

Development of Ready Reckoner Charts for Easy, Convenient, and Widespread Use of Horrock's Apparatus by Field Level Health Functionaries in India

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Abstract : Aim and Objective of Study : The use of Horrock's Apparatus by health care worker requires onsite mathematical calculations for estimation of 'volume of water' and 'amount of bleaching powder' necessary as per the serial number of first cup showing blue coloration after adding freshly prepared starch-iodide indicator solution. In view of the difficulties of two simultaneous calculations required to be done, the use of Horrock's Apparatus is not routinely done by health care workers because it is impractical and inconvenient. Material and Methods: Arbitrary use of bleaching powder in wells results in hyper-chlorination or hypo-chlorination of well defying the purpose of adequate chlorination or non-usage of well water due to hyper-chlorination. Keeping this in mind two nomograms have been developed, one to assess the volume of well using depth and diameter of well and the other to know the quantity of bleaching powder to be added using the number of the cup of Horrock's apparatus which shows the colour indication. Result & Conclusion: Out of thus developed two self-speaking interlinked easy charts, first chart will facilitate bypassing requirement of formulae ' $V = \frac{\pi r^2 h}{4}$ ' for water volume (ready reckoner table with depth of water shown on 'X' axis and 'diameter of well' on 'Y' axis) and second chart will facilitate bypassing requirement formulae ' $\frac{2ab}{455}$ ' (where 'a' is for 'serial number of cup' and 'b' is for 'water volume', while ready reckoner table showing 'water volume' shown on 'X' axis and 'serial number of cup' on 'Y' axis). The use of these two charts will help health care worker to immediately known, by referring the two charts, about the exact requirement of bleaching powder. Thus, developed ready reckoner charts will be easy and convenient to use for ensuring prevention of water-borne diseases occurring due to hypo-chlorination, especially in rural India and other developing countries.

Keywords : apparatus, bleaching, chlorination, Horrock's, nomogram

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