

# Metodo OCRA: aggiornamento dei valori di riferimento e dei modelli di previsione della frequenza di patologie muscolo-scheletriche correlate al lavoro degli arti superiori (UL-WMSDs) in popolazioni lavorative esposte a movimenti e sforzi ripetuti degli arti superiori

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## KEY WORDS

Repetitive movements; WMSDs; risk assessment; upper limbs

## SUMMARY

**«The OCRA Method: updating of reference values and prediction models of occurrence of work-related musculo-skeletal diseases of the upper limbs (UL-WMSDs) in working populations exposed to repetitive movements and exertions of the upper limbs».** Background: The paper considers a database of old (already published) and new data concerning 23 groups of workers (Total number of subjects examined=5373) with different levels of exposure to repetitive movements of the upper limbs: for all these groups data were available regarding exposure indexes (OCRA index and Checklist "OCRA" score) and clinically determined UL-WMSD outcomes (PA=Prevalence of workers Affected by one or more UL-WMSDs; PC=Prevalence of single diagnosed Cases of an UL-WMSDs). Objectives: Using these data, the paper aimed at presenting and discussing the results obtained in order to estimate: new critical values of OCRA index for discriminating different exposure levels (green, yellow, red areas); new prediction models of expected PA and PC in exposed populations based on exposure indexes. Methods: New critical values of the OCRA index (and, consequently, of the checklist score) were estimated by an original approach in which data of the effect variable PA in a reference population not exposed to the specific risks were combined with the regression function between OCRA and PA, as resulting from the 23 available groups. Results: The resulting critical values and the consequent classification system of the OCRA index and of the checklist score are synthetically reported in the following table:

Zone	OCRA values	Checklist values	Risk classification
Green	Up to 1.5	Up to A 5	Optimal
Yellow-green	1.6-2.2	5.1-7.5	Acceptable
Yellow	2.3-3.5	7.6-11	Borderline (very light)
Red-low	3.6-4.5	11.1-14	Light
Red-medium	4.6-9.0	14.1-22.5	Medium
Red-high	More than 9.0	More than 22.5	High

*The best simple regression functions between exposure indexes (OCRA; checklist) and health outcome variables (PA; PC) were then sought, in order to obtain prediction models of effects starting from exposure. The following were the main prediction models derived from the available set of data (standard error of b in brackets):*

*– PA (Y) starting from OCRA index values:  $Y=2.39(\pm 0.14)*OCRA$   $R^2=0.92$*

*– PC (Z) starting from OCRA index values:  $Z=6.01(\pm 0.48)*OCRA$   $R^2=0.86$*

*– PA (Y) starting from checklist score values:  $Y=CHECK^{1.004\pm(0.047)}$   $R^2=0.95$*

*– PC (Z) starting from checklist values:  $Z=CHECK^{1.22\pm(0.052)}$   $R^2=0.95$*

*Finally, a multiple regression model was computed for estimating PA (Y) based on OCRA index and gender structure of the group ( $SEXRATIO=n$ . females  $\times 100/n$ . total) with its 5° and 95° percentiles (in brackets); the resulting model was:*

$$Y = 2.02 (1.72-2.32) \times OCRA + 0.075 (0.035-0.115) \times SEXRATIO.$$

*This model showed a very high association between the two independent variables and the effect variable (PA) ( $R^2=0.96$ ). **Discussion:** Discussion of the results obtained considers their intrinsic limits, as they are based on prevalence studies, and also suggests due recommendations and caution in the use of the proposed classification system and prediction models when the OCRA methods are applied for the evaluation of occupational risk associated with repetitive movements of the upper limbs.*