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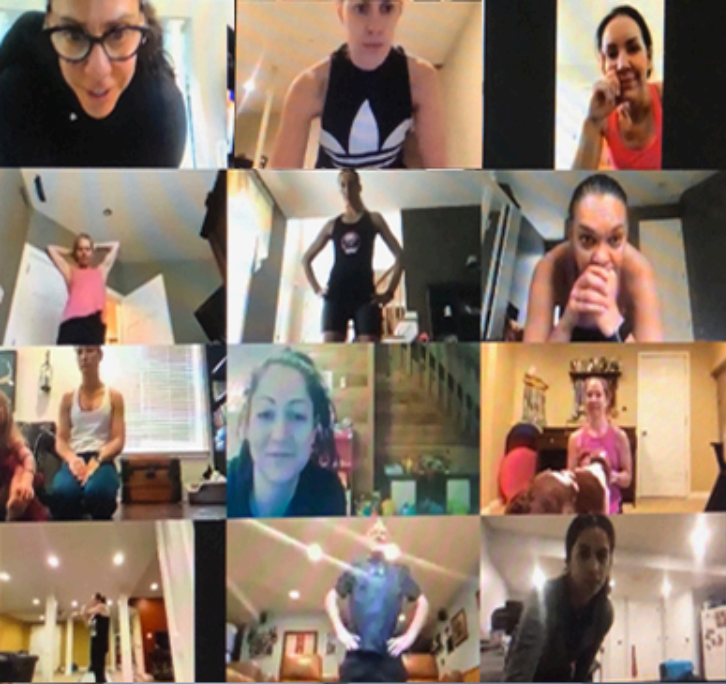
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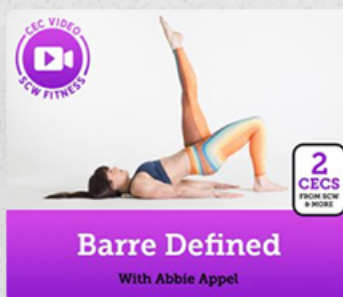
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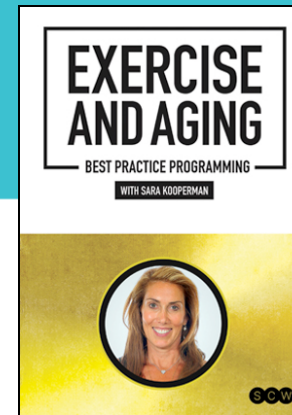
Strength Training for Longevity & Vitality

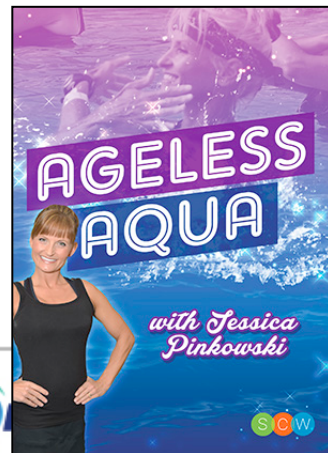
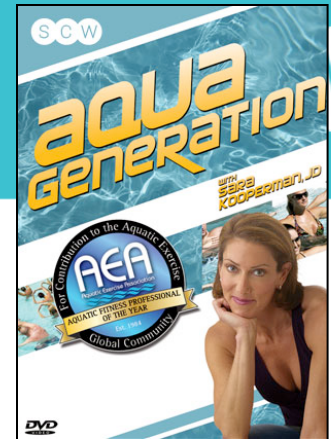
With Sara Kooperman

