

# End-of-Life Research as a Priority for Pediatric Oncology

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*Approximately 2,200 children and adolescents die a cancer-related death each year in the United States; of these, almost 90% will die while experiencing 2 to 8 troubling symptoms. With improved symptom control and end-of-life care, these patients might suffer less before they die and their survivors might experience fewer or less intense adverse physical and mental conditions secondary to their bereavement. The focus of this article is on five key areas related to end of life where research is critically needed: (a) the characteristics of cancer-related death and the profiles of survivorship in bereaved family members and health care providers, (b) the trajectory of dying in children and adolescents and a comparison of care delivery preferred by the family and that actually delivered, (c) end-of-life decision making, (d) the financial costs of a child or adolescent dying a cancer-related death and associated policy making, and (e) outcomes of symptom-directed or bereavement interventions. Knowing the characteristics of cancer-related deaths in children and adolescents will help researchers and clinicians develop and test effective interventions related to symptom management, decision making, and availability of care delivery models that match the dying child's needs and preferences. Such interventions could also contribute to the highest quality and cost-effective care being provided to the bereaved survivors.*

**Key words:** end-of-life, decision making, financial policy, symptom management, bereavement

End-of-life care is a research priority for pediatric oncology because ultimately 25% to 33% of all children diagnosed with cancer will succumb to their disease; approximately 2,200 children and adolescents die a cancer-related death each year in the United States (Klopfenstein, Hutchinson, Clark, Young, & Ruymann, 2001; Wolfe, Grier, et al., 2000a). End-of-life research is also a priority because 89% of children and adolescents die while experiencing 2 to 8 troubling symptoms and are described by their surviving parents as having suffered "a great deal" (Hongo et al., 2003; Wolfe et al., 2000a). With improved symptom control, these children and adolescents could die with less suffering because troubling symptoms could be anticipated, prevented, or diminished. If their end-of-life care is improved, their bereaved survivors may be less prone to develop concerning health and social conditions secondary to their bereavement. Current estimates reveal that 25% of bereaved parents suffer from substance abuse, marital dysfunction, or physical or mental illness (Forrest, Standish, & Baum, 1982). To help children and adolescents who will die a cancer-related death as well as their survivors, we urgently need data in five areas of research related to end-of-life care. These research areas are described below as five pri-

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orities for improving care outcomes for patients, families, and health care providers.

*Research Priority:* the characteristics of cancer-related deaths in pediatric oncology, and the profiles of survivorship in bereaved family members and health care providers.

This research focus encompasses which patients die, when, and where they die, and which factors cause or contribute to the death; the second part of this research focus is the impact of the child's dying on the immediate survivors (their family and health care providers). Unlike the majority of pediatric oncology patients receiving curative treatment, children and adolescents who are dying are unlikely to be enrolled on a therapeutic protocol. Perhaps because of this, cancer-related deaths are not documented in a uniform manner across care settings, which makes it difficult to locate and interpret information about the characteristics of a child's dying. A definition of cancer-related death that includes acute care deaths as well as deaths that occur a considerable amount of time following the completion of cancer therapy is needed to facilitate more complete documentation of the characteristics of cancer-related deaths.

Although based on a limited number of published reports, characteristics of pediatric cancer-related deaths include (a) 50% of these deaths are of children diagnosed with leukemia/lymphoma, brain, or central nervous system cancers; (b) primary causes of death are progressive disease, treatment-related infection, and organ failure; (c) place of death varies by country, but about 50% to 60% of these children and adolescents die in a hospital. Of those who die in the hospital, almost half die in the intensive care unit. Thirty-six to 40% die at home, and about 3% die in outpatient settings (Fujii et al., 2003; Wolfe et al., 2000a). It is not known if the characteristics of dying differ by type of cancer, intensity of treatment, whether the child is on a ventilator, or by certain characteristics of the child, family, or setting. The impact of hospice care on any of the characteristics of dying a cancer-related death is not yet established; a current estimate is that less than 1% of all dying children in America receive hospice care (Kane, Barber, Jordan, Tichenor, & Camp, 2000).

