

Gestational Ageism

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Published guidelines for resuscitation of extremely premature infants emphasize the importance of the gestational age of the infant. However, some ethicists and pediatricians have questioned these guidelines, suggesting that this may represent a form of discrimination. A policy of nonresuscitation of elderly patients older than a certain age would constitute a form of ageism and would likely be unacceptable to the broader community. Are resuscitation decisions for premature newborn infants analogous to resuscitation of elderly patients? Are current neonatal resuscitation guidelines discriminatory?

This article looks at the relationship between discrimination based on gestational age and chronological age. There are 2 levels of gestational ageism and 2 separate strands of argument against gestational age guidelines. I conclude that resuscitation decisions for premature infants share many features with those for elderly patients, although there are also some relevant differences. I propose the use of gestational age equivalence as an alternative framework for practice.

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In mid 2002, a group of physicians and intensive care specialists in Portland, Oregon, came together during a series of meetings to review the management of elderly patients following out-of-hospital cardiac arrest. The group was concerned about inconsistency in treatment decisions and reviewed available local, national, and international data on survival and long-term morbidity. It developed a consensus guideline that strongly recommended resuscitation for patients aged younger than 65 years at the time of arrest. However, for patients aged older than 75 years, the guidelines indicated that active resuscitation should not be initiated because of a less than 5% chance of survival with favorable neurologic outcome. Similar consensus guidelines have been generated in Australia and other parts of the world, and they have been included in statements from professional organizations and resuscitation councils. These recommendations have been widely accepted as an ethically appropriate response to the high burden of treatment and low chance of successful resuscitation in this population.

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In reality, of course, there were no such recommendations.

To my knowledge, there are no professional bodies that have publicly endorsed age limits for resuscitation in elderly patients, although the figures for survival chances are real.¹ The group in Oregon² and the consensus conference in Australia³ consisted of newborn intensive care specialists and obstetricians. Their recommendations were about resuscitation for extremely premature infants. Numerous similar national and international guidelines have been published (**Figure 1**).⁹

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Infants born prior to 25 weeks' gestation have a significant chance of dying despite intensive care or of being severely impaired if they survive. Their outcome is related to the gestation at the time of delivery (**Figure 2**). There are no published reports of survival prior to 21 weeks' gestation, while the chance of survival for resuscitated infants born at 26 weeks or later is more than 80%.¹³

Extremely premature infants almost always require resuscitation and respira-

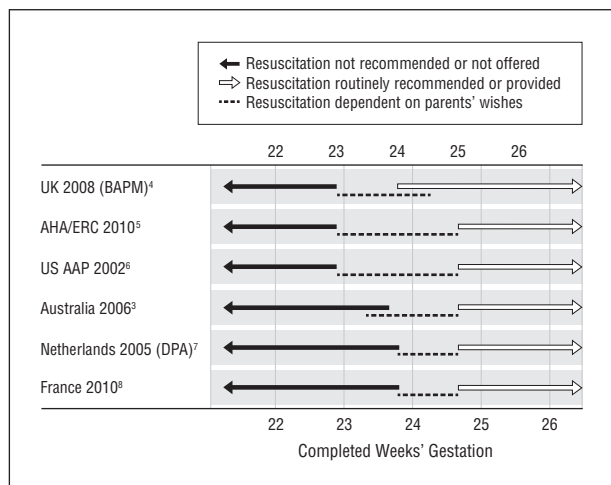


Figure 1. A schematic representation of recent guidelines relating resuscitation decisions to gestational age in extremely premature infants. AAP indicates American Academy of Pediatrics; AHA, American Heart Association; BAPM, British Association of Perinatal Medicine; DPA, Dutch Pediatric Association; ERC, European Resuscitation Council; and UK, United Kingdom.

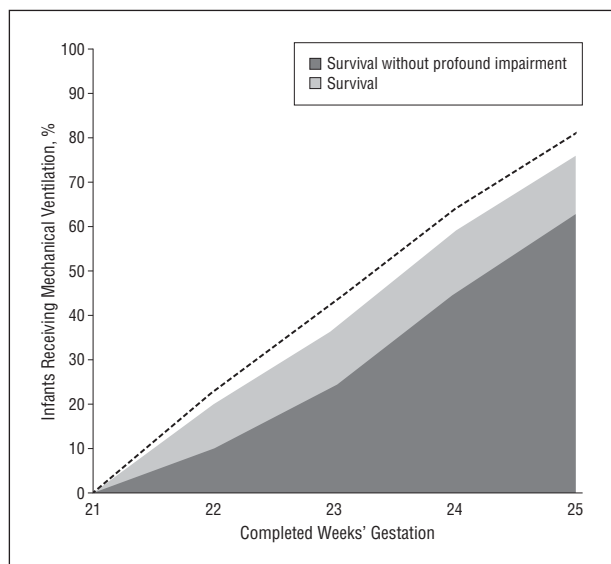


Figure 2. Chances of survival and survival without profound impairment in infants receiving mechanical ventilation in the National Institute of Child Health and Development Neonatal Research Network centers between 1998 and 2003.^{10,11} The dotted line indicates more recent survival figures for infants receiving intensive care in California in 2005-2008.¹²

