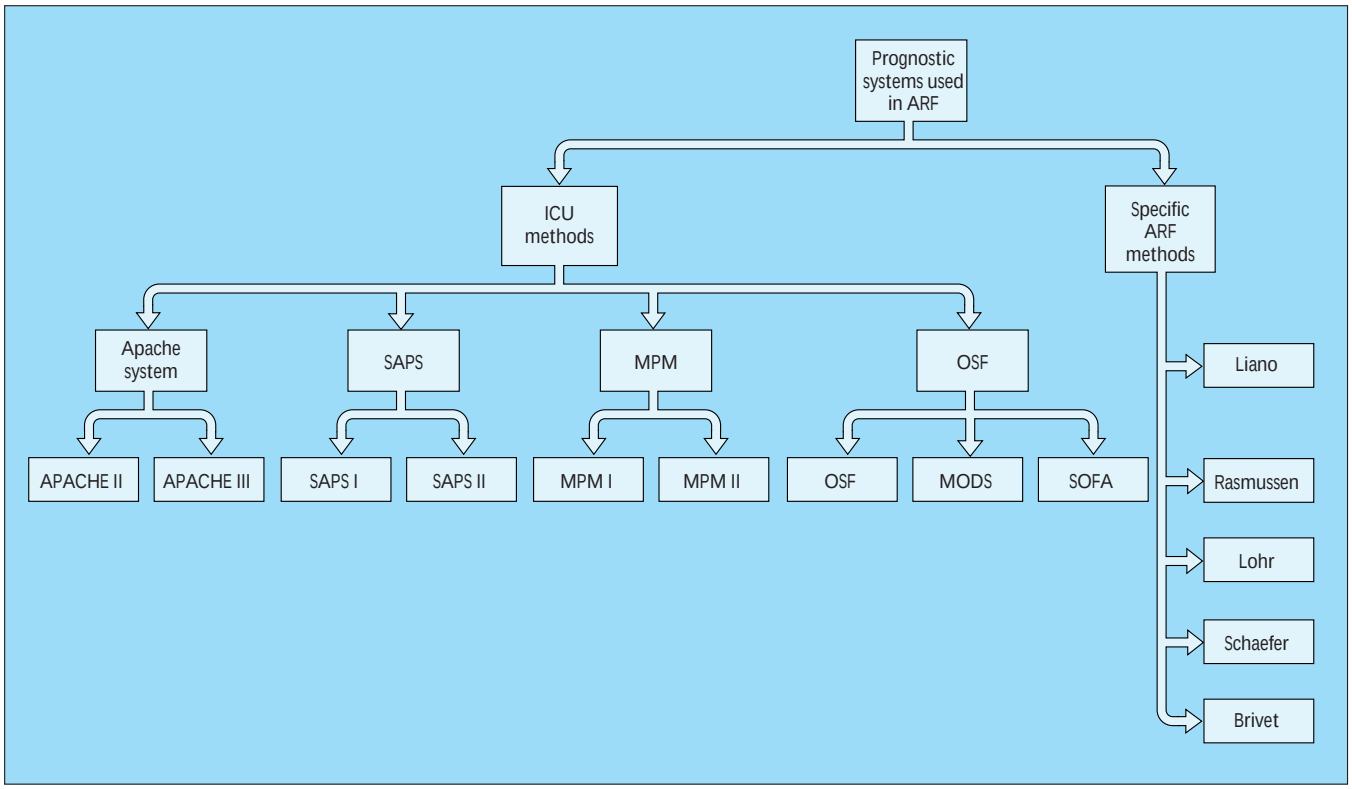

FIGURE 8-24

Ways of estimating prognosis in acute renal failure (ARF). This can be done using either general intensive care unit (ICU) score systems or methods developed specifically for ARF patients. ICU systems include Acute Physiological and Chronic Health Evaluation (APACHE) [21,22], Simplified Physiologic Score (SAPS)[23,24], Mortality Prediction Model (MPM) [25,26], and Organ System Failure scores (OSF) [27]. Multiple Organ Dysfunction Score (MODS) [28] and Sepsis-Related Organ Failure Assessment Score (SOFA) [29] are those that seem most suitable for this purpose. APACHE II used to be most used. Other systems (white boxes) have been used in ARF. On the other hand, at least 17 specific ARF prognostic methods have been developed [20,30]. The figure shows only those that have been used after their publication [31], plus one recently published system which is not yet in general use [2].