Information related to the characteristics of end-of-life experiences and care for children and adolescents dying a cancer-related death has been typically obtained

retrospectively from the surviving parents or extracted from the medical record. Symptoms and their occurrence (from 1 week to 3 months before death) obtained from these two sources include poor appetite (100%), dyspnea or other respiratory symptoms (40% to 82%), fatigue (71%), nausea/vomiting (57%), constipation (46%), and diarrhea (21%) (Edwardson, 1983; Wolfe et al., 2000a). These reports suggest that symptom clusters are present in dying children and adolescents, but the exact composition and nature of the clusters are unknown; also unknown is which symptoms are most distressing to dying children, their families, or their providers. Finally, any difference in symptom reports by developmental stage or gender is unaddressed in cancer-related deaths.

It is important to determine if there is a relationship between *how* a child dies a cancer-related death and the *quality* of survivorship for the family members and health care providers. Parents have reported lingering anguish when their dying child experienced pain or other forms of suffering at end of life (Contro, Larson, Scofield, Sourkes, & Cohen, 2002), but how this may or may not place the parents at risk for adverse immediate or longer term outcomes is unknown. There are no data on health care providers regarding the effect of *how* a child or adolescent dies, but anecdotal reports imply that a cumulative effect results and can contribute to an exit of professionals from direct patient care (Papadatou, Bellali, Papazoglou, & Petraki, 2002).

*Research Priority:* the dying trajectories of children and adolescents and the models of care delivery that best match the dying trajectory

Different trajectories of dying a cancer-related death in pediatric oncology are possible. Most commonly, the trajectory is perceived by health care professionals as reflecting a concentrated focus on curative efforts with one or more relapses moving the trajectory in an up-and-down direction followed by a drop in the trajectory into terminal care (Institute of Medicine [IOM], 2003). Current though limited end-of-life literature indicates that the dying trajectory is perceived by parents as having a much more abrupt and precipitous decline toward terminal care (Hinds & Haase, 2003). The difference in trajectories could be related to the realization of the child's likely dying; in one study, health care providers realized up to a year before the parents that the child would die (Wolfe, Klar, et al., 2000b). The outcomes

for survivors (both family and health care providers) when the two trajectories are divergent or similar need to be studied.

Facilitating patient and parent preference for type and place of end-of-life care is influenced by the challenge of accurately diagnosing dying in children and adolescents (Schmidt, 2003). The current models of end-of-life care include hospital care (traditional model), hospital hospice, home hospice, and home with no hospice (IOM, 2003). Accurate diagnosing of dying may allow more time and care options for families to choose the model of care delivery best suited to them. Outcomes for the bereaved survivors when their preferred model of care does or does not match the care model received need to be studied.

*Research Priority:* end-of-life decision making

Although the factors considered by patients, parents, and health care providers when making an end-of-life decision have been studied descriptively (Hinds et al., 2001), other aspects of initiating and conducting the decision making, such as optimal timing, have not been studied. Although limited data imply that the optimal time to initiate decision making is when the child or adolescent is able to participate, the outcomes of including the child have not been well studied. In pediatric studies on medical decision making, chronically ill children have expressed a preference to be included in the decision making (Angst & Deatrck, 1996; Weir & Peters, 1997), and children with cancer as young as 6 years of age have been described as able to participate in end-of-life decision making (Nitschke et al., 1992). Patient, family, and health care provider outcomes of involvement in such decision making need further study. Interventions designed to facilitate decision making and positive outcomes need to be tested.

*Research Priority:* the financial costs of a child or adolescent dying a cancer-related death and implications for policy making

Symptom management, including physical, psychological, social and spiritual concerns, begins at the time of diagnosis of cancer and continues through end of life. End-of-life care in pediatric oncology can be initiated from days to months before a child dies, but reimbursement for hospice services is limited to the final 6 months of life (Reb, 2003), thus important palliative care efforts initiated prior to the defined 6 months may

not be reimbursable. Research designed to address ways to integrate palliative care throughout the course of illness including end of life is needed so that quality of life can be maximized and continuity of care (including referral to hospice) can be uninterrupted and without risk of not being funded.