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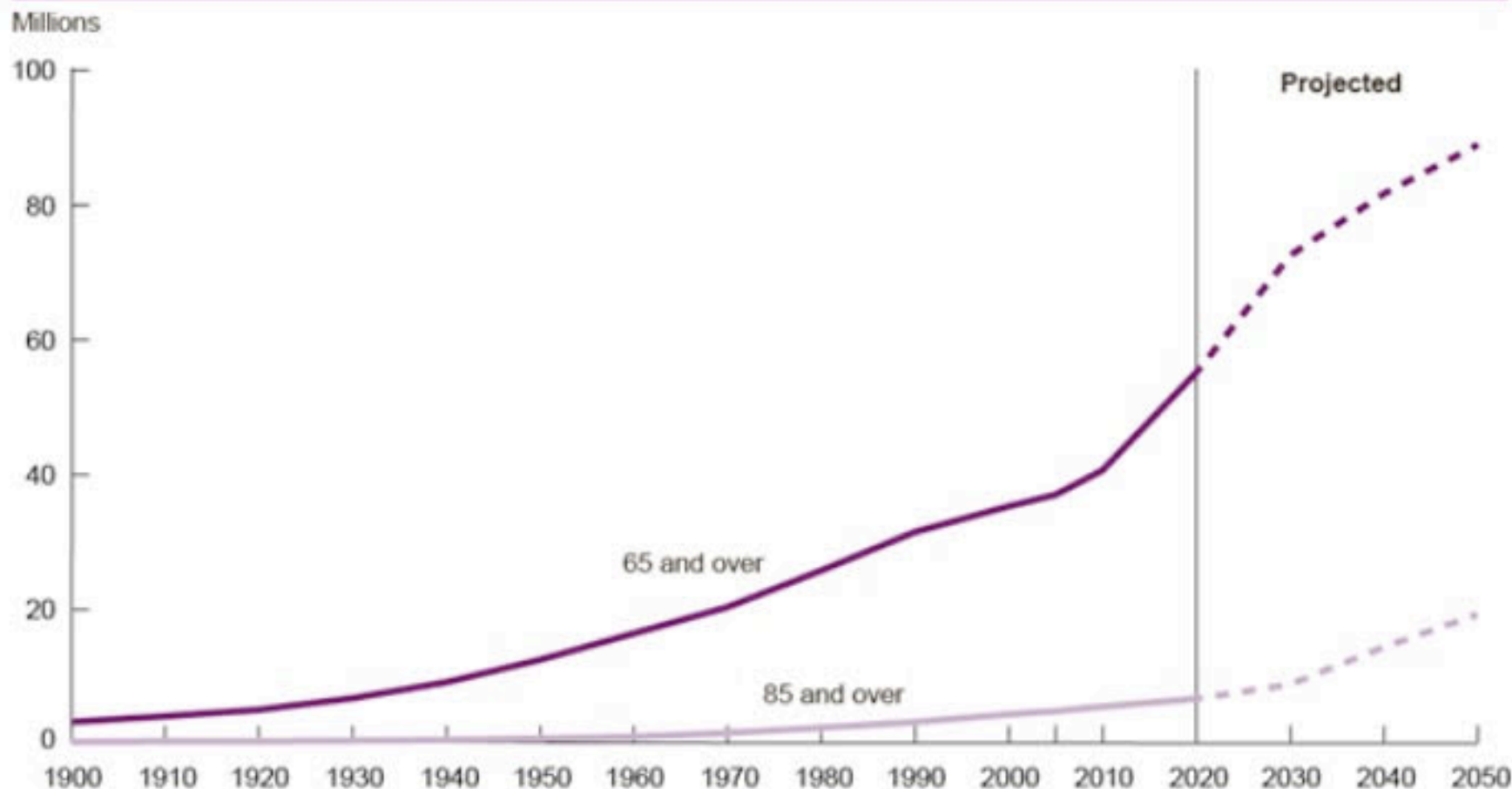


Aging Population Growth



- The number of persons 60 year old will increase 5 times in the next decade
- 1930 – 5.4% of population over 60 (7 million)
- 2015 – 33% were already over 50
- 2030 – 20% will be over 65 (UN Population Division)
- Median age has raised
 - 35.3 in 2000 to 37.2 in 2010, **NOW – 47.5**
 - 7 states have median age of 40 or older
 - Maine (42.7), Vermont (41.5), West Virginia (41.3), New Hampshire (41.1), Florida (40.7), Pennsylvania (40.1) and Connecticut (40.0)

Population age 65 and over and age 85 and over, selected years 1900–2010 and projected 2020–2050

