

# Is This a Bad Day, or One of the Last Days? How to Recognize and Respond to Approaching Demise

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At the end of a long afternoon case you find a sticky-note on the operating room window informing you of a consultation request: "Consult from Staff GI. Room 527. Blair, Robt. Dx: Metastatic ca. of pancreas. Request central line for TPN." During the walk up you wonder if this is going to be necessary. The chart of this individual yields little history except a scribbled note; "Unfortunate 58 y.o. white male with history of metastatic ca. of pancreas admitted with dehydration and malnutrition. Plan: Hydration/? TPN. Discuss chemorx. options." The "yes" or "no" box indicating presence of advance directives on the front sheet of the chart is unmarked. On entering Mr. Blair's room you are greeted from the bed by an alert, sallow-complected, cachectic man who speaks in a whisper and grasps your hand with a surprisingly strong handshake. "I hope you can do something to make me stronger." His wife, sitting at the bedside, appearing overwhelmed, adds, "I can't stand to see him like this. He just doesn't seem to want to eat. He is sleeping all the time and he's been having nightmares. We both know there's no cure for this, but at least he shouldn't starve to death in the meantime! His next chemo appointment is next week. They said they might try something new. I don't think he can take it unless they put some meat on his bones." While his wife is speaking you note Mr. Blair gazing in the distance through the window. During the ensuing discussion you learn he had undergone an exploratory laparotomy 2 months previously and had a "double bypass" for his tumor. Subsequently he was treated with what they were told was a fairly new chemotherapy agent with "mild" side effects. Despite the resolution of his jaundice after his operation he continued to lose weight even though he had an initial return of appetite. During the pre-

vious 2 weeks, he had shown little interest in food or drink and he seemed to be sleeping more and more of the time. He had been receiving oxycodone (slow release) for his cancer-related back pain, with satisfactory relief and no recent dosage escalations. Earlier that week he had several nightmares about his death. Privately he confided, "I think my wife is more hopeful than I am. I'm just so tired." After this initial meeting you learn that an abdominal CT done the previous week demonstrated progression in size of his hepatic metastases.

How would we surgeons respond to the patient in the preceding vignette if we encountered him during our rounds? How could we guide him in a way consistent with our collective values and existing knowledge?

The impact a surgeon could have on a patient's dying process can be profound. Countless recollections of patients and their families testify to the lasting impressions from this time that might have been influenced by the surgeon for better or worse. In situations where heightened anxiety or fear are noted on the part of the patient or others present, inquiry can reveal traumatic memories of earlier deaths, frequently described as agonizing or horrible. Closer scrutiny will sometimes also reveal that what was assumed to be painful or distressing might have been attributable to reflex physiologic activity or the onlooker's own projection of distress. But other testimonies leave little doubt about the real agony and desperation suffered, much of it preventable had proper guidance been given.

No less is the impact the nature of a patient's dying process has on the surgeon; the surgeon might emerge from the experience with a deeper sense of the purpose of vocation, connection to others, and her own sense of self, or, conversely, the surgeon might emerge feeling inadequate, guilty, cynical, or worst of all, isolated. The impact on future patient care resulting from any of these reactions is incalculable. As daunting as the task might be, these situations always present an opportunity for

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mutual transformation, allowing for a redefinition of hope predicated not on cure, but on achievement of reconsidered goals of care.

### **Should the surgeon be involved at this time in a patient's life?**

The same attributes of gentleness, preparedness, and steadfastness that distinguish the good surgeon in the operating room apply equally in this setting. The surgeon's role during the process of dying is no different than the physician's, which has been defined as "... serving as close mentor and guide, to providing orders, prescriptions, and follow-up with staff and bereaved family members."<sup>1</sup>

The surgeon might actually be more suited for this role than many would believe. In his provocative commentary, "Is there a distinctively surgical ethics?"<sup>2</sup> Miles Little, a surgeon, describes the surgeon's "presence" as the ethical response that best fits the patient's needs related to the other four categories of experience within the relationship: rescue, proximity, ordeal, and aftermath. In describing presence, Little states, "Whenever rescue, ordeal, and aftermath are active categories of experience in the context of surgical illness and its followup, patients look for more than a nominal proximity. They want the surgeon's presence. That presence is at best a real, physical, cognitive, and engaged presence, at least a delegated presence in which junior doctors and nursing staff express the surgeon's engagement and concern. It is the fifth pillar of surgical ethics." This presence is both a virtue and a duty, fulfilling the promise of nonabandonment.

