The fluid percussion injury (FPI) model is an experimental method used in neuroscience research to produce traumatic brain injury (TBI) in animals. This model involves creating a sudden increase in intracranial pressure by delivering a fluid pulse to the surface of the brain.

To perform the FPI model, a small craniotomy is made in the skull of an anesthetized animal, and a cannula is inserted through the hole and attached to a fluid reservoir. A pulse of fluid is then delivered to the brain by rapidly pressurizing the reservoir, which creates a brief, high-pressure pulse that is transmitted through the fluid and into the brain tissue.

The FPI model has been used extensively in research to study the pathophysiology of TBI and to evaluate potential treatments for the condition. The model produces a consistent and reproducible injury, and can be used to study various aspects of TBI, including changes in brain structure and function, neuroinflammation, and cognitive and behavioral deficits.

However, it is important to note that the FPI model has limitations, as it does not completely replicate the complex biomechanics of human TBI. Therefore, caution should be exercised when interpreting the results of FPI studies, and findings should be validated using other models of TBI, such as the controlled cortical impact model or the weight drop model.

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