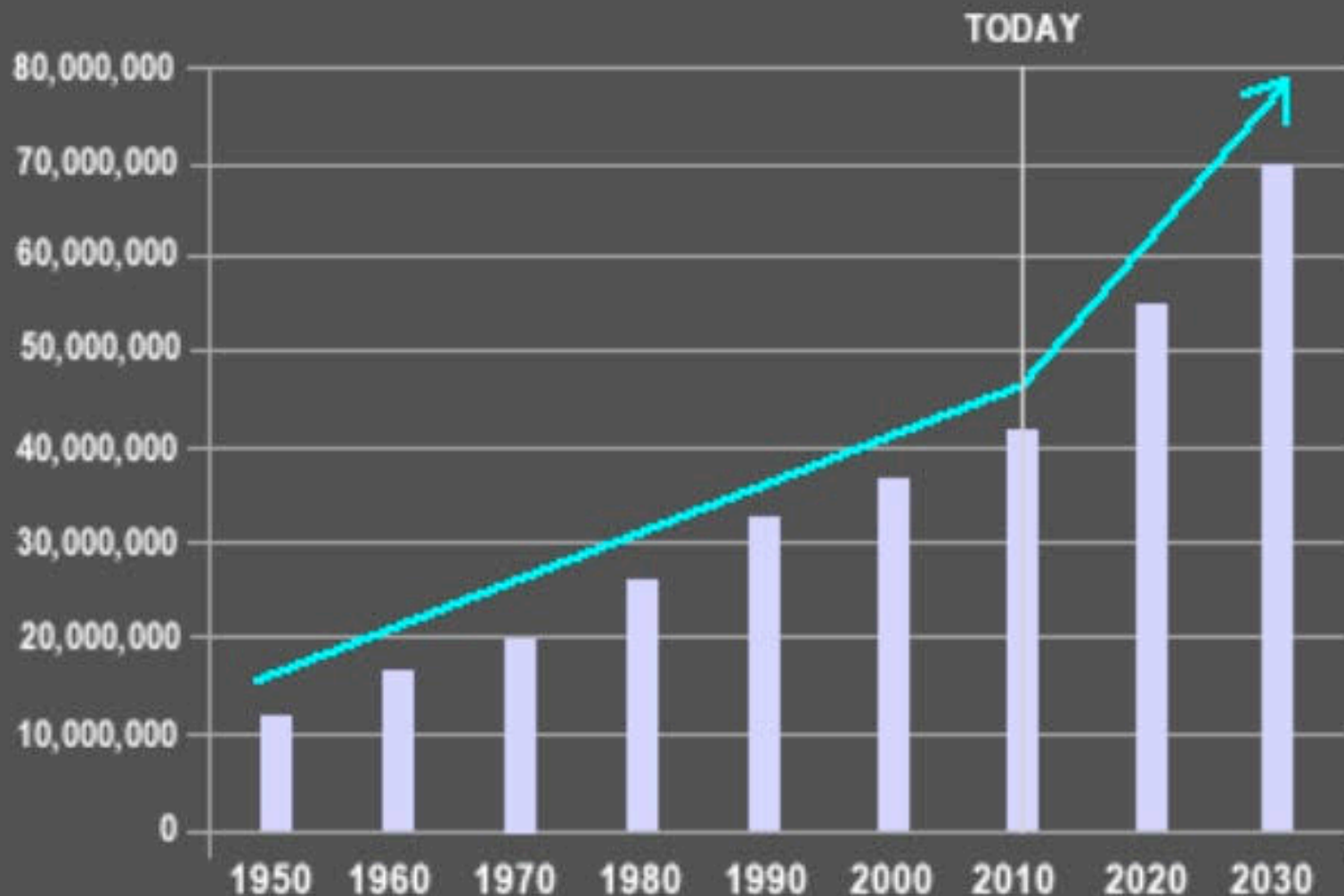


NOTE: These projections are based on Census 2000 and are not consistent with the 2010 Census results. Projections based on the 2010 Census will be released in late 2012.

Reference population: These data refer to the resident population.