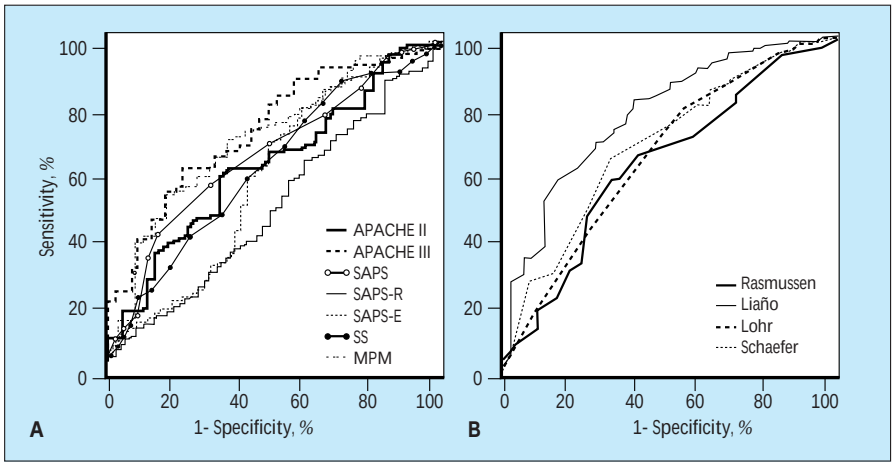

FIGURE 8-25

Comparison of prognostic methods for acute renal failure (ARF) by ROC curve analysis [31]. A method is better when its ROC-curve moves to the upper left square determined by the sensitivity and the reciprocal of the specificity. **A**, ROC curves of seven prognostic methods usually employed in the ICU setting. The best curve comes from the APACHE III method, which has an area under the ROC curve of 0.74 ± 0.04 (SE). **B**, Four ROC curves corresponding to prognostic methods specifically developed for ARF patients are depicted. The best curve in this panel comes from the Liaño method for ARF prognosis. Its area under the curve is 0.78 ± 0.03 (SE). APACHE—Acute Physiology and Chronic Health Evaluation, (II second version [21]; III third version [22]); SAPS—Simplified Acute Physiology Score [23]; SAPS-R—SAPS-reduced [33]; SAPS-E—SAPS-Extended [32]; SS—Sickness Score [33]; MPM—Mortality Prediction Model [25]; ROC curve—Receiving Operating Characteristic curve; SE—Standard Error. (*From* Douma [31]; with permission.)

ACUTE RENAL FAILURE: VARIABLES STUDIED WITH UNIVARIATE ANALYSIS

Age	Hypotension
Jaundice	Catabolism
Sepsis	Hemolysis
Burns	Hepatic disease
Trauma	Kind of surgery
NSAIDs	Hyperkalemia
BUN increments	Need for dialysis
Coma	Assisted respiration
Oliguria	Site of war injuries
Obstetric origin	Disseminated intravascular coagulopathy
Malignancies	Pancreatitis
Cardiovascular disease	Antibiotics
X-ray contrast agents	Timing of treatment
Acidosis	

FIGURE 8-26

Individual factors that have been associated with acute renal failure (ARF) outcome. Most of these innumerable variables have been related to an adverse outcome, whereas few (nephrotoxicity as a cause of ARF and early treatment) have been associated with more favorable prognosis. For a deep review of variables studied with univariate statistical analysis [34, 35]. NSAID—nonsteroidal anti-inflammatory drugs; BUN—blood urea nitrogen.

