



Weekly fitness program for children and young adults with type 1 diabetes - EUT

1. EXPLANATION OF THE ACTIVITY

Regular physical activity is essential to help keep blood glucose levels under control. It is most effective when it includes a combination of both **aerobic exercise** (e.g. jogging, swimming, cycling ...) and **resistance training**, as well as reducing the amount of time spent being inactive.

There are established international pediatric exercise guidelines for the pediatric population and a comprehensive pediatric-specific review of exercise in both T1D and Type 2 Diabetes by Pivovarov et al. provides current perspectives and a decision tree-based approach for blood glucose management in children with T1D .

If you are treated with T1D, staying active can help lower your chances of developing other complications. These can include high blood pressure, heart disease, nerve damage, and vision loss.

Regular exercise may also help improve your overall quality of life.

Strenuous activity can cause blood sugar to drop. This can lead to low blood sugar, which is called **hypoglycemia**. Intense bouts of exercise can also cause blood sugar to rise. If it rises above normal levels, it's known as **hyperglycemia**.

Take a moment to learn how you can exercise with type 1 diabetes while keeping blood sugar in a safe range.

Aerobic exercise involves repeated and continuous movement of large muscle groups . Activities such as walking, cycling, jogging, and swimming rely primarily on aerobic energy-producing systems (day 3 and 4 of the fitness program).

Resistance (strength) training includes exercises with free weights, weight machines, body weight, or elastic resistance bands (day 1 and 2).

Flexibility exercises improve range of motion around joints . Balance activities like tai chi and yoga combine flexibility, balance, and resistance activities (day 6).



Mixed activities, such as interval training or team/individual field sports, are associated with better glucose stability than those that are predominantly aerobic , although variable results have been reported for intermittent, high-intensity exercise (day 5).

In our seven day fitness program for T1D young people we have combined all the types of activities described above to take benefit from their impact on different body systems.

In type 1 diabetes, aerobic training increases cardio respiratory fitness, decreases insulin resistance, and improves lipid levels and endothelial function.

The effect of resistance exercise on glycemic control in type 1 diabetes is unclear. However, resistance exercise can assist in minimizing risk of exercise-induced hypoglycemia in type 1 diabetes.

Stretching increases range of motion around joints and flexibility but does not affect glycemic control.

Additional carbohydrate intake and/or insulin reductions are typically required to maintain glycemic balance during and after physical activity.

Frequent blood glucose checks are required to implement carbohydrate intake and insulin dose adjustment strategies.

Insulin users can exercise using either basal-bolus injection regimens or insulin pumps, but there are advantages and disadvantages to both insulin delivery methods.

Continuous glucose monitoring during physical activity can be used to detect hypoglycemia when used as an adjunct rather than in place of capillary glucose tests.

The target range for blood glucose prior to exercise should ideally be between 90 and 250 mg/dL (5.0 and 13.9 mmol/L).

Carbohydrate intake required will vary with insulin regimens, timing of exercise, type of activity, and more, but it will also depend on starting blood glucose levels.

Very intense exercise such as sprinting, brief but intense aerobic exercise , and heavy power lifting may promote hyperglycemia, especially if starting blood glucose levels are elevated.

Similarly, combining resistance training (done first) with aerobic training (second) optimizes glucose stability in type 1 diabetes.

Individuals with type 1 diabetes should test for blood ketones if they have unexplained hyperglycemia (250 mg/dL).

Exercise should be postponed or suspended if blood ketone levels are elevated (1.5 mmol/L), as blood glucose levels and ketones may rise further with even mild activity.



Regular stretching and appropriate progression of activities should be done to manage joint changes and diabetes-related orthopedic limitations.

Exercise management for young people with T1D is complex and one approach does not fit all.

Many factors influence an individual's glycemic response to exercise including the type, intensity and duration of the activity, the amount of insulin on board and the person's stress/anxiety levels.

To further complicate management, even when all these factors are kept constant, an individual's response to exercise may or may not be predictable on repeated exercise occasions.