SOURCE: U.S. Census Bureau, 1900 to 1940, 1970, and 1980, U.S. Census Bureau, 1983, Table 42; 1950, U.S. Census Bureau, 1953, Table 38; 1960, U.S. Census Bureau, 1964, Table 155; 1990, U.S. Census Bureau, 1991, 1990 Summary Table File; 2000, U.S. Census Bureau, 2001, *Census 2000 Summary File 1*; U.S. Census Bureau, Table 1: Intercensal Estimates of the Resident Population by Sex and Age for the U.S.: April 1, 2000 to July 1, 2010 (US-EST00INT-01); U.S. Census Bureau, 2011, *2010 Census Summary File 1*; U.S. Census Bureau, Table 2: Projections of the population by selected age groups and sex for the United States: 2010–2050 (NP2008-12).

Projected Acceleration of Population Aging



U.S. POPULATION OF THOSE 65 AND OLDER Source: U.S. Bureau of the Census

Prepare for this increase in older adults

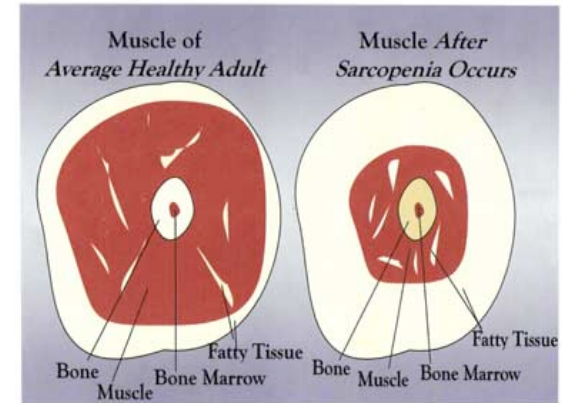
Prepare for the decrease in health care



Sarcopenia



- Sarcopenia = Poverty of the Flesh
- Loss of :
 - Muscle mass
 - Strength
 - Power
 - Function
- 5-13% of all persons aged 60-70 years
- 11-50% of persons in their 80s
- Adults between the ages of 50-80 years old can lose up to eight times more muscle mass than is lost in the previous 30 years



Sarcopenia: Age related loss of Muscle



Age 25

Age 65

Causes of Sarcopenia



- 1. Reduction in Muscle Activation
 - Inactivity, Loss of motor neurons
 - Decreased insulin (growth/protein) factors
- 2. Oxidative damage by reactive oxygen species
 - ROS – overproduction attacks cells
- 3. Nutritional Factors
 - 25% decrease in food intake, less protein
 - Low vitamin D absorption (muscular and neuron function)



Combat Sarcopenia



- Activity!
- Type II Fast Twitch glycolic muscle fibers affected the most
 - perform fast twitch activating movements
- A diet rich in antioxidants – fruits & veggies
- Increase healthy protein intake



6 Winning strategies to preserve long term muscle health



Vitamin D



Plenty of antioxidants



ω 3 fatty acids



Adequate protein intake



Folic acid and B12



Resistance training

- Everything in Moderation including moderation
- Physical Activity Guidelines for Americans
 - At least 150 minutes of moderate-intensity aerobics exercise per week (2.5 hr/week 5 30 min. walks), OR
 - 75 minutes a week of vigorous-intensity aerobic physical activity, OR
 - Combination of both



General Recommendations



- Muscle-strengthening Activity
- Moderate or “high” intensity
- All major muscle groups
- 2 or more days a week
- Combination of cardio
& strength



Hunter & colleagues 2013 Research

- 72 women (ages 60-72), no metabolic disorders, non-smokers, sedentary (exercising less than 1 time per week)
- 16 weeks
- Analyze : Cardio to Strength
- 1-1, 2-2, 3-3 (aerobic to weights)
- Strength Training
 - 2 sets 10 reps
 - 1.5-2 min rest in-between
 - Start 60% capacity increasing to 80% 1-RM



Conclusion to Hunter Study



- AEROBIC CAPACITY
 - All groups significantly increased their aerobic capacity
 - No statistical difference between 1-1, 2-2 and 3-3
- BODY COMPOSITION
 - All groups lost (approx. 3 lbs), reduced body fat (.5-2%), gained muscle (.4-.7kg)
 - No statistical difference between 1-1, 2-2 and 3-3



More is NOT better!



