ever, identifiable subgroups of patients admitted to ICUs who will not survive, and these patients can often be identified early in their ICU course.\(^6\) It is likely that DNR orders are being underutilized for these subgroups in some ICUs.

A crucial feature of DNR orders is physician-patient communication. It is unfortunate that patients are frequently incompetent when DNR decisions are made,\(^9\) since it appears clear that physicians and patients' spouses are not always accurate judges of patients' resuscitation preferences.\(^{10}\) Regardless of whether the patient or his or her family is making a DNR decision, physicians should be skillful and sensitive in communicating both medical and less technical information during this stressful period. For these communication sessions, it is important to allow sufficient time, to choose a quiet and protected location, and to establish a warm and nurturing environment. It is vital to ensure that messages are clear, both by keeping conversations simple and by asking whether your message was understood.\(^{11}\) We also believe a two-question format in DNR discussions is warranted.\(^{11}\)

**Question 1:** “Would you want to be resuscitated in the event of cardiopulmonary arrest?”

This first question is preferably raised when the patient is not critically ill and is competent. Only a minority of outpatients have their DNR status determined before hospital admission; therefore, the question is often asked early in the hospital course. Most patients who are asked will want CPR performed, in which case a second question should be raised.

**Question 2:** “Let us assume you were resuscitated. If the critical care team, despite doing everything they can to save your life, determine after 72 hours that you have in essence no chance to regain a reasonable quality of life, would you agree to let them withdraw support to let you die with peace and dignity?”

Although no study data exist, we believe from our experience that most patients who choose to be resuscitated will choose not to have their life prolonged if there is no reasonable chance to recapture a meaningful quality of life. For both questions, patients should be encouraged to discuss their feelings and decisions with their families and to have their resuscitation preferences documented. If this occurs, fewer problems will arise between surrogates and healthcare team members if the patient becomes legally incompetent.

Parker et al have contributed to a growing body of knowledge about the use of DNR orders in ICUs. Survival from CPR performed in ICUs is poor. In most instances, it is difficult to accurately predict outcome of individual patients admitted to ICUs. The importance of discussing and documenting resuscitation preferences is paramount. The use of our two-question format can be helpful when discussing DNR orders with patients or their surrogates. Currently, too few DNR orders are written in the ICU.

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**References**


**Bronchoprovocation Challenge**

**A Clinical Test Whose Time Has Come**

Bronchoprovocation challenge (BPC) has been an important epidemiologic and clinical research tool\(^1\) used to demonstrate bronchial hyperresponsiveness. Its origins date back to 1921, when Alexander and Paddock\(^2\) showed that pilocarpine induced asthmatic symptoms in subjects with asthma. Aerosol bronchoprovocation techniques were developed in 1947,\(^3\) but standardization was not realized until 1975, when Chai et al\(^4\) formulated protocols for methacholine, histamine, and antigen challenge.

Subsequently, the literature began to show a variety of uses of BPC. These include evaluating patients with occult cough or dyspnea, demonstrating the effective-
ness of new drugs in blocking bronchial hyperresponsiveness, predicting the severity of asthma, screening subjects due to be employed in occupations with a high incidence of occupation-induced asthma, and, in epidemiologic studies, investigating the role of hyperreactive airways in COPD and its relationship to the decline in pulmonary function test results over time. Some authorities also feel that BPC demonstrating bronchial hyperresponsiveness should be included in the definition of asthma.

Despite a great deal of positive data supporting the usefulness of BPC and confirming the diagnosis of bronchial asthma, BPC has not been done in many pulmonary function testing laboratories because of the potential cost of equipment, the time required to do the test, and, most important, the question of safety. There are few, if any, pulmonary function laboratories outside hospitals that perform BPC.

In this edition of Chest, Bartter, Dubois and Pratter present two studies that clearly show the ease of doing BPC with methacholine and the safety associated with the testing. In their first article (see page 1338), where they look at the role of saline solution inhalation in BPC, using a technique popularized by Hargreave et al., the investigators show that the initial testing protocol using aerosolized diluent (normal saline solution) to preface BPC is not necessary. There were no cases defined with a drop in baseline FEV, of 20 percent or more after inhalation of saline solution diluent, nor were any of the 4 subjects with a drop in FEV, of 10 percent or more found to be marked hyperresponders. Eliminating this unnecessary step shortens the time to perform the testing protocol.

In their second article (see page 1342), the authors show that each of their subjects with a positive test (i.e., each hyperresponder to methacholine) reversed his postinhalation challenge FEV, to within 10 percent of the baseline value with the inhalation of albuterol via metered-dose inhaler delivered with a spacer. In addition, while there was a definite increase in cough and dyspnea in their responders after BPC, these symptoms were easily reversed with the administration of albuterol given via metered-dose inhaler.

It is important to realize that these data apply only to inhalation challenges done with methacholine. While it is reasonable to believe that similar data would accompany histamine challenge, it has not been studied in the same prospective manner. It is also important to emphasize that all these patients were prescreened with a questionnaire or were evaluated by one of the authors, none was pregnant, and no patient with "known" asthma was studied. All had to demonstrate a normal baseline FEV, /FVC x 100% prior to testing. This last point, namely, normal baseline spirometry, is a very important predictor of a "safe" BPC.

These data parallel observations made in over 15 years of experience in thousands of patients tested with methacholine in our clinical laboratory. In only one instance, in the clinical research laboratory, did a ß2-agonist administered via metered-dose inhaler fail to reverse a methacholine-induced drop in the FEV,.

In our clinical pulmonary function testing laboratory, all patients must have a normal baseline FEV, /FVC or inhalation challenge is not performed routinely.

The safety profile of other types of BPC has not been studied prospectively. In fact, some challenges must be done only in a well-equipped hospital-based pulmonary function laboratory with a physician in attendance. These studies include antigen, aspirin, metabisulfitie, and specific occupational substance challenges, where changes in pulmonary function studies are often delayed and very unpredictable.

Detecting nonspecific bronchial hyperresponsiveness is a useful tool when the diagnosis of asthma cannot be confirmed by typical findings of wheezing and reversible airflow obstruction. Bronchoprovocation challenge with methacholine, the most sensitive nonspecific bronchoconstrictor, can be done safely, inexpensively, and in a timely fashion in any pulmonary function laboratory, even those associated with a private office, assuming that the technical expertise to do the test properly is available.

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