Diabetes should not prevent individuals from achieving their exercise goals whether these are occasional fun activities or at a more high-performance level. Indeed, many individuals with T1D have gone on to accomplish extraordinary sporting achievements.

PHYSICAL ACTIVITY PROGRAM

Based on the selected literature, a possible exercise program for people with T1D has been developed.

The project takes place 3 to 6 times/ week, preferably in the morning.

The total time of the program is 12 weeks, and can be carried out by both individuals who have or not have access in sport centres.

The program is designed to fit the possibilities of different target groups about the need of equipments.

The exercise routine should be supervised by professionals.

DAY 1 - HIIT (HIGH INTENSITY INTERVAL TRAINING)

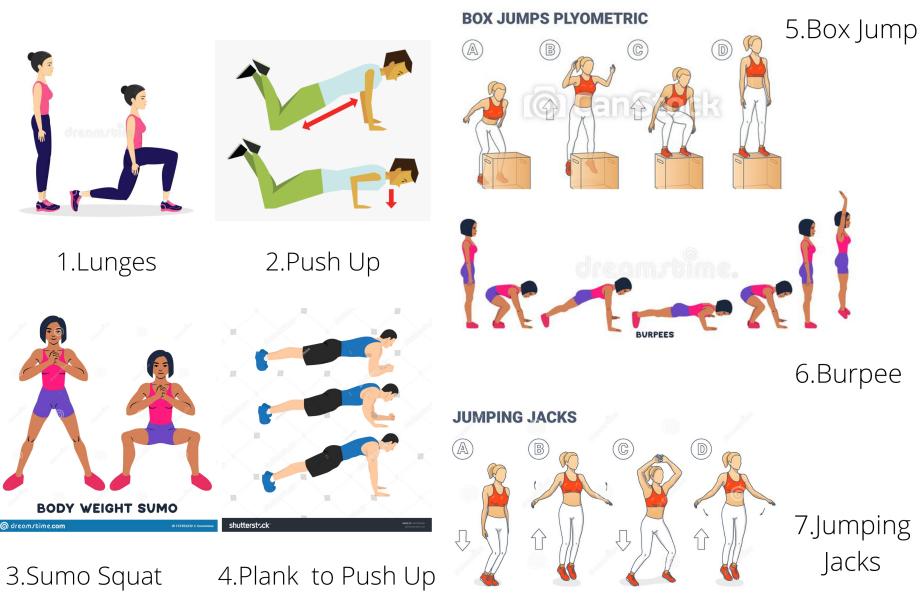
WARM UP: 10-15 MINUTES
9 EXERCISES
30-45 SECOND WARM UP PER EXERCISE