- MUSCULAR STRENGTH
 - Total Daily Energy Expenditure (TEE),
 - Non-Exercise Activity Thermogenesis (NEAT) &
 - Activity-Related Energy Expenditure (AEE)
 - **2-2 improved significantly in all the above!**
 - 1-1 & 3-3 did not and 3-3 even reduced NEAT
- FEELINGS OF FATIGUE/DEPRESSION
 - No significant difference
 - 3-3 Complained that the 6-day week was excessive, suggesting failed long-term adherence to this protocol

Osteoarthritis



- The most common form of arthritis
- Degenerative joint disease characterized by the breakdown of cartilage and its underlying bones
- Leads to joint pain and stiffness
- Before 45 – more men
- After 45 - more women
- 34% (12.4 million) individuals 65+
- Greatest cause – being overweight (25%)



Top 11 Exercises for Older Adults



- Squats to a Chair
- Bicep/Tricep
- Wall Push-Ups
- Side-Leg Lifts
- Opposite Arm & Leg Balance
- Dead Bugs
- Bridges
- Toe & Heel Lifts
- Wall Angels
- Finger walks Up a wall
- Fingers/Hands



Strength Training Helps



- Arthritis
 - Reduces pain and stiffness, increases strength and flexibility.
- Diabetes
 - Improves glycemic control
- Osteoporosis
 - Builds bone density & reduces risk of falls
- Heart Disease
 - Reduces cardiovascular risk by improving lipid profile
- Back Pain
 - Strengthens back and ab muscles to reduce stress on the spine
- Obesity
 - Increases metabolism, burns more calories
 - Helps with long-term weight control



- Free Downloadable book for clients:
 - Strength Training for Older Adults : Growing Stronger

http://www.cdc.gov/physicalactivity/downloads/growing_stronger.pdf - Tufts 2002



Resistance-Training Considerations



- FREQUENCY
- DURATION
- EXERCISE SELECTION
- SETS
- INTENSITY
- REPETITIONS
- PROGRESSION



ACSM Guide for Senior Exercise



- Frequency 2-4 times per week of strength training (48 hrs between training sessions)
- Avoid lengthy training sessions – risk of extreme fatigue (20-40 min . 30 min average)
- Multi-joint exercises recommended (bench press, leg press – not bicep curls alone)
- Recommend machines vs free weights because of skill levels (can progress)
 - Skill issues and safety factors



6 Areas to Focus on



- Back – lattissimus dorsi, erector muscles
- Chest - pectoral
- Shoulders – deltoid, rotator cuff, scapular stabilizers & trapezius
- Arms – biceps, triceps & forearms
- Abdomen – rectus abdominus, oblique, intercostals
- Legs – hip (gluteal) thigh (quads) hamstring

- 1-2 exercises per muscle group is adequate
- Multi-joint exercises employ more than 1 muscle
- Perform multi-joint exercises before uni-joint exercises
- Larger muscle groups worked before smaller
- Perform 1-3 sets (2 recommended to avoid excess fatigue + 2-3 min rest between



Intensity



- Amount of weight
- No more than 80% up to 85% - no max testing
- 65-75% Training adequate in older adults
- As intensity increases, repetitions decline
 - 60% capacity = 16-20 Repetitions
 - 65% = 14-15 reps
 - 70% = 12-13 reps
 - 75% = 10-11 reps
 - 80% = 8-9 reps
 - 85% = 6-7 reps



<https://www.acsm.org/docs/current-comments/resistancetrainingandtheoa.pdf>

Tubing Exercises



- Multi-Joint
- Low risk of over-doing
- Creativity
- Risk of improper form
- Portability
- Total Body
- Affordable
- Convenient



RESISTANCE TUBING EXERCISES

Back / Legs / Biceps / Chest and Triceps

Torso Stabilization

Torso stabilization is the process of tightening the "core" muscles around your spine in order to stabilize your body. This is done by pulling the spine into a neutral position, which is the position of the spine when it is standing upright.