tory support at birth. In many parts of the world, parents are provided with the option of resuscitation or nonresuscitation. Guidelines have been published indicating when it is appropriate to offer parents this choice (Figure 1). These guidelines overlap considerably; most indicate that before 23 weeks' gestation, resuscitation should not be performed, while infants with gestational ages of 25 weeks or more should always be resuscitated. In between these points, resuscitation is usually dependent on the views of the parents.

Yet recently, this approach to decision making in newborn intensive care has been challenged. A number of authors have questioned both the ethical and scientific basis for boundaries such as those endorsed in current guidelines.¹⁴⁻¹⁷ A policy of nonresuscitation of patients older

than 75 years would constitute a form of ageism and would likely be unacceptable to the broader community.

Are resuscitation decisions for premature newborn infants analogous to resuscitation of elderly patients with out-of-hospital cardiac arrest? Are current neonatal resuscitation guidelines discriminatory? This article looks at the relationship between discrimination based on gestational age and chronologic age. There are 2 levels of gestational ageism and 2 separate strands of argument against gestational age guidelines. I propose the use of gestational age equivalence as an alternative framework for practice.

AGEISM AND GESTATIONAL AGEISM

The term ageism was first used by Robert Butler in 1969 to refer to a form of prejudice analogous to other forms of bigotry such as sexism or racism.¹⁸ It is often used to encompass negative stereotypes and attitudes toward older people.¹⁹ In health care, ageism is particularly associated with age-based rationing of treatment.²⁰⁻²²

There are different forms and degrees of ageism. A strict form of age-based rationing would use age cutoffs for treatment. More moderate forms of ageism might include age as one factor that influences decisions about treatment.^{20,23} Analogously, gestational ageism (ie, less favorable treatment on the basis of gestational age) could be divided into strict and moderate forms.

There are 2 broad types of argument against age-based rationing. The first type targets the use of age per se as a criterion. It is claimed that there are other factors than age that determine a patient's chance of responding to a treatment, biological age may not be the same as chronological age,²⁴ and elderly patients do not necessarily have a higher mortality.^{20,25} The second type of argument targets the ethical justification for treating elderly patients differently. This is argued to be unfair and inconsistent.^{20,25} These 2 types of argument have parallels in the debate about gestational age guidelines.

GESTATIONAL AGE AS A CRITERION FOR NONTREATMENT

One problem with gestational age criteria for resuscitation is that available methods of assessing gestational age are uncertain.^{10,15,26} Estimates based on ultrasound or date of the last menstrual period may err by 1 to 2 weeks, which could make the difference between treatment not being offered or being routine.²⁷ But in some cases, dates may be more certain. Furthermore, the epidemiologic evidence about survival for extremely premature infants is based on infants where gestation was similarly uncertain and thus remains applicable. A separate problem is that some infants at younger gestational ages in previous studies have not received active resuscitation. This potentially makes low survival rates a self-fulfilling prophecy^{26,28} and underestimates the chance of survival (if treatment is provided).

A second argument against gestational ageism is that there are other factors apart from gestational age that influence the outcome for an infant. A female infant of 23 weeks' gestation treated with antenatal steroids has a simi-

lar chance of survival to a growth-restricted 25-week-old male infant who has not received steroids.¹⁰ Several recent studies have explored the possibility of combining different variables into a prediction model.^{10,12,29} However, these studies and models do not ignore gestational age, which remains an important factor in determining outcome.

Next, age-based criteria could be criticized for being arbitrary. Why should a single day (or even a single hour) make the difference between an infant receiving or not receiving resuscitation? Yet, there are degrees of arbitrariness. There is a precipitous increase in survival chances between 22 and 25 weeks' gestation. The chance of death falls by almost 3% per day. By contrast, the chance of successful resuscitation following out-of-hospital cardiac arrest falls approximately 7% from age 55 to 75 years (0.001% per day).^{1,30,31} Second, there appears to be an absolute limit for the possibility of successful resuscitation of extremely premature infants (21 weeks). There is no such clear limit for elderly patients. Age-based cutoffs are considerably less arbitrary for premature infants than for older patients.

In any case, the mere fact that a cutoff point is arbitrary does not mean it is illegitimate. Thresholds are used to determine who will receive cardiac transplantation³² or in vitro fertilization,³³ which medications will be publicly funded, and which individuals are allowed to drive. It is arbitrary whether the driving age should be 18, 17, or 16 years. But that does not mean that there should not be an age at which drivers' licenses are first provided.