### **Who is dying?**

There are many reasons why physicians, who strive to restore health and maintain function, might be tardy or reluctant to acknowledge imminently approaching death. Some might be self-protective, or even self-serving, but it is also true that in an era in which technically disguised dying is commonplace, the dying process might be surprisingly difficult to recognize, especially to those who have more often encountered death in its unexpected or traumatic form. This article will address circumstances in which death is imminent or is an outcome expected within weeks or days. The unique problems and specific supportive approaches for unexpected death in a surgical setting are not addressed in the article, and although the philosophy of palliative

care might seem counterintuitive to trauma care or other settings where death is unanticipated, its most important principles, such as the central role of effective, empathic communication, also apply in those situations.

Many of the indicators of terminal illness (life expectancy of 6 months or less) are observable in a wide range of theoretically reversible acute or chronic conditions which, if seen solely as isolated problems of pathophysiology to be managed, deflect attention from the overall trajectory of the patient who exhibits them. So there are many patients with multiple comorbidities who, considered in the context of ongoing functional decline, weight loss, frequent hospitalizations or emergency room visits are better served by acknowledgment that their course might well be an inexorable one, not from any one condition, but from the constellation, and the goals of their care should be adjusted accordingly. Failure to do so—to persist only in isolated, organ-based problem management—often results in the distress of a prolonged dying process monoptically approached as just another problem to be negotiated. The psychologic difficulty for surgeons at this time in their patients' lives might lie in the introspective reflection necessary to recognize death as an outcome to be accepted and not an event to be managed.

One of the most reliable criteria for differentiating a bad day from one of the last days is the patient's own report. If the patient states "I am dying," or has a sense of impending doom, experience often proves him right, even if the condition proves reversible, such as an instance of near exsanguination or profound sepsis. In touch with their own bodies, getting input from places we might not palpate, auscultate, or image, such statements always demand further inquiry or exploration.

Failure to recognize the dying patient is part of the more general problem of prognosticating life expectancy. To date, there are no validated, consistently accurate, generally accepted models for predicting life expectancy in either cancer or noncancer diagnoses. Given the numerous individual and social variables that impact on the trajectory of an illness, the idea of accurate prognostication, especially for noncancer diagnoses, might be expecting too much. A study of 468 hospice referrals reflecting the national pattern of diagnoses admitted to programs showed that only 20% of prognostications of length of survival were accurate within 33% of actual survival. Sixty-three and one-half percent of physicians overestimated survival, averaging five times greater than

the actual survival. More experienced physicians were more accurate, and those with a longer acquaintance with their patient tended to overestimate survival. In a hospital setting in which the patient is more likely to encounter physicians with whom they have no previous relationship, there might be a greater likelihood of an overly pessimistic prognostic assessment.<sup>3</sup>

With the increasing emphasis on evidence-based medicine, more accurate prognostication guides are likely to emerge. For those working in the field of hospice and palliative care, the clinical and regulatory (to qualify for Medicare Hospice Benefit reimbursement) standard for prognostication for noncancer diagnoses (congestive heart failure, COPD, Alzheimer's, and others) has been the National Hospice and Palliative Care Organization's (NHO) *Medical Guidelines for Prognosis in Selected Non-Cancer Diseases*<sup>4</sup> (Table 1), correlated with a Karnofsky Scale score of 50 or less (Table 2). Others have developed validated instruments for prognosticating survival in patients with malignant disease,<sup>5</sup> and other studies<sup>6</sup> have established median survival times for cancer patients with particularly ominous prognostic factors (Table 3). Knaus and colleagues<sup>7</sup> concluded in their study of the SUPPORT prognostic model for critically ill patients that the best survival estimates combine an objective prognosis with a physician's clinical estimate.

