Stroke events in EU countries are estimated to increase by 30% by 2025. The most common deficit is contralateral upper limb hemiparesis, affecting over 80% acutely and 40% chronically. This causes motor impairments like weakness, contracture, and impaired control, leading to disabilities in daily activities such as reaching and gripping. Associated neurological issues include somatic sensory deficits (11–85% prevalence), which impede sensory detection, disturb motor tasks, and diminish rehabilitation outcomes, impacting safety. Up to 50% of patients experience upper extremity pain in the first year, particularly shoulder pain or CRPS–type I, hindering early rehabilitation; joint subluxation and contractures also cause pain. Neglect syndrome and spasticity further affect functional outcomes. Neurological recovery follows a nonlinear, logarithmic pattern, with most occurring within the first three months, but continuing for many years. Recovery combines spontaneous and learning–dependent processes like restitution, substitution, and compensation. Spontaneous recovery in the initial three months can confound rehabilitation. While some once believed recovery was intrinsic, improvements after three months primarily depend on learning adaptation strategies. Evidence shows neurological repair via brain reorganization, supporting true recovery or compensation, continues into subacute and chronic phases, with initial contralesional activation shifts.

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