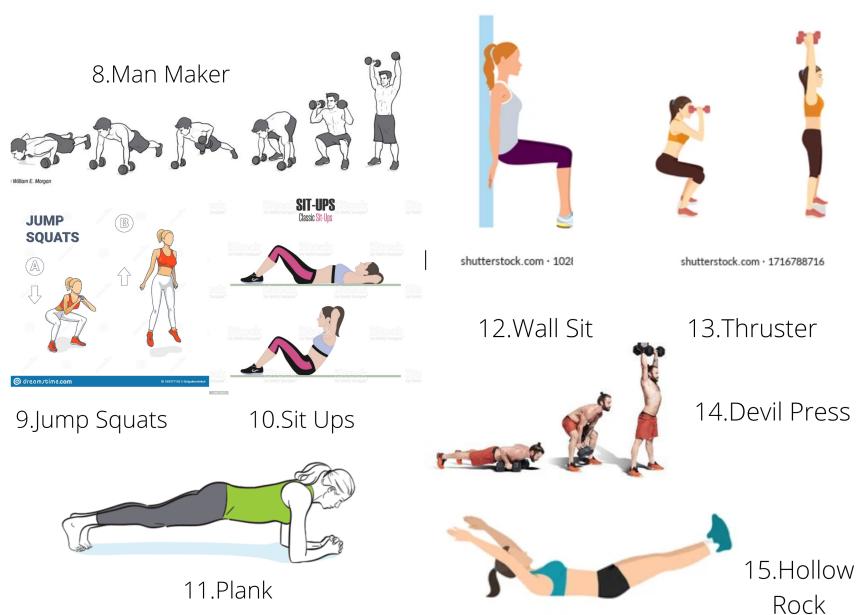


Top10
Home Remedies

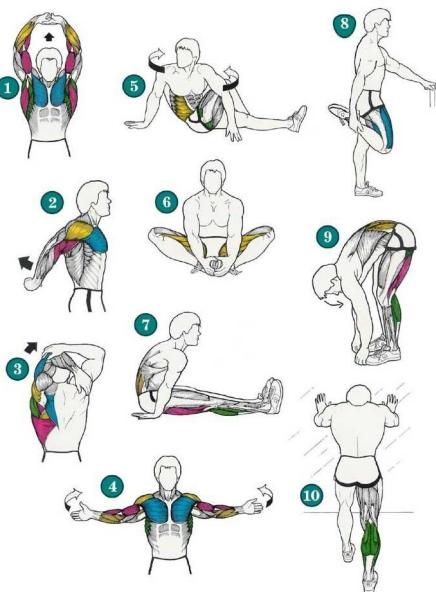
HIIT 15 MINUTES/15 EXERCISES
40 SECOND WORK/ 20 SECONDS BREAK
PUT THE HIIT MUSIC TIMER 40/20 FOR AN EASY ORIENTATION
DO AS MANY REPS AS POSSIBLE FOR EACH EXERCISE