The NHO guidelines were meant to predict which noncancer patients with specific diagnoses are likely to die within 6 months for the purpose of certification for the Medicare Hospice Benefit. The authors state that the guidelines are a consensus statement that is not entirely evidence based. Although the accuracy of these guidelines might be in doubt, they at least provide a clinical starting point for thinking in a prospective and proactive way about a number of advanced and incurable illnesses.

Recognizing that clinical judgment still plays the major part in prognostication, a simple rule-of-thumb query popularized by Joanne Lynn, a well-known national leader in palliative care, makes sense until evidence-based approaches are established: "Would you be surprised if this patient died within the next year?"<sup>8</sup>

Because of invasive treatments (mechanical physiologic system support), communication difficulties, and polypharmacy, the constellation of signs heralding rapidly approaching demise might not be readily appreciated. The diagnosis is made by an appreciation of a constellation of signs in the setting of advanced disease

coupled with the unique intelligence provided by the patient.

Regardless of diagnosis, observable changes during the last days of life include (Table 4): profound weakness (asthenia) and bed-bound state, sleep much of the time, indifference to food and fluids, difficulty swallowing, disorientation to time with increasingly brief attention span, low or lower blood pressure not related to hypovolemia, urinary incontinence or retention caused by weakness, loss of ability to close eyes, oliguria, vivid dreams or nightmares, patient reports of seeing previously deceased individuals important to the patient, frequent references to "going home" (not their street address!), or speech content related to travel to a final destination. Richard Twycross, a preeminent British palliative medicine authority, describes a shifting of the patient's focus during this time from "doing" to "being."<sup>9</sup>

Very late changes (Table 5) related to changes in both brain stem and cortical function heralding demise within a day to hours include: changes in respiratory rate and pattern (Cheyne-Stokes, apneas); mottling and coolness of skin from vasomotor instability with venous pooling, particularly in the pretibial region; dropping blood pressure with rising, weak pulse; and mental status changes (delirium, restlessness, agitation, coma).

The majority of patients are comatose at time of death, though up to 30% of patients are reported to be alert until moments before death.<sup>10</sup> The often expressed wish, "I want to die in my sleep" is actually what appears to happen for the majority of patients, though the sleep is actually coma. Two divergent patterns ("road to death") of neurologic change that occur with the dying process have been described.<sup>11,12</sup> The usual road to natural death progresses from a normal level of alertness through stages of sleepiness, lethargy, obtundation, and, finally, coma before death. For the unlucky patient and onlooker, the difficult road to death is characterized by a process of increasing neurologic irritability commencing with restlessness and progressing through states of confusion, tremulousness, hallucinations, agitated delirium, myoclonus, and seizure before lapsing into coma. The presence of intracerebral metastases or accumulation of metabolites from disease or medication that can act as CNS irritants increase the likelihood of travel on the difficult road.

Of historical interest was Sir William Osler's description of nearly 500 death beds he had attended. Despite his careful observations and frequent publications on a

**Table 1.** Selected Medical Guidelines for Determining Likelihood of Survival of 6 Months or Less in Noncancer Diseases

