Probability to Log Odds:

For categorical

- p = event rate for that level
- odds = p/(1-p)
- odds ratio = $\text{odds}_{\text{level}}/\text{odds}_{\text{reference level}}$
- log odds ratio = ln(odds ratio)

Log odds ratio against reference level = 1.2
Odds ratio against reference level = $e^{1.2} = 3.32$
Probability/event rate in training data = 3.32/(1 + 3.32) = 0.76
"Holding all other variables constant, a person being male changes the odds of the event occurring by a factor of 3.32 over the reference level on average."

$$\hat{y} = \text{“log odds”} = \log(\text{p}/(1-\text{p})) = 1.7 - \boxed{0.54} * age + \boxed{1.2} * male$$

For interval:

- p = change in event rate for one unit increase; this is ***not*** constant
- odds = $\text{odds}_{\text{level}}$ - $\text{odds}_{\text{level +1}}$, this ***is*** constant
- Log odds = ln(odds)

Log odds = -0.54
Odds = $e^{-0.54} = 0.58$
"Holding all other variables constant, for a one unit increase in age, the odds of the event occurring change by a factor of 0.58 on average."