Department of Environmental Quality

Safe Lifting Techniques

Back Injuries

- 80% of Americans will experience back problems
- 50% of American workers claim to have experienced back pain every year

Contributing Factors

- **Age**: back pain usually begins around 30 years old
- **Lack of Exercise**: unused, weak muscles can lead to pain
- **Excess Weight**: excess weight puts strain on the back
- **Diseases**: such as arthritis
- **Improper Lifting Technique**: using the back instead of legs
- **Psychological Conditions**: stress, depression, anxiety
- **Smoking**: decreases blood flow to the spine

NIOSH Lifting Equation

This equation considers six factors and calculates a maximum safe weight to lift based on:

- Frequency (lifts per time-period)
- Asymmetric Factor (twisting while lifting)
- Horizontal Factor (horizontal location of object to body)
- Vertical Factor (vertical location of object relative to floor)
- Coupling Factor (quality of grip)
- Distance Factor (distance the object is moved vertically)

NIOSH Lifting Equation

The maximum weight that any one person should ever lift alone is 51 lbs. This weight assumes you are lifting with two hands under ideal conditions.

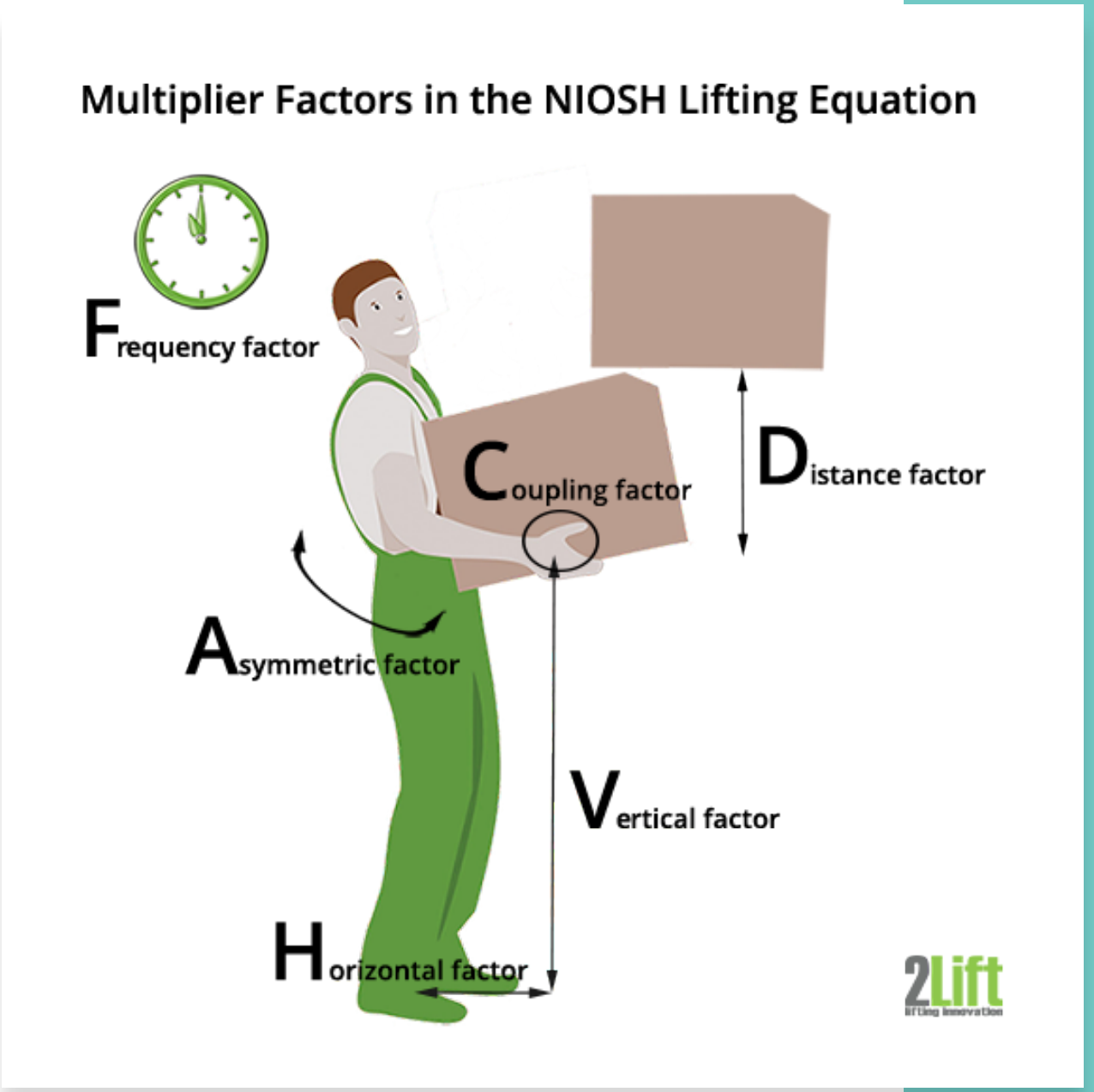
NIOSH starts with a maximum safe weight of 51 lbs. and reduces it based on the previous six factors.