- I. Heart disease: A and B should be present.
- A. Symptomatic at rest
    1. New York Heart Association Class IV
    2. Ejection fraction < 20%
  - B. Optimally treated
    1. Diuretics
    2. Vasodilators
  - C. Other factors
    1. Refractory arrhythmias
    2. History of cardiac arrest
    3. History of syncope
    4. History of cardiogenic brain embolism
    5. Progressive HIV disease
- II. Lung disease: A to D should be present.
- A. Severe lung disease
    1. Dyspnea at rest
    2. Unresponsive to bronchodilators
    3. Postbronchodilator FEV<sub>1</sub> < 30% of predicted
  - B. Progressive lung disease
    1. Recent emergency room, hospital treatment
    2. FEV<sub>1</sub> loss of 40 mL in 1 year
  - C. Hypoxemia at rest
    1. O<sub>2</sub> saturation < 88% on room air, or
    2. PO<sub>2</sub> < 55 mmHg on room air
  - D. CO<sub>2</sub> retention: PCO<sub>2</sub> > 50 mmHg
  - E. Other factors
    1. Evidence of cor pulmonale
    2. Unintentional weight loss of >10% body weight in 6 mo
    3. Resting heart rate > 100/min
- III. HIV disease: A to C should be present.
- A. CD4+ count < 25/μL, or
  - B. Viral load > 100,000 copies/mL
  - C. Infectious/neoplastic complication, untreated or refractory: At least one of the following:
    1. CNS lymphoma
    2. Progressive multifocal leukoencephalopathy
    3. Cryptosporidiosis
    4. Wasting (loss of >33% lean body mass)
    5. *Mycobacterium avium* complex bacteremia
    6. Visceral Kaposi's sarcoma
    7. Renal failure
    8. Advanced AIDS dementia
    9. Toxoplasmosis
  - D. Other factors
    1. Diarrhea > 1 y
    2. Serum albumin < 2.5 gm/dL
    3. Substance abuse
    4. Age > 50 y
    5. Foregoing antiretroviral and prophylactic therapy
    6. Congestive heart failure
- IV. Liver disease: A and B should be present.
- A. Laboratory indicators: Both should be present.
    1. Prothrombin time > 5 sec over control, or international normalized ratio > 1.5
    2. Serum albumin < 2.5 gm/dL
  - B. Clinical syndromes: At least one of the following:
    1. Ascites, refractory to sodium restriction and diuretics
    2. Spontaneous bacterial peritonitis
    3. Hepatorenal syndrome
    4. Hepatic encephalopathy, refractory to protein restriction and lactulose
    5. Recurrent variceal bleeding
  - C. Other factors
    1. Progressive malnutrition
    2. Muscle wasting
    3. Active alcoholism
    4. Hepatocellular carcinoma
    5. Positive hepatitis B surface antigen

FEV, forced expiratory volume in 1 second; PCO<sub>2</sub>, partial pressure of carbon dioxide; PO<sub>2</sub>, partial pressure of oxygen.

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wide variety of other medical subjects and his interest in death and the afterlife,<sup>13</sup> he never published his observations on the dying. One wonders why. He did discuss his experience in the Ingersoll Lecture entitled "Science and Immortality" given at the Harvard Medical School in May 1904. He observed, similarly to others, ". . . ninety suffered bodily pain or distress of one sort or another, eleven showed mental apprehension, two positive terror, one expressed spiritual exaltation, one bitter remorse. The great majority gave no sign one way or the other; like their birth, their death was a sleep and a forgetting."<sup>14</sup>

Many patients and their families, including those with advanced education, have false preconceptions of the usual pattern of natural demise. These fears might be the result of "wives tales" or an overgeneralization of a traumatic death they had previously witnessed. Some of these fears include "choking to death" or "fighting for air" when dying of pneumonia or even dying in the absence of any cardiorespiratory system pathology. Others assume that exsanguination is a common terminal event in cancer, regardless of its source or location. Many fear that physical agony is as inevitable in dying as labor pains are in childbirth. By willingly and calmly discussing these fears and providing accurate information, the surgeon can do much to dispel these particularly burdensome fears. To balance the generally favorable prognosis for peaceful dying is the fact that even in home or hospice care a small percentage of patients (8.5%) were denied a peaceful death because of hemorrhage, hemoptysis, restlessness, respiratory distress, regurgitation, pain, and myocardial infarction.<sup>15</sup>

## Communication

Who will bell the cat? The most daunting task in providing assistance to dying patients is the acknowledg-

**Table 2.** Karnofsky Scale

100	normal, no complaints, no evidence of disease
90	normal activity, minor signs/symptoms of disease
80	normal activity with effort, some signs/symptoms disease
70	cares for self, unable to do active work
60	needs occasional assistance, mostly self care
50	needs considerable assistance, frequent medical care
40	disabled, needs special care and assistance
30	severely disabled, hospital admission indicated though death not imminent
20	very sick; active supportive treatment necessary
10	moribund, fatal processes progressing rapidly

ment that dying is, in fact, occurring. The same principles that govern communication in any other situation of importance certainly apply in this one. In the second article of this series,<sup>16</sup> communication was described as a part of the surgeon's armamentarium that could be likened to any other procedure in which the outcome is the first step to all that follows in a patient's life and a family's memory.

