Value stream mapping (VSM) is a lean tool aiming at waste reduction. Previous research suggests that the use of VSM may result in work intensification and thus an increased risk for the workers of developing work-related musculoskeletal disorders (MSD). In the current study, VSM was developed to also consider physical exposure in the analyzed production system (ErgoVSM). As the VSM, ErgoVSM is based on a participatory approach. ErgoVSM was tested in a Swedish manufacturing company. The results suggest that ErgoVSM catalyzes change processes to include intervention proposals emphasizing ergonomics in addition to waste reduction. Thus, ErgoVSM appeared useful for the investigated target group of production engineers and experienced operators. The performance improvements suggested when using the ordinary VSM seemed not to be hampered by adding the ergonomics complement. However, the use of ErgoVSM was somewhat more time consuming than the use of VSM. In conclusion, ErgoVSM is suggested as a feasible tool to be used by production engineers and experienced operators for including ergonomics considerations in the rationalization process. © 2015 Wiley Periodicals, Inc.