NIOSH Lifting Equation

The maximum weight any worker should ever lift alone is 51 lbs. This weight assumes you are lifting with two hands under ideal conditions.

NIOSH starts with a maximum safe weight of 51 lbs. and reduces it based on the previous six factors.

NIOSH Lifting Equation



NIOSH Lifting Equation

Assumptions & Limitations:

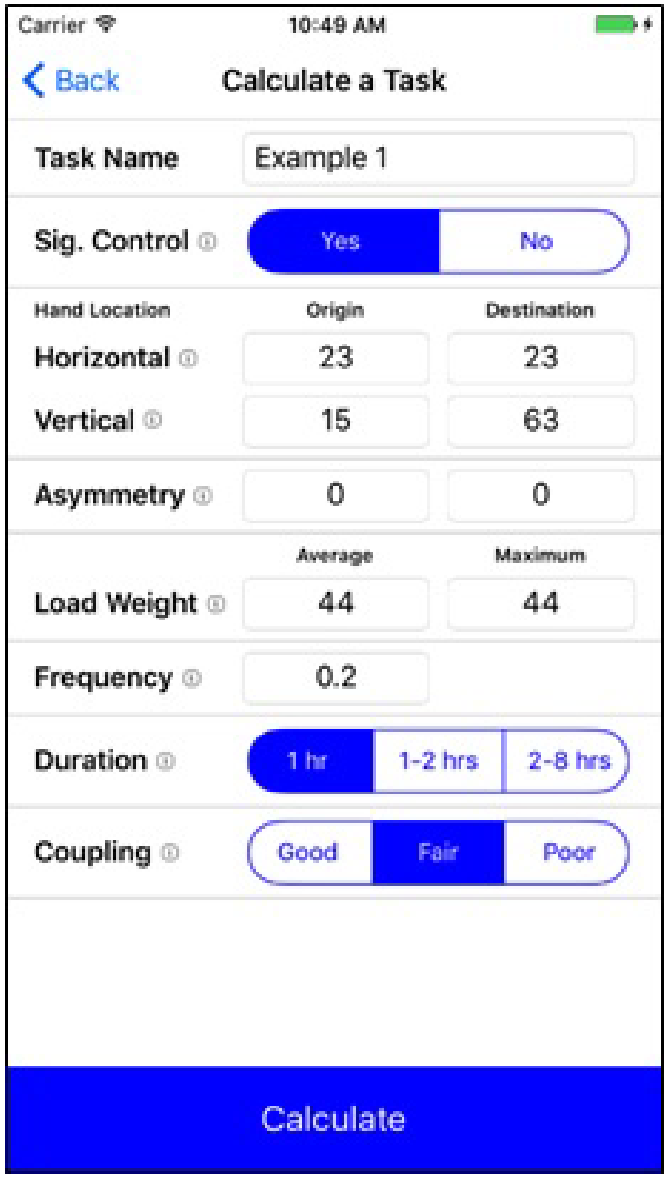
- Temperature range of 66 F to 79 F
- Humidity range of 35% - 65%
- Does not differentiate between sexes

NIOSH Lifting Equation

Summary:

- There is a numerical way to evaluate repetitive lifting tasks
- Repetitive lifting tasks should be evaluated by a safety professional
- The formula is only valid in certain temperature and humidity ranges
- NIOSH says never lift more than 51 lbs. by yourself. Get a helper or use a mechanical device.

There's an app for that!



The name of this free app is "NLE Calc"

NORTH CAROLINA
Department of Environmental Quality

Maximum Weight for 90% to Lift Once per Shift

Sex	Floor level to knuckle height	Knuckle height to shoulder height	Shoulder height to overhead
Male	24 lb.	22 lb.	20 lb.
Female	18 lb.	14 lb.	12 lb.

Ciriello et al., 1993

Maximum Weight for 90% of Workers to Safely Lift Once per 8 Hours

Sex	Floor level to knuckle height	Knuckle height to shoulder height	Shoulder height to overhead
Male	24 lb.	22 lb.	20 lb.
Female	18 lb.	14 lb.	12 lb.

Ciriello et al., 1993