

Non-neutral Posture Guidelines

The following table summarizes postural angles at which non-neutral postures are identified for specific body parts and relevant motions.

Body Part	Motion	Non-Neutral Posture Angle	Reference
Back	Flexion	>30°	Hoogendoorn, W.E., Bongers, P.M., de Vet, H.C.W., Douwes, M., Koes, B.W., Miedema, M.C., Ariëns, G.A.M, Bouter, L.M. (2000)
	Extension	>10°	MSD Prevention Toolbox (Part 3B) - Beyond the Basics
	Rotation/Lateral Bend	>30°	MSD Prevention Toolbox (Part 3B) - Beyond the Basics
Neck	Flexion	>30°	Chaffin, D.B., Andersson, G.B.J., Martin, B.J. (2006); Chaffin (1973)
	Extension	>20°	Martin, D.K. and Dain, S.J. (1988)
	Rotation/Lateral Bend	>45°	Van den Heuvel, S.G., van der Beek, A.J., Blater, B.M., Bongers, P.M. (2006)
Shoulder	Flexion	>60°	NIOSH (1997)
	Extension*	>10°	Kilbom, Å., Persson, J. (1987)
	Abduction	>60°	NIOSH (1997); Ohlsson, K., Attewell, R., Paison, B., Karlsson, B., Balogh, I., Johnsson, B., Ahlm, A., Skerfving, S. (1995)
Elbow	Flexion ⁺	<45°	Mukhopadhyay, P., O'Sullivan, L., Gallwey, T.J. (2007)
	Extension ⁺	>120°	Grandjean, E. (1980); Tichauer, E.R. (1966)
	Pronation/Supination*	>45°	Mukhopadhyay, P., O'Sullivan, L., Gallwey, T.J. (2007); O'Sullivan, L.W. and Gallwey, T.J. (2005); Tanak, S., Peteresen, M., Cameron, L. (2001)
Wrist	Flexion	>45°	Carey, E. J., & Gallwey, T. J. (2002); Keir, P.J., Wells, R.P., Lavery, W. (1997); Loslever, P. & Ranaivosoa, A. (1993); Skie, M., Zeiss, J., Ebraheim, N.A., Jackson, W.T. (1990)
	Extension	>30°	Keir, P.J., Bach, J.M., Hudes, M., Rempel, D.M. (2007); Keir, P.J., Wells, R.P., Lavery, W. (1997)
	Ulnar/Radial Deviation	>20°	Hünting, W., Läubli, T., Grandjean, E. (1981); Keir, P.J., Bach, J.M., Hudes, M., Rempel, D.M. (2007).
Knee	Flexion	>90°	Chengalur, S.N., Rodgers, S.H., Bernard, T.E. (The Eastman Kodak Company) (2004)

* Indicates that a specific posture angle has not been identified in the literature. Findings in the referenced articles support that these motions increase risk of discomfort and/or musculoskeletal injury.

⁺ Posture angle is in reference to the inner (included) elbow angle.

These parameters were derived using references from the literature. For complete citations of references provided, please refer to 'Non-neutral Posture Literature Review - May 2010' document found on the Options Inc. SharePoint website.