TREATING PREMATURE INFANTS DIFFERENTLY

The second group of arguments against gestational ageism targets the special treatment of premature newborn infants. The focus is not the use of gestational age for decisions, but rather that the standard appears to be different.

The threshold for limiting life-sustaining treatment in premature infants does appear to be different from older patients. There is no other patient group in which a 50% chance of survival and a 50% chance of an abnormal outcome if the patient survives would be thought bad enough to justify nonresuscitation.³⁴ In a survey, physicians and students were less inclined to resuscitate a premature infant than an older infant or adult with identical chances of survival and long-term morbidity.^{34,35} It has been suggested that this reflects a form of prejudice against premature infants.³⁵

But could there be differences between extremely premature newborn infants and older patients that would justify a different approach? One potential difference is in the harm of treatment. The burden of treatment is likely to be substantial for an infant born at 23 or 24 weeks' gestation; these infants have a minimum hospital stay of 3 months, almost half have surgery for a patent ductus arteriosus,³⁶ more than one-third have severe bronchopulmonary dysplasia,³⁶ and many require prolonged mechanical ventilation.³⁷ While older patients may also have a prolonged hospital stay and high morbidity, the median hospital stay was only 2 weeks in a study of octo-

genarian or nonagenarian survivors of out-of-hospital cardiac arrest.³⁰ On the other hand, the potential benefit of treatment is also considerably greater for a newborn because they may survive for decades.

A second potential difference is that resuscitation for very premature infants can sometimes be carefully discussed and considered in advance. This provides the opportunity for a degree of advance planning that is often impossible for older patients who are acutely unwell. It potentially means that decisions in the delivery room for premature infants are about withholding resuscitation, while decisions for older patients after a cardiac arrest focus on whether treatment should be withdrawn. Health care professionals often prefer to withhold than withdraw treatment.³⁸ It is less clear though that this should influence decisions because ethical analysis, professional guidelines, and case law find no ethical or legal distinction between them.^{39,40}

But a related factor may be more significant. The ethical principle that carries most weight for decisions in adults is the principle of autonomy.⁴¹ However, at the time of resuscitation, the patient's wishes are often not available. It may be that treatment is initially provided in the hope that the patient's wishes will become apparent. Where this remains unclear, treatment is guided as in newborn infants by an assessment of what would be in their best interests.⁴² Is there a difference between best-interest judgments for premature newborn infants and older patients? One difference is that families do not play as large a role for adults, except to provide evidence of what the patient would have wanted. But for children and perhaps particularly for newborn infants, families' views do influence the determination of whether treatment should be provided.⁴³ This is appropriate because the interests of the infant and the family overlap in ways that are hard to separate and because in the face of uncertainty about the benefits and risks of treatment, the values of parents should carry weight.⁴⁴ It has also been suggested that the risks of treatment should be weighed differently for a newborn infant.⁴⁵ These reasons may explain why clinicians are more willing to withhold treatment for a newborn infant even though the clinician judges treatment to be in the patient's interests.^{34,46}

ALTERNATIVES TO GESTATIONAL AGEISM

If we reject gestational age-based guidelines for treatment, what are the alternatives?

Individualized Decisions

The American Academy of Pediatrics' most recent statement on counseling deliberately eschewed specific gestational age boundaries for resuscitation.^{14,47} In their place, it recommended a strategy that incorporates "all relevant factors" in assessing prognosis.⁴⁷

However, there are potential problems with this approach. One alternative to making decisions prior to delivery is to assess the infant after birth.⁴⁸⁻⁵⁰ This can involve assessment of the physical maturity, condition at delivery, response to resuscitation, and/or response to initial intensive care treatment.^{50,51} Yet, physicians' ability

Table. An Explicit Prognostic Strategy For Resuscitation Based on Commonly Used Gestational Thresholds

	Chance of Survival Without Profound Impairment	Gestational Age Equivalence ^a	Management Guideline
Group 1	≥60%	≥25 wk	Resuscitation should usually be provided
Group 2	25%-50%	23-24 wk	Resuscitation should be guided by parental wishes
Group 3	≤10%	≤22 wk	Resuscitation should usually not be provided

^aGestational age equivalence refers to prognosis equivalent to an average infant born at the specified gestation.

to assess gestational age soon after birth is not necessarily any more accurate than ultrasound.^{26,52} Condition at birth is subjective and physician assessment of response to resuscitation is a poor predictor of mortality or neurodevelopmental abnormality.^{50,53} Illness severity scores in the intensive care unit are also poor predictors,⁵⁴ albeit this can be improved by incorporating other prognostic variables.⁵⁵

An individualized approach is also not necessarily at odds with moderate gestational ageism. For example, the Oregon group noted: "Our practice is participatory and individualized, . . . depending on individual clinical circumstances such as fetal gender, growth restriction, multiple fetuses, and antenatal betamethasone use."⁵⁶