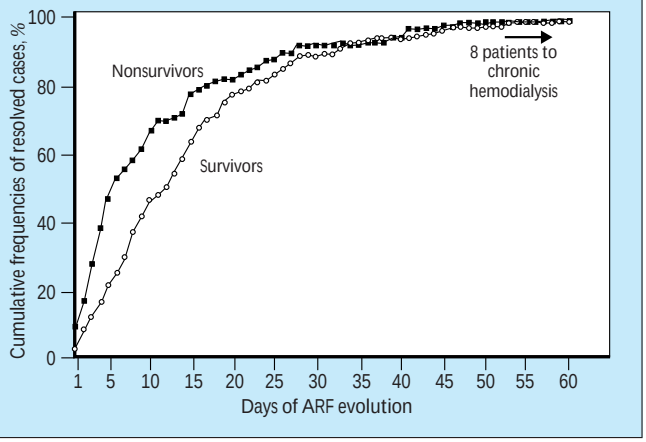

FIGURE 8-27

Duration and resolution of acute renal failure (ARF). Most of the episodes of ARF resolved in the first month of evolution. Mean duration of ARF was 14 days. Seventy-eight percent of the patients with ARF who died did so within 2 weeks after the renal insult. Similarly, 60% of survivors had recovered renal function at that time. After 30 days, 90% of the patients had had a final resolution of the ARF episode, one way or the other. Patients who finally lost renal function and needed to be included in a chronic periodic dialysis program usually had severe forms of glomerulonephritis, vasculitis, or systemic disease. (*From* Liaño *et al.* [1]; with permission.)

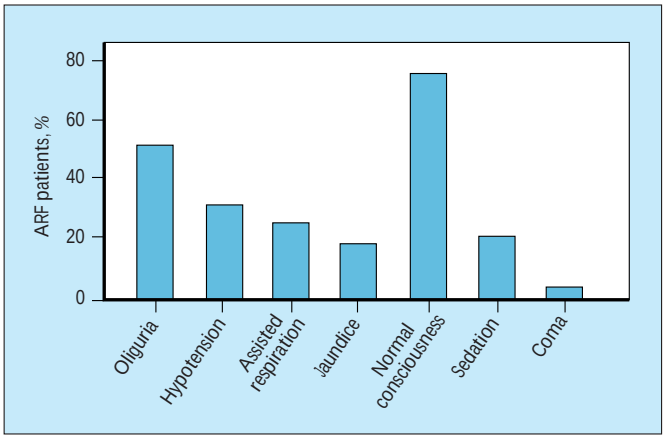

FIGURE 8-28

Precipitating condition of acute renal failure (ARF). The initial clinical condition observed in ARF patients is shown. *Oliguria*: urine output of less than 400 mL per day; *hypotension*: systolic blood pressure lower than 100 mm Hg for at least 10 hours per day independent of the use of vasoactive drugs; *jaundice*: serum bilirubin level higher than 2 mg/dL; *coma*: Glasgow coma score of 5 or less. The presence of these factors is associated with poorer outcome (*see* Fig. 8-29). (*Data from* Liaño *et al.* [1].)

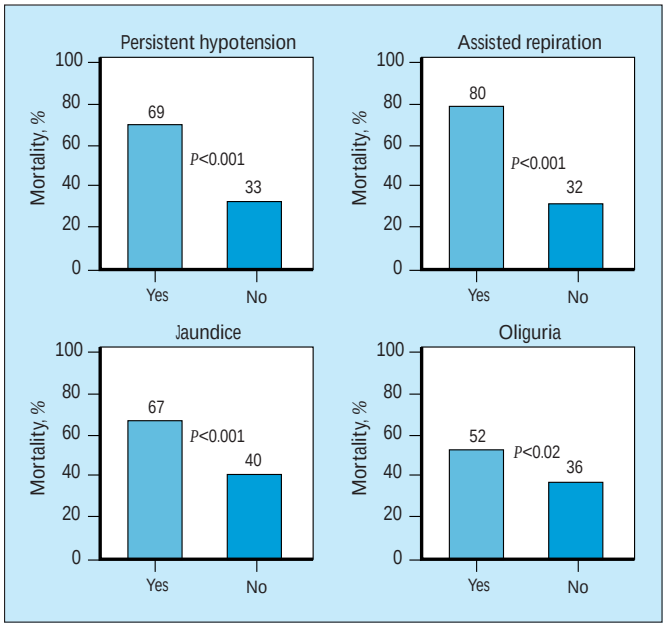

FIGURE 8-29

Mortality associated with the presence or absence of oliguria, persistent hypotension, assisted respiration and jaundice (as defined in Fig. 8-28). The presence of an unfavorable factor was significantly associated with higher mortality. (*Data from* Liaño *et al.* [1].)

