

### Transcript Details

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### MS: A Progressive Disease From the Start

#### Announcer:

Multiple Sclerosis (MS) is a chronic inflammatory and neurodegenerative disease of the central nervous system, or CNS.<sup>1,2</sup>

Although the exact cause of MS is not clear<sup>1</sup>, the pathogenic process involves the lymph nodes where T and B cells interact, initially outside the CNS, and later probably also in follicles inside the CNS.<sup>1</sup>

B cells are critical for mounting healthy immune responses. They release cytokines to protect the body from infection, produce antibodies to capture and eliminate antigens, and present antigens to T cells.<sup>3</sup> When T cells encounter B cells presenting antigen in the lymph node, T-cell differentiation and proliferation are triggered.<sup>4</sup>

In people with MS, B cells capture auto-antigens derived from neurons or their myelin sheaths and present peptides they generate from these auto-antigens to T cells within the lymph nodes, thereby promoting activation of pathogenic (encephalitogenic) T cells.<sup>4</sup> In other words, B cells direct T cells to attack the body's CNS tissue.<sup>3</sup>

Homing signals—much like a GPS—help these autoreactive B cells and T cells navigate to the CNS, where they drive inflammation that damages the brain and/or spinal cord by inducing de-myelination, axonal damage and impaired transmission of nerve impulses.<sup>4,5</sup> B cells may also produce pathogenic antibodies that contribute to the development of MS.<sup>3</sup>

MS is often characterized by relapses, disability progression, lesions and grey and white matter damage.<sup>6</sup>

Every person's MS journey is unique, but many diagnosed with relapsing-remitting MS advance to secondary progressive MS, or SPMS.<sup>7,8</sup>

Inflammation and neurodegeneration damage myelin and axons from the start, though compensatory repair mechanisms may mask the initial clinical signs of this damage, making it difficult to identify progression early.<sup>6,9-12</sup>

In relapsing-remitting MS, progression occurs alongside relapses,<sup>11</sup> driven by peripheral inflammation and lymphocyte infiltration of the CNS.<sup>10,13</sup>

As MS progresses, central inflammation and neurodegeneration become more prominent; compensatory repair mechanisms become exhausted and irreversible gray and white matter damage occurs.<sup>6,11,14</sup>

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