Furthermore, the risk of an individualized approach is inconsistency. In the absence of clear guidelines, management decisions may vary significantly depending on which clinician happens to be on duty.² There is evidence that physician variables including personality type impact decisions to limit life-sustaining treatment in intensive care.⁵⁷ This may be the cause of the wide variability between intensive care units in the prevalence of treatment withdrawal.^{58,59}

Explicit Prognostic Strategy

An alternative that might allow more specific guidance but still take into account different variables would be a strategy based explicitly on the prognosis for survival and/or impairment. For example, a guideline could indicate that resuscitation is optional where the chance of death or impairment is greater than a certain percentage. The American Academy of Pediatrics considered and rejected such a strategy because its committee could not agree on the probability of a poor outcome that would justify decisions to limit treatment or on what counted as a poor outcome.¹⁴

But it might be possible to develop a framework for decisions based on existing consensus. One such strategy using the concept of gestational age equivalence prognosis is illustrated in the **Table**.

In the Table, survival chances are approximated from those in Figure 2, while the gestational age groups are based on common ground in published guidelines (Figure 1). The underlying idea is that if it is judged acceptable to discuss with parents the option of resuscitation in a 23- or 24-week-old infant, it should also be appropriate in an infant (or an older patient) with a different level of maturity but an equivalent prognosis. Decisions should take into account individual circumstances and local outcome data; they should be reviewed with the passage of time to ensure that they are still valid. One example might be severe growth restriction (<2nd percentile) in an infant born prior to 29 weeks' gestation, where the chance of survival (if actively treated) has been estimated as approximately 34%.⁶⁰ Such an infant would have prognosis equivalent to a 23- to 24-week-old infant and would fit into group 2 (ie, nonresuscitation or resuscitation should be offered). Another example would be an infant with congenital diaphragmatic hernia, an unfavorable lung to head ratio, and liver in the chest cavity,⁶¹ whose prognosis is approximately equivalent to a 22-week-old infant, and therefore would fit into group 3.

Arguments in favor of gestational age equivalence for treatment guidelines include greater transparency about the reasons for recommendations and greater flexibility (with the ability to incorporate multiple variables). This framework could incorporate changes in outcome over time as well as differences in prognosis in different centers or countries. It could be used for other conditions than extreme prematurity involving a similar burden of treatment and prognosis. It might also provide a basis for withdrawal of treatment based on subsequent course. On the other hand, arguments against gestational age equivalence include difficulty in reaching agreement on thresholds for decisions, the apparent arbitrariness of statistical thresholds, and difficulty in determining precise probability of death or profound impairment for individual patients.

IN DEFENSE OF (MODERATE) GESTATIONAL AGEISM

There are a number of challenges to gestational ageism. Absolute cutoffs for resuscitation (ie, strict gestational ageism) are hard to defend given uncertainty about gestational age, the influence of other factors on prognosis, and the arbitrary nature of cutoff points. Existing guidelines implicitly endorse a different ethical standard for premature newborn infants than for older children or adults.

Nevertheless, there are also several arguments in favor of gestational age-based guidelines. Gestational age is strongly associated with the risk for death, impairment, and morbidity. There is no other time of life when the chance of survival changes so dramatically and so quickly. This marks the most important difference between premature infants and the elderly. There are also particular features of decision making for extremely premature infants that support giving parents a larger role in decision making than is the norm later in life. Al-

though neonatal intensive care is cost-effective overall for extremely premature infants,⁶² routine resuscitation of the smallest and most immature infants (who have a <10% chance of survival without profound impairment) would impose substantial costs on those infants and on the community for little benefit.¹⁰ Finally, the alternatives to gestational ageism also have their problems. Individualizing treatment decisions is entirely laudable, but in the absence of a framework for decisions, risks inconsistency. It is also compatible with gestational age frameworks. The most transparent and flexible approach to guidelines would be an explicit prognostic strategy for withholding or withdrawing treatment, perhaps drawing on the concept of gestational age equivalence, as just described (Table). Nevertheless, there are challenges in the development of such a framework and in its implementation.

Gestational age-based guidelines are not without their problems. Many of those problems are shared with attempts to define when resuscitation should be provided for older patients.⁶³ In both groups, age is appropriate to consider with other factors, and moderate forms of ageism may be justified. Indeed, age should be taken into account in prognosis and decisions about treatment wherever it can be shown to have independent predictive power. However, age-based algorithms for cardiopulmonary resuscitation in elderly patients are unlikely to be incorporated into policies. In contrast, gestational age-based guidelines are arguably the best available way of providing a structure for those involved in perinatal decision making, setting out the boundaries of appropriate care, and supporting parents and clinicians facing extremely difficult choices.

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