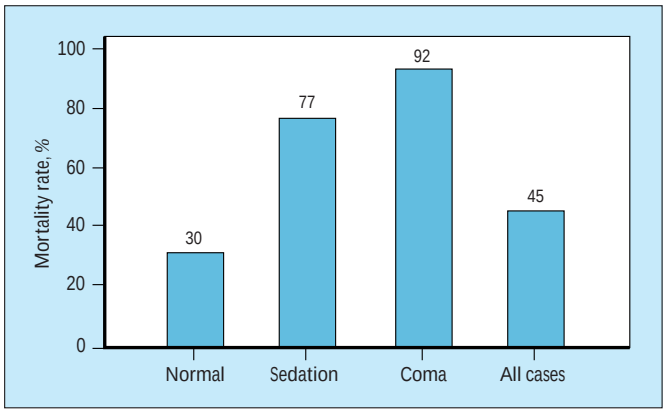

FIGURE 8-30

Consciousness level and mortality. Coma patients had a Glasgow coma score of 5 or lower. *Sedation* refers to the use of this kind of treatment, primarily in patients with assisted respiration. Both situations are associated with significantly higher mortality ($P<0.001$) than that observed in either patients with a normal consciousness level or the total population. (*Data from* Liaño *et al.* [1].)

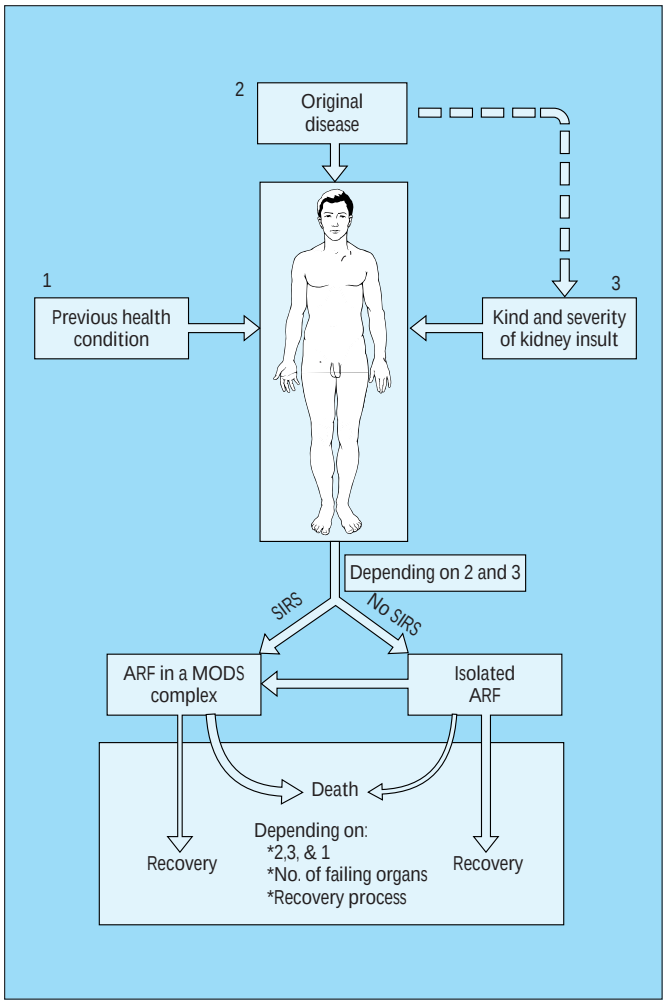

FIGURE 8-31

Outcome of acute renal failure (ARF). Two groups of factors play a role on ARF outcome. The first includes factors that affect the patient: 1) previous health condition; 2) initial disease—usually, the direct or indirect (*eg*, treatments) cause of kidney failure; 3) the kind and severity of kidney injury. While 1 is a conditioning element, 2 and 3 trigger the second group of factors: the response of the patient to the insult. If this response includes a systemic inflammatory response syndrome (SIRS) like that usually seen in intensive care patients (*eg*, sepsis, pancreatitis, burns), a multiple organ dysfunction syndrome (MODS) frequently appears and consequently outcome is associated with a higher fatality rate (*thick line*). On the contrary, if SIRS does not develop and isolated ARF predominates, death (*thin line, right*) is less frequent than survival (*thick line*).