It is important to keep the spine in a neutral position at all times, even when performing exercises. This is because the spine is the foundation of the body, and if it is not in a neutral position, the rest of the body will be affected.



Bent Over Row



1. Stand on tubing, feet shoulder-width apart. Grasp left handle in right hand, and right handle in left, so tubing is crossed and bent. Bend knees.
2. Bending knees, bend forward at hips until shins are vertical.
3. Pulling arms straight back, pull arms back until they are straight.
4. Pause, then slowly return to start.

Seated Row



1. Sit on floor and wrap tubing around feet with both sides equal length. Stabilize torso.
2. Holding one handle in each hand by knees, straighten knees as tubing is bent.
3. Pulling arms straight back, pull arms back until they are straight.
4. Pause, then slowly return to start.

Squat



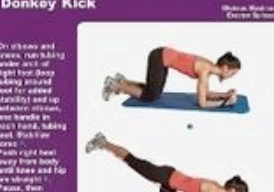
1. Stand in middle of tubing with feet at shoulder-width. Bend knees slightly. Stabilize torso.
2. Holding one handle in each hand by knees, straighten knees as tubing is bent.
3. Pulling arms straight back, pull arms back until they are straight.
4. Pause, then slowly return to start.

Squat and Side Leg Lift



1. Stand on tubing, feet at shoulder-width, grasping a handle in each hand. Stabilize torso.
2. With handles at shoulder level, lower legs into a squat, lifting feet.
3. Keeping legs from rising, lift right leg up and hold it straight out to the side. Pause, then slowly return to start.
4. Repeat on other side.

Donkey Kick



1. On elbows and knees, hold tubing under arch of right foot. Bend knees slightly and lift right leg up and hold it straight out to the side. Pause, then slowly return to start.
2. Push right heel away from body until knee and hip are straight.
3. Pause, then slowly return to start.

Bridge



1. Lie on back, knees bent with feet flat on floor and tubing around ankles. Grasp one handle in each hand and hold it straight out to the side. Stabilize torso.
2. Pushing hips up, lift hips until they are straight.
3. Pause, then slowly return to start.

Arm Curl



1. In a staggered stance, place right foot in hallway along tubing. Bend knees slightly and lift right leg up and hold it straight out to the side. Stabilize torso.
2. Pushing right heel away from body until knee and hip are straight.
3. Pause, then slowly return to start.

Arm Shoulder Combo



1. Stand with feet staggered, shoulder-width apart. Place right foot in hallway along tubing, and grasp handle with right hand, so tubing is bent. Bend knees.
2. Pushing right heel away from body until knee and hip are straight.
3. Pause, then slowly return to start.

Overhead Tricep Extension



1. In a staggered stance, place right foot in hallway along tubing. Bend knees slightly and lift right leg up and hold it straight out to the side. Stabilize torso.
2. Pushing right heel away from body until knee and hip are straight.
3. Pause, then slowly return to start.

Tricep Kickback



1. In a staggered stance, place right foot in hallway along tubing. Bend knees slightly and lift right leg up and hold it straight out to the side. Stabilize torso.
2. Pushing right heel away from body until knee and hip are straight.
3. Pause, then slowly return to start.

Push Up



1. In a staggered stance, place right foot in hallway along tubing. Bend knees slightly and lift right leg up and hold it straight out to the side. Stabilize torso.
2. Pushing right heel away from body until knee and hip are straight.
3. Pause, then slowly return to start.

Across the Chest Pull



1. In a staggered stance, place right foot in hallway along tubing. Bend knees slightly and lift right leg up and hold it straight out to the side. Stabilize torso.
2. Pushing right heel away from body until knee and hip are straight.
3. Pause, then slowly return to start.

RESISTANCE TUBING EXERCISES

Shoulders / Rotator Cuff and Core

Torso Stabilization

Torso stabilization is the process of tightening the "core" muscles around your spine in order to stabilize your body. This is done by pulling the spine into a neutral position, which is the position of the spine when it is standing upright.

It is important to keep the spine in a neutral position at all times, even when performing exercises. This is because the spine is the foundation of the body, and if it is not in a neutral position, the rest of the body will be affected.



