%)	Mean (range) age at diagnosis (years)	Mean (range) time since treatment ends (years)	Mean (range) age at interview (years)	Measures
Teta <i>et al</i> <sup>12</sup>	Mixed	450	587 siblings	16	<19	5+	>21	Depression, psychoeconomic goals
Cella and Tross <sup>33</sup>	Hodgkin's disease	60	20 friends	13	Not given	(2.5-11)	31 (20-47)	Symptom inventory, self esteem, death anxiety, sexual functioning, adjustment to illness (other raters)
Fritz <i>et al</i> <sup>31</sup>	Mixed	52	Healthy peers	8.7	9.7	3.7	15.9 (7-21)	Activity index, depression, social/peer interaction, global adjustment (other raters), openness
Chang <i>et al</i> <sup>16</sup>	Mixed	42	Population norms	5	9.7 (2-18)	Not given	17.2 (11-25)	Education, personality, interview (mothers)
Greenberg <i>et al</i> <sup>32</sup>	Mixed	138	Matched controls	Not given	3.6 (2 months-9 years)	8.8 (5-16.3)	12.5	Self concept, locus of control, depression, family environment (mothers)
Gray <i>et al</i> <sup>28 29</sup>	Mixed	62	51 healthy friends	19.5	10.7 (1-18)	14.6 (2+)	26.3 (18-37)	Profile of mood states, desirability of control, locus of control scale, control belief scale, self esteem, impact of events scale, projective tests, screening questionnaire

Table 3 Psychological outcome in long term survivors (others' ratings)

Authors	Sample	Sample size	Control group	Refusal rate (%)	Mean (range) age at diagnosis (years)	Mean (range) time since treatment ends (years)	Mean (range) age at interview (years)	Measures
Ferguson <sup>34</sup>	Mixed	18	None	Not given	2-5	4+	Not given	Telephone interviews (parents), projective tests (child)
Mulhern <i>et al</i> <sup>15</sup>	Mixed	183	None	None	2.7 (0.1-9.7)	6.9 (2.1-14.8)	12.2 (7-15.9)	Adjustment*
O'Malley <i>et al</i> <sup>19</sup>	Mixed	115	None	Not given	5.7 (0-18)	12.2 (3.8-32.7)	18.04 (5.8-36)	Psychiatric assessment, parent interview

\*CBCL=Child Behaviour Check List.

chemotherapy), and disease recurrence, were not predictive of outcome.

### Critique

Research so far is exclusively cross sectional. While not an absolute limitation in itself, the non-systematic variation in key variables is very much a limiting feature. In evaluating research to date, a number of potentially confounding factors need to be considered: inclusion of a control group, type of cancer, sample size, age of sample (at diagnosis and follow up) time since termination of treatment, and outcome measures.

#### INCLUSION OF A CONTROL GROUP

Many of the published studies do not include a comparison-group of any kind. Instead, within group comparisons are made, that is attempts are made to determine variables that contribute to better (or worse) adjustment. In the absence of any control group, comparison with population norms are often very limited.

'Control' group is not a very useful term, and comparison group would be more appropriate. The choice of such a group is difficult, and dependent in part on the question being asked. Use of a matched group of age and gender matched peers comes closest to being a control group. However, in practice, there are many pitfalls in selecting such a group. Gray *et al* allow survivors to nominate peers<sup>28 29</sup>: intending thereby to control for variables such as social class. An artifact of this method may be that only very cooperative and altruistic peers would be prepared to be used in this way (there is a preponderance of women volunteers in the Gray *et al* study). The alternative is often to trace patients admitted to the hospital for acute conditions at the time the child was diagnosed with cancer. Young adults tend to be highly mobile, and consequently many potential candidates are lost.

The second most popular choice is siblings; they share the same family environment and consequently are thought to have similar opportunities and advantages. Yet siblings of cancer patients are themselves a vulnerable group, sometimes experiencing as much or more distress and disadvantage than the patients themselves. Increasing awareness of the complexities of sibling relationships suggests that they are of limited value in assessing the impact of cancer.<sup>36</sup> Despite these

reservations, studies that include sibling groups report that outcome is worse for the survivors.<sup>2</sup>

#### TYPE OF CANCER

A number of studies have included all cases of cancer referred to a specific clinic within a defined time period, regardless of the specific diagnosis.<sup>12 21 24 28 29</sup>

Other work has focused on specific cancers; notably Hodgkin's disease<sup>14 20 33</sup> and solid tumours.<sup>10</sup> In general, poorer outcome is more likely in children treated for brain tumours<sup>7 17 18</sup> and those with residual visual deformities. Children who underwent amputation have traditionally been thought to have worse prognosis, but this is not inevitable.<sup>37</sup> Even in samples including sufficiently large numbers, there has been little systematic attempt to compare outcome in different cancers. Although leukaemia accounts for one third of cancer diagnoses, studies of long term survivors include fewer patients with this diagnosis.<sup>2</sup>

#### SAMPLE SIZE

Small sample sizes are the norm. Only the early studies<sup>12 21 24</sup> and later work by Greenberg *et al*,<sup>32</sup> Green *et al*,<sup>25</sup> and Hays *et al*,<sup>26</sup> employed samples over 100. Small sample size sometimes preclude the possibility of finding significant differences. Sample size also determines the methods of data collection and its sensitivity. Often when large samples are included, brief questionnaires are administered, sent by mail, or interviews are conducted by telephone.<sup>34</sup> Such impersonal arrangements are unlikely to foster empathy and openness in communication.

#### AGE OF SAMPLE (AT DIAGNOSIS AND FOLLOW UP) AND TIME SINCE TERMINATION OF TREATMENT

These variables are frequently confounded, with the result that it is often not clear whether or not younger patients fare better, or simply that they have had longer to recover. Increasingly it is possible for children to be diagnosed and treated before the age when they can remember very much. In these cases, detrimental experiences of cancer treatment are communicated to the children through parental memories and concerns.

## OUTCOME MEASURES

Most studies employ a mixture of standardised psychological tests and less structured interview or projective techniques, to explore in more detail experiences specifically linked to the cancer experience. The advantage of standardised tests is that it is possible to compare responses with control groups. It is notable that in most studies these comparisons are non-significant. This raises some questions about the use of standardised instruments. They may be inappropriate or lack sensitivity.<sup>38</sup>

Interviews and projective techniques more often indicate areas in which survivors differ from expected.<sup>19 28 29</sup> As no study reports that ratings of interviews or projective measures were made by 'blind' raters, it is possible that some bias is introduced in ratings. (It may be possible for a rater to remain blind as to a specific hypothesis but given the number of clues in any one interview it is not possible to remain blind as to the status or diagnosis of a survivor.)

## Summary

The majority of studies have included children with a range of cancers, though a small number have focused on a specific cancer, most frequently Hodgkin's disease. Where larger samples have been available, results are often confounded because many of the children were treated before the introduction of modern therapies, and certainly before routine psychosocial support was available. Small sample sizes, mixed diagnostic groups, and variability in follow up time and inclusion of *ad hoc*, often non-standardised measures limits the conclusions that can be drawn.

These criticisms notwithstanding, the data point to relatively good outcome for the majority. The evidence suggests that early age on diagnosis and social disadvantage increase psychological vulnerability. There needs to be a shift from cataloguing negative consequences and more awareness of patients' resourcefulness. Follow up also needs to be considered within the context in which individuals develop: the role of the family in determining long term outcome may be critical.

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