Just as in a physical operation, the psychologic operation of giving the news of approaching demise can be fraught with unexpected developments or complications that require a range of immediate pharmacologic, social, and spiritual interventions. In some institutions, this range of support is well organized and available in the form of a hospice or palliative care interdisciplinary team. The surgeon's willingness to engage this assistance is not only supportive to the patient in itself, but is also greatly helpful to the work of the team. Though many surgeons can be reluctant to share their own feelings in these situations, they might be pleasantly surprised at the salubrious effect of sharing their reflections with skilled listeners who themselves are experienced in caring for dying patients and bereaved families.

**Table 3.** Determining Prognosis in Advanced Malignant Disease—Median Survival

Functional ability: single most important predictive factor
Median survival of 3 mo: Karnofsky $\leq$ 50 or ECOG $\geq$ 3
Patients with solid tumors typically lose 70% of functional ability in last 3 mo of life
If more than 50% of time is spent sleeping or lying down and is increasing, median survival is 3 mo, often less with increasing symptoms, especially dyspnea
Most solid tumors that progress through 2 rounds of chemotherapy: $<$ 6 mo
Hypercalcemia: 8 wk (except newly diagnosed myeloma or breast cancer)
Pericardial effusion: 8 wk
Carcinomatous meningitis: 8–12 wk
Multiple brain metastases: 1–2 mo without radiation, 3–6 mo with radiation
Malignant ascites or pleural effusion: $<$ 6 mo
Most metastatic solid cancers, acute leukemias, high-grade lymphomas not on chemotherapy: $<$ 6 mo

ECOG, Eastern Cooperative Oncology Group.

**Table 4.** Changes Consistent with Demise Approaching Within Weeks to Days

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Progressive, profound weakness and fatigability
Bed bound
Sleep much of the time
Disinterest in food and fluids
Difficulty swallowing (not related to obstruction)
Weakening voice
Loss of ability to close eyes
Urinary incontinence
Oliguria
Dropping blood pressure not related to hypovolemia
Disorientation to time
Decreasing attention span
Vivid dreams or nightmares
Reports by patient of seeing previously deceased individuals important to them
Speech content containing references to home or travel to a final destination

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The practitioner might be puzzled when a patient and family members seem surprised to learn that death might be only weeks or days away, even though they might have been told their condition was terminal. In this instance, the patient has probably understood the term to describe a state of incurability, not a description of approaching death. Some patients welcome the news as a release from a long siege (“When will all this end?”), and others are often grateful, despite mixed emotions of anxiety and sadness, because the information offers them a final chance to close out their affairs and say their good-byes.

The fear of taking away a patient’s hope by disclosure of the truth is not supported by evidence. To the contrary, there is abundant evidence that the overwhelming percentage of patients wish to know the truth of their condition,<sup>17</sup> even if the outlook is unfavorable. Rather than undermining hope, truthful, empathic disclosure can actually become the basis of trust that provides the necessary background for a redefinition of hope.

When discussing the imminence of death with patients or their families, the surgeon might recall previous patients who lived several days when only hours were expected, and so use circumspection in this prognostication (“hours or a few days, but not likely longer . . .”) This is also the time to reassure the patient and family that nothing will be done to prolong their suffering, anything that might help will be attempted to relieve it, and that they will not be abandoned.

**Table 5.** Changes Consistent with Demise Approaching Within Hours

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Respiratory changes: Cheyne-Stokes respirations, apneas (not related to opioids)
Mottling and coolness of skin, particularly in the pretibial and dependent portions of the body
Somnolence, obtundation, coma
Restlessness, agitation, delirium
Audible secretions (“death rattle”)
Dropping blood pressure
Tachycardia

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### Interventions

As death becomes more imminent and the goals of care redefined, the plan of care similarly needs to be scrutinized. The vague, vacuous phrase “comfort measures only” is of little help, because this needs to be a time of heightened attention to the details of care for their appropriateness. Table 6 shows suggested orders for terminal care. Current problems need to be assessed, future problems anticipated, and interventions evaluated for their therapeutic aims, benefits, burdens, and efficacy.