Methods for conducting a cost-effective analysis of end-of-life care need to be developed and then used as part of the overall assessment of innovative care programs, thus allowing both the effectiveness and the cost of end-of-life treatments to be documented. This type of analysis is influenced by the need to define a good quality of death, to incorporate that definition into the cost-effectiveness ratio, and to determine the gain of a good death over a bad death in some form of a utility estimate (Pronovost & Angus, 2001). Reliable and valid measures are needed to document costs of end-of-life care and to relate these to the actual care given. Such documentation may contribute to justifying the allocation of resources to end-of-life care, contribute to the development of practice guidelines that will direct the delivery of high-quality and cost-effective end-of-life care, and increase the confidence in caregivers to provide this care (Levy & Carlet, 2001; Reb, 2003).

*Research Priority:* patient outcomes of symptom-directed interventions and of bereavement interventions

Symptom-related interventions are rarely studied in pediatric oncology end of life even though initial impressions are that pediatric oncology patients experience symptoms that are different from and more intense than those experienced by children dying of other diseases (McCallum, Byrne, & Bruera, 2000). The lack of intervention studies may in part be attributed to insufficient knowledge about the characteristics of symptoms present at end of life. Although pain, anemia and bleeding, seizures, dyspnea and cough, fever and infections, nausea and vomiting, dysphagia, constipation, anorexia-cachexia syndrome, mouth problems, pruritus, restlessness, and anxiety can occur in children dying of cancer (McCallum et al., 2000; McGrath, 1998; Stevens, 1998), their patterns of occurrence are not included in published reports. Also unknown are which symptoms are of greatest concern to patients, parents, and providers. That information would help in prioritizing symptoms for intervention studies as well as developing the timing and intensity of planned interventions.

The comfort level of health care professionals in providing symptom interventions at a child's end of life is also an area needing formal study. In a survey of 228 pediatric oncologists, 47.7% of the respondents reported having feelings of anxiety about managing "difficult symptoms" in a dying child (Hilden et al., 2001). This anxiety is aggravated by the differing types of symptoms and their intensity. For example, Collins, Grier, Kinney, and Berde (1995) studied the need for opioid infusions during the end of life of 199 children with cancer who died at a large children's cancer center. Of these 199 children, 12 were described as needing "massive opioid infusions," a level of intervention that could contribute to uneasiness in the health care providers who prescribe and administer such pharmacologic interventions.

Evaluating the effectiveness of end-of-life symptom interventions is essential but may be complicated by parent preference for recalling the quality of the child's dying. For example, Contro et al. (2002) described parents' positive opinions regarding how their children's pain was managed whether their child died in the hospital or died at home while receiving hospice care, but these same parents reported their anguish at seeing their child suffer from pain. These authors questioned whether this apparent inconsistency could result from the parents' assumption that their child must have received the best possible care that modern technology can offer and that their child's pain was therefore unavoidable. Interventions to prepare families for end-of-life symptoms need to also be developed and evaluated. Evaluating outcomes of interventions needs to go beyond reduction in the patients' symptoms to include the effects of the intervention on family members and on health care providers.

Finally, it is important to establish interventions aimed at providing maximal support to the bereaved survivors, including parents, siblings, and extended family members of the child who died as well as the involved health care providers. Although research in bereaved family members exists and indicates the need for immediate and longer term support, the precise form of support and its timing is still unknown (Stroebe, Hansoon, Stroebe, & Schut, 2001). It is imperative that we design prospective research to study the experiences of family members throughout the child's life-threatening illness and after a child's death, as outlined in the recent Institute of Medicine report on children dying in America (IOM, 2003). In so doing, the bereaved

survivors at risk of suffering complicated grief can be identified and the interventions needed to assist the bereaved survivors can be matched to the level of need.

## Conclusion

End-of-life care research is a compelling priority for pediatric oncology because of our inherent valuing of children, families, and health care providers. Preventing or diminishing suffering in a dying child may well have acute and lasting effects for the bereaved survivors, including family members and the child's health care team. Knowing the characteristics of a cancer-related death will help researchers and clinicians to develop and test effective interventions related to symptom management, decision making, and availability of care models that match the dying child's needs and preferences. Interventions of this nature will also contribute to the highest quality and cost-effective care being provided to the bereaved survivors.

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