

A Charming Model: New Tool Evaluates Risk of Stem Cell Transplant for Older Patients

CHARM is a calculator that evaluates seven variables to determine whether transplantation is a good option for patients older than 60.

December 11, 2024 By Fred Hutch Cancer Center

A new risk assessment model developed by investigators from the [Blood & Marrow Transplant Clinical Trials Network](#) (BMT CTN) will be presented by Fred Hutch Cancer Center transplant doctor [Mohamed Sorrow, MD, MSc](#), at the American Society of Hematology's 2024 Annual Meeting in San Diego.

The Composite Health Risk Assessment model, or [CHARM](#), was designed to evaluate risks of mortality unrelated to relapse for older patients who may benefit from hematopoietic stem cell transplants. Sorrow, a professor in Fred Hutch's Clinical Research Division, will discuss how this new model can inform patients about their risks of transplant-related problems, helping physicians evaluate treatment options and improve care for older patients.

CHARM is a [calculator](#) that evaluates seven variables to determine whether transplant is a good option for patients older than 60.

"This model allows us to tell the patient, 'Your CHARM score is so and so and based on that, here is your chance of survival, here are the benefits of transplant and here are the risks,'" Sorrow said. "It helps the patient be better prepared and better informed so they can determine if they put all these variables together, is transplant worth it?"

Sorrow and colleagues lay out the methodology in a paper, [The Composite Health Risk Assessment Model \(CHARM\) Predicts Risks of Toxicities, Functional and Cognitive Decline Among Survivors of Allogeneic Hematopoietic Cell Transplantation \(allo-HCT\)](#).

In 2013, the BMT CTN convened a State of the Science symposium to discuss potential future research projects. On the subject of transplant toxicity, participants noted the existence of an important tool to assess downstream health risks to patients after transplant: the hematopoietic cell transplantation (HCT)-specific comorbidity index, or HCT-CI, which [Sorrow and colleagues pioneered](#).

Sorrer described the index as “one brick in a wall” and short on detail. So he began working on developing new and improved metrics, particularly for older patients, a cohort that is increasingly being offered the option of transplant.

“As the number of older patients getting transplants keeps going up, we have a responsibility to improve and expand on the models,” said Sorrer. “In older populations, there is a lot of emphasis on not just mortality but morbidity — quality of life, walk tests, psychological assessments. So why don’t we collect all that information and build a better model focused only on older patients?”

During monthly meetings that started in 2017, Sorrer and colleagues identified 13 different values that could be useful in evaluating transplant outcomes. CHARM includes all the assessments from HCT-CI plus additional calculations to help determine how likely a patient is to survive and benefit from a transplant, considering the risks of the procedure and their unique individual patient profile.

New model CHARM helps assess transplant survival and benefits

They built various models using statistical analysis including machine learning and AI, which allowed them to settle on seven values that are most important to assess: increasing age, higher HCT-CI scores, lower albumin, higher C-reactive protein, higher percent of weight loss over the preceding year, lower patient-reported performance status scores and lower cognitive score per Montreal cognitive assessment (MoCA).

Sorrer’s ASH presentation will emphasize how this model affects other important post-transplant outcomes such as cognitive impairment, physical health and the development of graft-vs.-host disease.

CHARM is the result of two major studies: one that validates prediction for morbidity and mortality, which was presented at ASH in 2023, and one that predicts other outcomes. A manuscript is in progress for the second arm of the study; the manuscript for the first arm has been submitted for publication, which is how providers nationwide will learn about the metrics and be able to incorporate CHARM into their practice. Sorrer and colleagues are working to make sure cancer centers know about CHARM and [use the index](#) in their clinics.

The research enrolled patients between the ages of 60 to 82.

“This model will help us discuss with each patient what are the risks and what they can expect moving forward,” he said. “Some of the values might be different for an 80 year old than for a 60 year old, and there may be differences in the importance that people place on these values. CHARM can tell everyone what to expect so they can make the most informed decision about whether they should move ahead and if they do, what they should be prepared for.”

One of the main benefits of both studies is that rates of referral of older patients for transplant could rise. Previously, physicians may have been reluctant to refer older patients for transplant as relying on age alone can correlate with poor prognosis.

Sorrer [presented his abstract,

[The Composite Health Risk Assessment Model \(CHARM\) Predicts Risks of Toxicities, Functional and Cognitive Decline Among Survivors of Allogeneic Hematopoietic Cell Transplantation \(allo-HCT\): A Prospective BMT-CTN Study 1704](#), on [December 8].

He is one of about 60 Fred Hutch [clinicians and researchers presenting at ASH](#).

Click here for more news from [ASH 2024](#).

© 2026 Smart + Strong All Rights Reserved.

<http://beta.docker.cancerhealth.com/article/charming-model-new-tool-evaluates-risk-stem-cell-transplant-older-patients>