Very often blood sampling or x-rays can be dispensed with, and routine vital signs limited to counting pulse and respiratory rates while the staff is nonetheless a comforting presence in the room. Potentially distressing procedures, such as decubitus care or bathing, should be done with attention to adequate pretreatment analgesia or sedation, and carried out in an unhurried, gentle manner.

The pharmacologic regimen can often be pruned as well. Vitamins, iron preparations, cholesterol-lowering drugs, stool softeners, potassium supplements, and the like can usually be stopped because they are no longer appropriate to the circumstances. Especially in the face of diminished intake, oral hypoglycemics and insulin should be down-titrated or discontinued, as can many antihypertensives. Anticoagulants (especially prophylactic heparins) are infrequently appropriate, and the need for antibiotics should be questioned. Routine use of diuretics might compound hypovolemia or hypotension, cause electrolyte disturbances, and worsen the perception of thirst.

In addition, the routes of medication administration should be reviewed and the least obtrusive, most effective, and most patient-acceptable route chosen. For most patients, this is oral or, perhaps, transdermal or rectal. Patients with dysphagia should receive sublingual or liquid preparations; morphine is commercially available as

**Table 6.** Suggested Orders for Terminal Care

Pulse and respiration count each shift	Parameters for MD notification
	Temperature for apparent fever only
Routine mouth care (swab) q 2 h	Artificial saliva to tongue, lips, palate q 4 h
Moisturizing eye drops q 4 h	
Reposition/skin care q 2 h	Premedicate as needed
Tylenol suppository q 4 h prn T > 100	
Scopolamine 1.5 mg patch q 48 h prn secretions	Alternatively, atropine 0.4 mg q 4 h prn secretions
	Foley catheter (?)
Pain regimen	Tylenol suppository q 6 h for comatose patients on no other analgesics
Dyspnea regimen	
Restlessness/delirium regimen	
Code status	

concentrate (Roxanol [Roxane Laboratories, Columbus, OH], 20 mg/mL), and can be compounded at concentrations up to 100 mg/mL; haloperidol, lorazepam, several NSAIDs, and atropine are also available as liquids. Patients with nausea or emesis absorb oral medications irregularly and should receive them parenterally, as should stuporous or unconscious patients who are not within hours of death. Intramuscular injections should be avoided because they are painful, and either continuous or intermittent subcutaneous routes used, or a pre-existing intravenous site accessed; the drugs most frequently needed in controlling terminal symptoms (morphine, hydromorphone, metoclopramide, haloperidol, lorazepam, decadron) can all be administered by the subcutaneous route, and many of them can be mixed in a single syringe driver.<sup>18</sup>

The roles for artificial nutrition and hydration have been discussed earlier in this series.<sup>19</sup> Suffice that there is usually little justification for continuing artificial nutrition under these circumstances. Artificial hydration might improve renal excretion of toxic metabolites in some patients with encephalopathy or delirium, but in general administration of crystalloids to hypoproteine-mic patients only increases edema, lung water, and tracheal secretions; it is best avoided in most instances.

## Common symptoms at the end of life

### Pain

The need for ongoing pain assessment and control continues even for those imminently dying. Lichter and Hunt,<sup>20</sup> in a survey of hospice patients in the last 48 hours of life, found that opioid doses were decreased in 13%, and 44% required an increase, 43% stayed the same, and more than 50% developed pain from a new

source. Common sources of new pain include such pedestrian causes as urinary retention and fecal impaction, so careful ongoing assessment is needed.

In view of data such as these, because unresponsive patients still perceive and can be distressed by pain, and because discontinuation of opiates might precipitate withdrawal symptoms, continuation of opioid therapy is recommended throughout the last days. As level of consciousness declines and urine output falls, the dosing frequency can be lengthened to 6 hours (immediate-release preparations) in the absence of signs of distress, and the total daily dose decreased.