***FOR THE RIGHT TECHNIQUE OF EVERY EXERCISE PLEASE CONSULT YOUR PERSONAL TRAINER OR ASK FOR PROFESSIONAL ADVICE.**



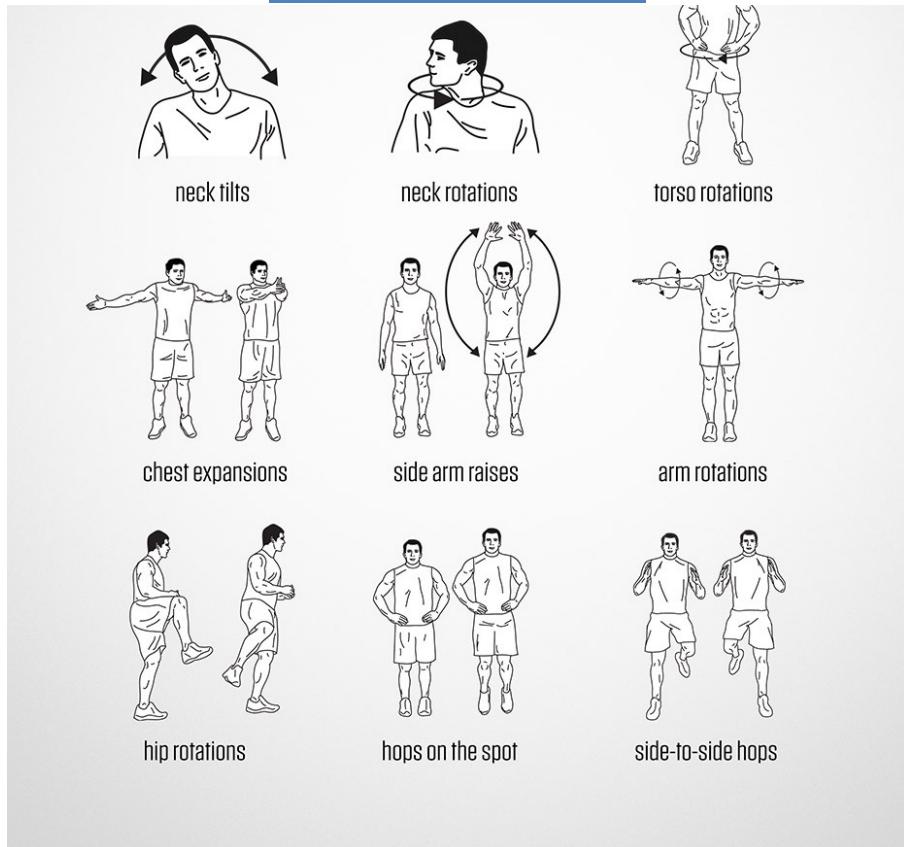


STATIC STRETCHING: 10 MINUTES
15 SECONDS HOLD ON



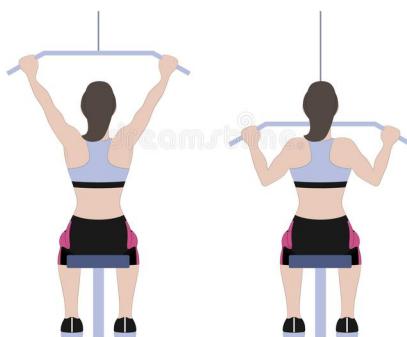
**DAY 2 – RESISTANCE TRAINING**

WARM UP: 10-15 MINUTES
10 REPETITIONS PER SIDE



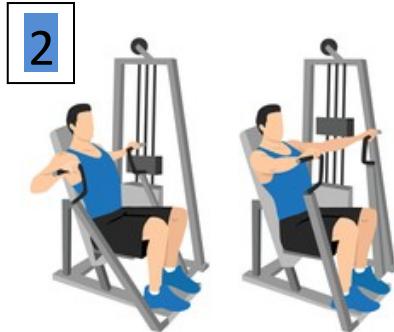
FULL BODY WORKOUT
8 EXERCISES
30-45 SECONDS REST BETWEEN SETS
45-90 SECONDS REST BETWEEN EXERCISES

1

GYM WORKOUT**WIDE-GRIp LAT PULL-DOWN**



LATERAL PULL-DOWN
3 SETS WITH 10 REPS
50-60 % OF 1RM (ONE MAXIMAL REPETITION)



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CHEST SEATED MACHINE PRESS
4 SETS WITH 8 REPS
50-60% OF 1 RM

3 **GYM WORKOUT**
Leg Press

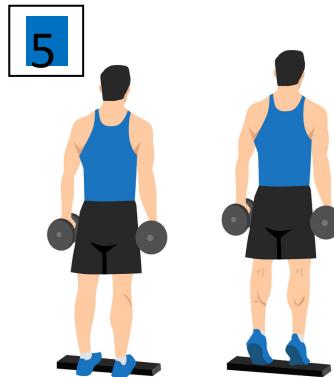


LEG PRESS
3 SETS WITH 12 REPS
60% OF 1 RM

4



SHOULDER PRESS
3 SETS WITH 8 REPS
50% OF 1 RM



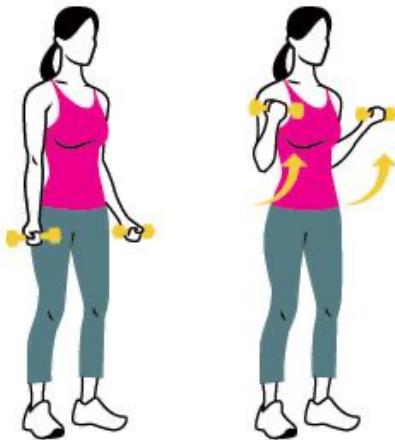
DUMBBELL CALF RAISES
4 SETS WITH 15 REPS
60-70% OF 1 RM



