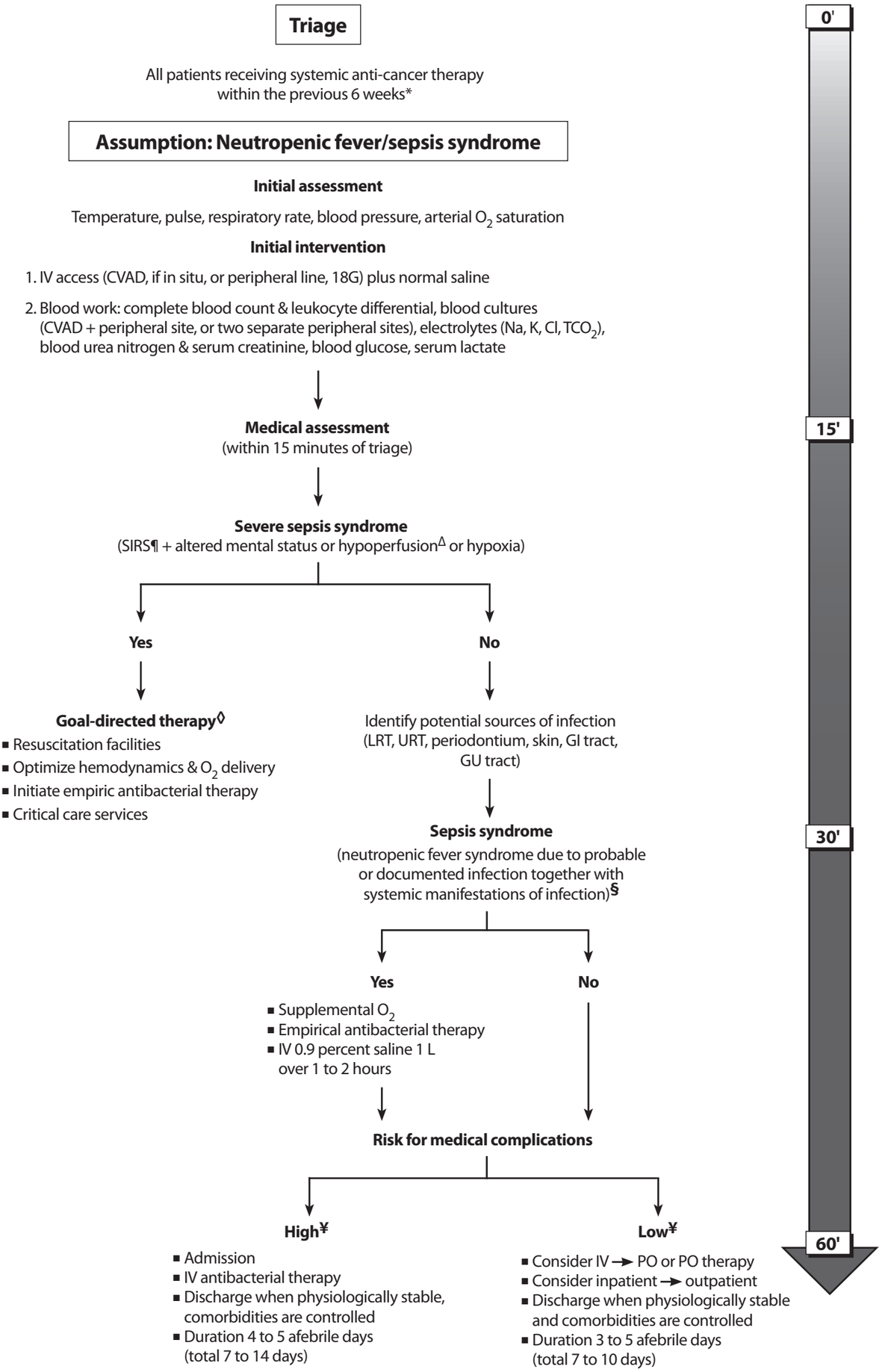
Time-dependent algorithm for the initial assessment and management of cancer patients with neutropenic fever and suspected sepsis syndrome



CVAD: central venous access device; Na: sodium; K: potassium; Cl: chloride; TCO_2: total carbon dioxide; SIRS: systemic inflammatory response syndrome; LRT: lower respiratory tract; URT: upper respiratory tract; GI: gastrointestinal tract; GU: genitourinary tract; O_2: oxygen; IV: intravenous; MASCC: Multinational Association for Supportive Care in Cancer; PO: per os (by mouth).