### Dyspnea

The causes of dyspnea—a subjective sensation of breathlessness—in this group of patients is often multifactorial and accompanied by anxiety and tachypnea. Assuming reasonably treated causes have been dealt with, the goals of care are to decrease the work of breathing, mostly by decreasing the respiratory rate—usually to fewer than 20 respirations per minute—with morphine or hydromorphone; this can be done with as little as 5 to 10 mg morphine orally every hour as needed, though the patient who is not opioid-naïve might require substantially higher doses to achieve the desired effect. An anxiolytic such as lorazepam or diazepam should also be considered, as should a short course of a diuretic if excessive lung water is present. Supplemental oxygen will be helpful for the patient with arterial desaturation, and might be of benefit in patients with congestive heart failure, though much of the reliance on its use seems to be a matter of habit and cultural expectation in this country; palliative care programs in the United Kingdom find a fan blowing across the face often

to be as effective, without the encumbrances of technology or the drying of mucous membranes.

### **Airway secretions and noisy breathing**

The inability to clear secretions from the upper airway or oropharynx can result in noisy or gurgling respirations, particularly as patients weaken or become stuporous; they are especially prevalent in patients who have been vigorously hydrated in the preceding days. They might be more distressing to those in the room than to the patient, and reassuring explanations to the caregivers about this, the causes, and the significance are most helpful.

Frequent repositioning of the head and torso to one side or another helps, and some oral secretions can be gently wiped away; suctioning should be judicious and infrequent, as repeated suctioning is irritating and stimulates further secretions or retching. Anticholinergics such as scopolamine (available as a 1.5-mg transdermal patch) will help dry secretions, as will atropine (0.4 mg sublingual or subcutaneous every 4–6 hours). Amitriptyline 25-mg suppositories every 6 hours might also be helpful, with the added effect of sedation. None of these interventions is as effective once secretions are established, and early intervention at the first sign of their presence is important.

### **Restlessness and delirium**

Restlessness occurs commonly in end-stage illness, though its cause might not be clear, so its treatment is often empirical. It is typified by agitation with or without anxiety, motor hyperactivity, moaning, and might include frank myoclonus. Correctable causes should be sought and dealt with appropriately: inadequately treated pain, urinary retention, fecal impaction, hypoxemia, pruritis, drugs (neuroleptics, prokinetics, phenothiazines, corticosteroids, anticholinergics), sepsis, and psychic or spiritual anguish. Myoclonus, often from opioid or other drug metabolite accumulation, might respond to opioid rotation or reduction (eg, morphine to hydromorphone), a brief course of hydration, or low-dose benzodiazepines.

Frank delirium (hyper- or hypoactive psychomotor activity with cognitive impairment) can be seen in up to 80% of patients dying of cancer (source), and is often more problematic at night. Haloperidol is the drug of choice and mainstay of treatment, in doses from 4 to 30 mg/day, often using higher doses in the late afternoon and evening. Chlorpromazine (200 to 800 mg/day) or

methotrimeprazine (Levoprome [Immunex Corp, Seattle, WA], 6 to 25 mg/day) can be used if increased sedation is required. Short-acting benzodiazepines such as lorazepam can be added if anxiety is a prominent feature, though paradoxical worsening (disinhibition phenomenon) can occur and longer-acting drugs (diazepam, clonazepam) might be required.

In conclusion, the death of a patient marks only the physical end of the dying process. Expressions of the social and spiritual dimensions of dying continue, whether it is the actual pronouncement of death<sup>21</sup> and signing of the death certificate, calling hours at the funeral home, sending a condolence letter,<sup>22</sup> or attending a memorial service. Even when the physical demise has occurred, the momentum of social, economic, and spiritual change that has occurred in the patient's life is transferred to those closest to him, including the surgeon. Recognizing this form of "conservation of energy" and sharing in it might enable the surgeon to feel less isolated by the prospect of losing the patient to death. The dying process ends when regeneration begins.

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### **Appendix**

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