

ARTICLES

Throwing while looking through prisms. I. Focal olivocerebellar lesions impair adaptation

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Normal human subjects and patients with lesions of the olivocerebellar system threw balls of clay at a visual target while wearing wedge prism spectacles. Normal subjects initially threw in the direction of prism- bent gaze, but with repeated throws adapted to hit the target. Patients with generalized cerebellar atrophy, inferior olive hypertrophy, or focal infarcts in the distribution of the posterior inferior cerebellar artery, in the ipsilateral inferior peduncle, in the contralateral basal pons or in the ipsilateral middle cerebellar peduncle had impaired or absent prism adaptation. Patients with infarcts in the distribution of the posterior inferior cerebellar artery usually had impaired or absent adaptation but little or no ataxia. By contrast, patients with damage in the distribution of the superior cerebellar artery or in cerebellar thalamus usually had ataxia but preserved adaptation. These results implicate climbing fibres from the contralateral inferior olive via the ipsilateral inferior cerebellar peduncle, mossy fibres from the contralateral pontocerebellar nuclei via the ipsilateral middle cerebellar peduncle, and posterior inferior cerebellar artery territory cortex as being critical for this adaptation. The

dentatothalamic projection and the superior cerebellar artery territory cortex are not necessary for this adaptation.