

Supplementary material

Appendix 1: Radar Plot Geometry

X = meter blood glucose result

Y = Laboratory comparator (eg, YSI) result

Min = minimum value of YSI or other laboratory comparator result

Max = maximum value of YSI or other laboratory comparator result

Mid = (Min + Max) / 2

r = Max – Min = range of laboratory values

$$R = \begin{cases} 100 * \frac{X - Y}{Y}, & Y \geq 100 \text{ mg/dL} \\ X - Y, & Y < 100 \text{ mg/dL} \end{cases}$$

Let $\theta_{max} = 2\pi$

$\theta_{min} = \pi$

$$b_1 = \begin{cases} \frac{\pi}{r} & R < 0 \\ -\frac{\pi}{r} & R \geq 0 \end{cases}$$

$b_0 = \pi - b_1 \text{Min}$

$\theta = \text{mod}(b_0 + b_1 Y, 2\pi)$ (ie, principle value of θ , modulus = 2π).

The polar coordinates of every pair (X, Y) are $(|R|, \theta)$. To translate this so the radar plot can be constructed using software that makes plots in an (x, y) plane, use:

$$x = |R|\cos(\theta) \text{ and } y = |R|\sin(\theta)$$

Note that if $|R| \geq 35$, the radius, $|R|$, is set to 35