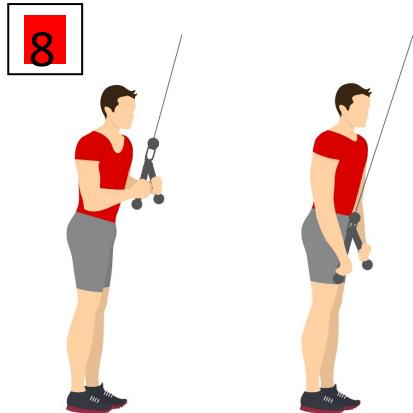


BENCH PRESS
3 SETS WITH 8 REPS
50-60% OF 1 RM

7

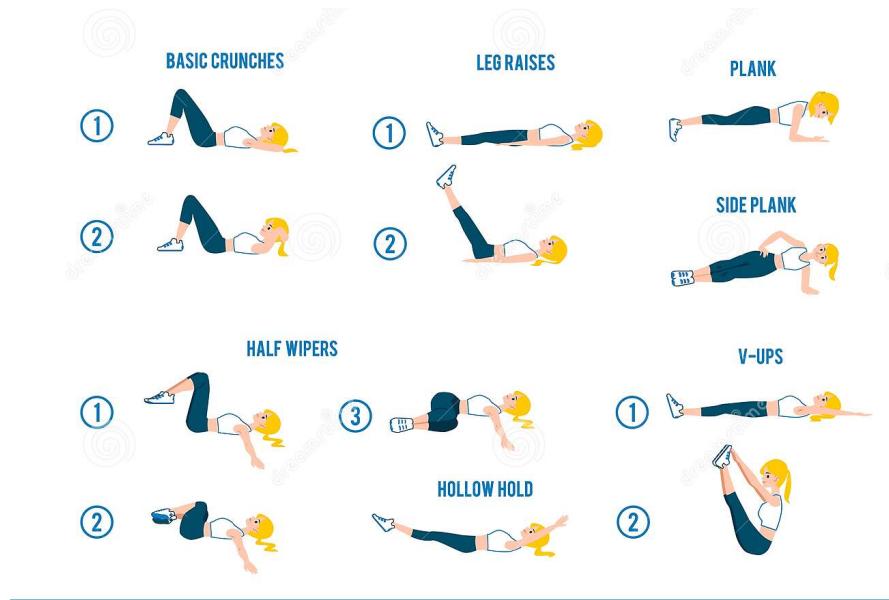


DUMBBELL BICEPS CURL
3 SETS WITH 8 REPS/SIDE
60% OF 1RM



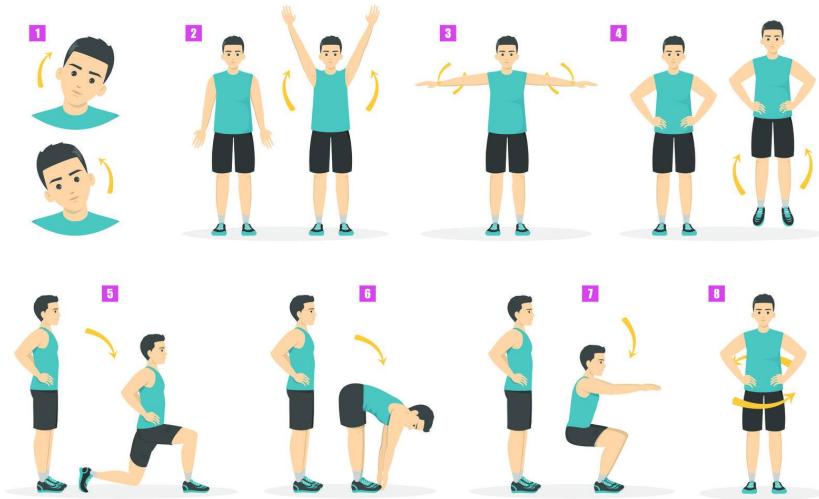
TRICEPS PULL DOWN
3 SETS WITH 8 REPS
60% OF 1RM