* The Northern Ireland Cancer Network states that neutropenic sepsis is a "time-dependent" condition, the successful management of which is dependent upon the early recognition of the likelihood that the cancer patient's problem represents a neutropenic fever/sepsis syndrome[1]. Since more than 70 percent of cancer treatment-related syndromes, including neutropenic fever, manifest within four to six weeks of systemic treatment[2], the Northern Ireland Cancer Network has recommended a history of chemotherapy within the past six weeks as a sensitive discriminator to detect patients with neutropenic fever/sepsis syndromes by triage services in health care facilities[1].

¶ SIRS is a clinical syndrome that is a form of dysregulated inflammation. The term SIRS has routinely been associated with both infectious processes (sepsis) and noninfectious insults, such as an autoimmune disorder, pancreatitis, vasculitis, thromboembolism, burns, or surgery. SIRS was previously defined as two or more abnormalities in temperature, heart rate, respiration, or white blood cell count[3]. However, in practice, its clinical definition and pathophysiology are nonequivocal such that SIRS and early sepsis cannot be readily distinguished. Thus, when SIRS is suspected, it should prompt an evaluation for a septic focus.

Δ Hypoperfusion is defined by hypotension persisting after initial fluid challenge or blood lactate concentration ≥4 mmol/L[4]. Refer to the UpToDate topic on the definition of sepsis and SIRS for additional details.

◊ Goal-directed therapy for initial resuscitation includes the following: (a) central venous pressure 8 to 12 mmHg; (b) mean arterial pressure ≥65 mmHg; (c) urine output ≥0.5 mL/kg per hour; and (d) central venous (superior vena cava) oxygen saturation ≥70 percent or mixed venous oxygen saturation ≥65 percent[4]. Refer to the UpToDate topic on evaluation and management of sepsis for additional details.

§ Sepsis is defined as the presence (probable or documented) of infection together with systemic manifestations of infection (eg, temperature >38.3 or <36°C, heart rate >90 beats/minute, respiratory rate >20 breaths/minute, altered mental status, leukocytosis, arterial hypotension, arterial hypoxemia)[4]. Refer to the UpToDate topic on the definition of sepsis and SIRS for the full diagnostic criteria for sepsis.

¥ Patients at low risk for serious complications are defined as those who are expected to be neutropenic (absolute neutrophil count [ANC] <500 cells/microL) for ≤7 days and those with no comorbidities or evidence of significant hepatic or renal dysfunction. High-risk patients are defined as those who are expected to be neutropenic (ANC <500 cells/microL) for >7 days; patients with neutropenic fever who have ongoing comorbidities or evidence of significant hepatic or renal dysfunction are also considered to be high risk, regardless of the duration of neutropenia. The Multinational Association for Supportive Care in Cancer (MASCC) risk index can also be used for determining risk. A MASCC score of ≥21 predicts a low risk for medical complications of neutropenic fever syndromes that would require hospitalization and/or prolonged length of hospitalization. A score of <21 predicts patients at high risk for such complications[5]. Refer to the text for more details regarding the definitions of low- and high-risk patients based upon clinical criteria and the MASCC risk score.

References:

1. Bell MS, Scullen P, McParlan D, et al. Neutropenic Sepsis Guideline. In Edition Northern Ireland Cancer Network 2010; 1-11.

2. McKenzie H, Hayes L, White K, et al. Chemotherapy outpatients' unplanned presentations to hospital: a retrospective study. Support Care Cancer 2011; 19:963-969.

3. Levy MM, Fink MP, Marshall JC, et al. 2001 SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definitions Conference. Intensive Care Med 2003; 29:530.

4. Dellinger RP, Levy MM, Rhodes A, et al. Surviving sepsis campaign: international guidelines for management of severe sepsis and septic shock: 2012. Crit Care Med 2013; 41:580.

5. Klastersky J, Paesmans M, Rubenstein EB, et al. The Multinational Association for Supportive Care in Cancer risk index: A multinational scoring system for identifying low-risk febrile neutropenic cancer patients. J Clin Oncol. 2000; 18:3038-3051.