where

$B = 1/D_L + P_L/V_A$
M = Ratio of affinity of blood for CO to that for O_2; M = 218
OHb = mL of O_2 per mL blood; OHb = 0.2
$COHb_t$ = mL of CO per mL blood at time
P_{O2} = average partial pressure of oxygen in the lung capillaries; P_{O2} = 100 mm Hg
V_{CO} = rate of endogenous CO production; V_{CO} = 0.007 mL/min
D_L = diffusivity of the lung for CO; D_L = 30 mL/min mm Hg
P_L = barometric pressure minus the vapor pressure of water at body temperature
P_L = 713 mm Hg
Vb = blood volume; Vb = 5,500 mL
P_{CO} = partial pressure of CO in the air inhaled (mm Hg)
V_A = alveolar ventilation rate; V_A = 6,000 mL/min (awake), 4,000 mL (sleeping)
t = exposure duration (min)

Peterson and Stewart (1970) reported that the CFK model well predicted COHb measured in 18 healthy male students, aged between 24 and 42 years, who were exposed to the following combinations of CO concentrations and exposure times: about 50 ppm for 30 min to 24 h, about 100 ppm for 15-480 min, about 200 ppm for 15-120 min, and about 500 ppm for 15-114 min. They used the following integrated form of the CFK equation and parameters:

$$\frac{A * COHb_t - B * V_{CO} - P_{CO}}{A * COHb_0 - B * V_{CO} - P_{CO}} = \exp(-t\,A / B * Vb)$$

where

$A = P_{O2}/M\ OHb$
$B = 1/D_L + P_L/V_A$
M = Ratio of affinity of blood for CO to that for O_2; M = 218
OHb = mL of O_2 per mL blood; OHb = 0.2
$COHb_t$ = mL of CO per mL blood at time
$COHb_0$ = mL of CO per mL blood at beginning of the exposure
P_{O2} = average partial pressure of oxygen in the lung capillaries; P_{O2} = 100 mm Hg
V_{CO} = rate of endogenous CO production; V_{CO} = 0.007 mL/min
D_L = diffusivity of the lung for CO; D_L = 30 mL/min mm Hg
P_L = the vapor pressure of water at body temperature, P_L = 713 mm Hg
Vb = blood volume; Vb = 5,500 mL
P_{CO} = partial pressure of CO in the air inhaled (mm Hg)
V_A = alveolar ventilation rate; V_A = 6,000 mL/min (awake), 4,000 mL (sleeping)
t = exposure duration (min)