ABS WORKOUT 15 MINUTE
3 ROUNDS / EACH EXERCISE
10 REPS
30 SECONDS BREAK BETWEEN SETS AND EXERCISES



DAY 3 – CARDIO

WARM UP: 10-15 MINUTES
8 EXERCISES
30-45 SECONDS WARM UP PER EXERCISE



CARDIO
5 EXERCISES
90 SECONDS REST BETWEEN SETS
120 SECONDS REST BETWEEN EXERCISES



***SECOND ROUND STARTS WHEN YOU FINISH THE FIRST ROUND WITH THE 5 EXERCISES**

1



STATIONARY BIKE
2.5 KM FIRST ROUND AND 2 KM SECOND ONE

2



JUMP ROPE
300 JUMPS FIRST ROUND
200 JUMPS SECOND ONE



ELLIPTICAL ORBIT MACHINE
500 METERS FIRST ROUND/ 400 METERS SECOND ONE



TREADMILL RUN
1.2 KM FIRST ROUND/ 1 KM SECOND ONE



5



STAIR CLIMBER MACHINE
25 CALORIES FIRST ROUND
20 CALORIES SECOND ONE

LOWER BODY STATIC STRETCH: 10 MINUTES
15 SECONDS HOLD ON FOR EACH PART



Shoulder Stretch



Toe Touch



Samson Stretch



Butterfly Stretch



Quadriceps Stretch



Cobra Stretch



Knee to Chest



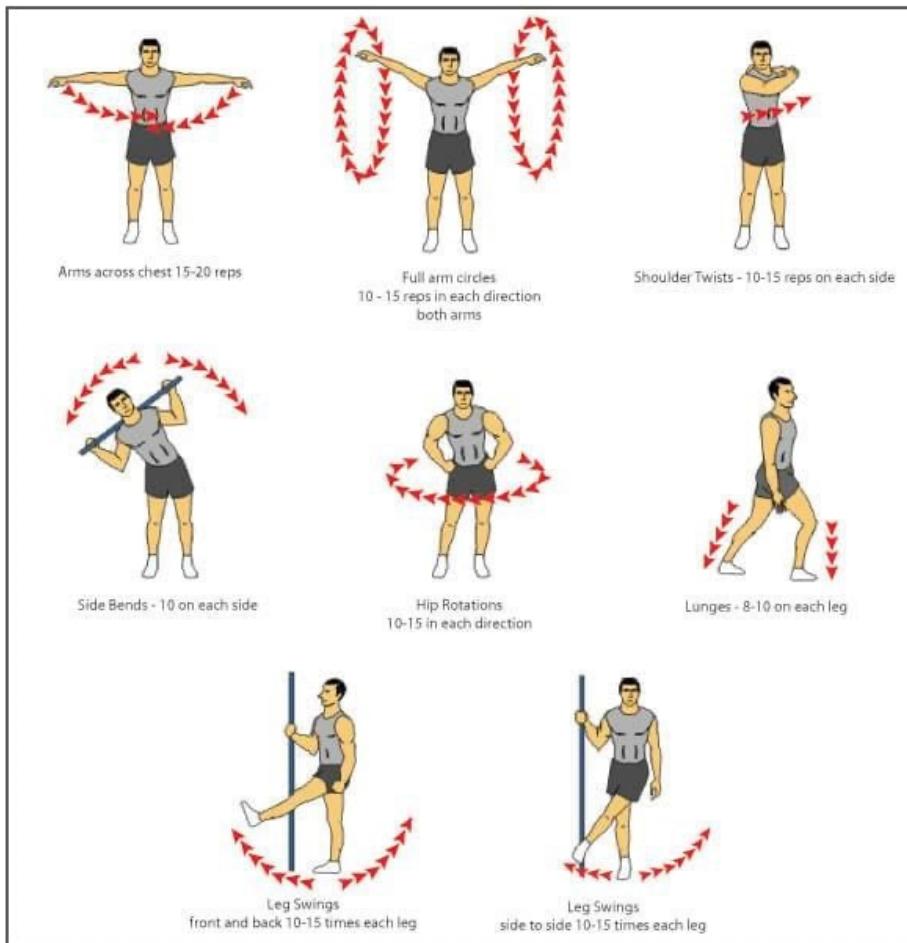
Cat Stretch/Cow Stretch



Side Bend



Calf Stretch

**DAY 4 - DAY OFF : A WALK TO RELAX AND REGENERATE****DAY 5: SPORTS****WARM UP: 10-15 MINUTES**



SPORTS
EACH WEEK CHOOSE A SPORT TO PLAY
NO MATTER IF YOU PLAY IN A TEAM OR YOU DO SOME DRILLS OF THAT
SPORT BY YOURSELF
30-45 MINUTES OF SPORT ACTIVITY/WEEK

