

BCG Immunotherapy

BCG (bacillus Calmette-Guerin) immunotherapy is a major advance in the treatment of superficial bladder cancer, responsible for significantly reducing bladder cancer recurrence and progression. It has proven to be more effective than chemotherapy instilled directly into the urinary bladder. The bacillus Calmette-Guerin vaccine (BCG) was developed in 1921 as a live, attenuated (weakened) vaccine for tuberculosis. Today, it is recognized as the most effective treatment for high-grade, superficial bladder cancer and carcinoma-in-situ (CIS), a flat but high-grader cancer of the urothelium.

Albert Calmette and Camille Guerin “tamed” the bovine (cow) tuberculosis bacterium while working at the Pasteur Institute in Lille, France. This weakened product was called BCG. It was initially recognized as an effective vaccine for tuberculosis. In 1929, it was discovered that BCG might also have a role in the treatment of cancer, when autopsy findings in TB patients were correlated with a reduced prevalence of cancer.

In 1976, Alvaro Morales devised the original BCG immunotherapy regimen for bladder cancer. The current regimen used is two 6-week courses of intra-vesical (instilled directly within the urinary bladder) BCG, beginning two weeks or so following the bladder tumor resection, followed by maintenance therapy.

An adequate response to BCG immunotherapy requires infusing a sufficient number of viable colony-forming units of BCG in direct contact with cancer cells into a patient with an immune system capable of mounting a cellular immune response. Low-grade fever, irritative lower urinary tract symptoms, and the presence of white blood cells in the urine are often indicative of such an immune response.

Avoidance of drinking fluids for at least 2 hours prior to bladder instillation and avoidance of caffeine-containing products for at least 4 hours prior to bladder instillation is prudent in order to be able to retain the BCG for the full 2 hours and to avoid diluting the concentration of the BCG. BCG is placed inside the urinary bladder using a small caliber catheter. Retaining it for two hours is ideal; rotating body position is important so that all areas of the bladder are adequately bathed with the BCG. Care should be used when urinating after the BCG is instilled to avoid contaminating the hands or genitals with the BCG. Men should sit to void to reduce the likelihood of self-contamination. Hands and genitals should be washed thoroughly afterwards, and household bleach should be added to the toilet immediately after urination. The bleach should stand for 15 minutes before flushing to deactivate the BCG.

Minor side effects are common with BCG, especially irritative lower urinary tract symptoms including burning with urination, painful or difficult urination, urgency, frequency, incomplete emptying, and blood in the urine. Occasionally, flu-like symptoms may occur, including fever, chills, cough, muscle and joint aches. When severe symptoms have resulted from previous BCG administrations, BCG concentration can be reduced to 1/3, 1/10, 1/30, or even 1/100th of a dose to prevent escalating side effects.