***IMPORTANT IS THE FACT THAT THE INTENSITY MUST BE LOW TO**
Moderate AND EVERY TEAM MEMBER MUST KNOW YOUR HEALTH
CONDITION
TAKE WITH YOU SOME CANDIES AND A FIRST AID KIT FOR ANY
INCONVENIENCE



FOOTBALL

BASKETBALL

**VOLLEYBALL**

FULL BODY STRETCHING: 10 MINUTES
15 SECONDS HOLD ON FOR EACH PART WITH THE HELP OF A FRIEND



**DAY 6: FLEXIBILITY**

WARM UP: 10-15 MINUTES
THIS TIME WARM UP YOURSELF BY DANCING THE SONGS YOU LIKE THE MOST



YOGA FLEXIBILITY
30-45 SECONDS FOR EACH POSITION

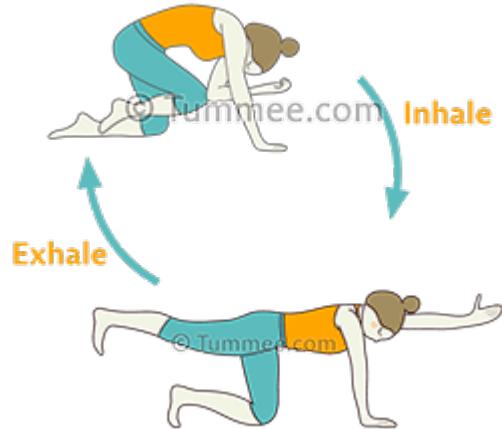


ABDOMINAL STRETCH



BACK RELEASE

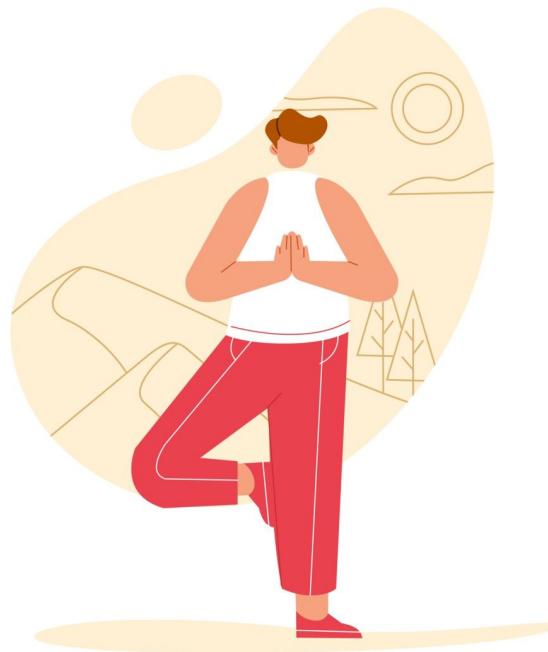
YOGA POSE



CORRECT BREATHING PROCESS



ADVANCED YOGA POSE



BALANCE



BRIDGE

INHALE-EXHALEDAY 7: REST DAY

ONE DAY PER WEEK MUST BE TOTALLY OFF SO YOUR CELLS ARE
REGENERATED

***IT IS NOT SAID THAT DAY 1 IS MONDAY AND DAY 7 IS SUNDAY. YOU CAN MIX
THE DAYS ACCORDING TO YOUR PLANS.**

***TRAIN FOR A MINIMUM OF 3 DAYS PER WEEK TO A MAXIMUM OF 6 DAYS PER
WEEK, FOR 60 MINUTES UNDER THE SUPERVISION OF A FITNESS TRAINER.**

***BY CREATING YOUR TRAINING ROUTINE YOU WILL BE ABLE TO
UNDERSTAND BETTER YOUR BODY REACTIONS.**