Standing Side Raise



1. Stand on tubing, feet shoulder-width apart. Grasp left handle in right hand, and right handle in left, so tubing is crossed. Stabilize torso.
2. Bending knees slightly, hold handles in front of hips, arms facing forward, holding feet.
3. With arms stiff and slight bend in elbows, use shoulders to raise arms forward.
4. Pause, then slowly return to start.

Standing Front Raise



1. Stand on tubing, feet shoulder-width apart. Grasp left handle in right hand, and right handle in left, so tubing is crossed. Stabilize torso.
2. Bending knees slightly, hold handles in front of hips, arms facing forward, holding feet.
3. With arms stiff and slight bend in elbows, use shoulders to raise arms forward.
4. Pause, then slowly return to start.

Front and Side Raise with Split Squat



1. With a handle in each hand, run tubing under right foot.
2. Step forward with left leg, bending front knee, lower legs forward floor.
3. Slowly raise arms straight in front, keeping elbows stiff and slightly bent.
4. Raise arms to sides until horizontal. Pause, then slowly return to start.

Bent to Overhead Press



1. Stand on tubing, feet shoulder-width apart. Grasp left handle in right hand, and right handle in left, so tubing is crossed. Stabilize torso.
2. Bending knees slightly, hold handles in front of hips, arms facing forward, holding feet.
3. With arms stiff and slight bend in elbows, use shoulders to raise arms forward.
4. Pause, then slowly return to start.

Olympic Snatch



1. Grasp a handle in each hand, stand on tubing with feet slightly wider than shoulder-width. Stabilize torso.
2. Squat down, keeping back slightly arched and knees behind feet.
3. Pushing right heel away from body until knee and hip are straight.
4. Pause, then slowly return to start.

Split Squat Overhead Press



1. Place left foot halfway along tubing and step right leg back 3-4 feet, bending left knee.
2. Squat down, keeping back slightly arched and knees behind feet.
3. Pushing right heel away from body until knee and hip are straight.
4. Pause, then slowly return to start.

T-Stand with Front Deltoid Raise



1. In a staggered stance, place right foot halfway along tubing. Bend knees slightly and lift right leg up and hold it straight out to the side. Stabilize torso.
2. Pushing right heel away from body until knee and hip are straight.
3. Pause, then slowly return to start.

Pointing Dog



1. On hands and knees, attach band to left foot and hold handles in right hand, tubing bent. Bend knees slightly and lift right leg up and hold it straight out to the side. Stabilize torso.
2. Pushing right heel away from body until knee and hip are straight.
3. Pause, then slowly return to start.

Upper Chop



1. Standing with right foot halfway along tubing, step forward 3-4 feet with left leg, bending front knee.
2. Turn to right, holding tubing in both hands beside right hip. Stabilize torso.
3. Keeping arms straight, move them upward toward left shoulder, rotating torso to left.
4. When body faces forward, hands forward and above head. Pause, then slowly return to start.

Twisting Crunch



1. Place door attachment lower knee length in door frame.
2. With right side toward door, grasp handle in right hand. Hold elbow by side, bend 90 degrees, with arm rotated toward door. Stabilize torso.
3. Moving from right shoulder, and keeping elbow by side, rotate right arm until forearm is across abdomen.
4. Pause, then slowly return to start.

Rotator Cuff



1. Place door attachment slightly above hip height in door frame.
2. With right side toward door, grasp handle in right hand. Hold elbow by side, bend 90 degrees, with arm rotated toward door. Stabilize torso.
3. Moving from right shoulder, and keeping elbow by side, rotate right arm until forearm is across abdomen.
4. Pause, then slowly return to start.

Lying Rotator Cuff



1. Lying on back, hold left leg in air with holding running around foot.
2. Bend a handle in each hand, elbows bent 90 degrees, forearms and hands at shoulder level, tubing bent. Stabilize torso.
3. Keeping left leg stiff and elbows on floor, rotate arms backward until hands touch floor. Pause, then slowly return to start.

Light Tubing Exercises



- UNDER BOTH FEET
 - Step Touch (single, double) (outer thigh)
 - Step Wide Hold – chest cross (pectorals, shoulders)
 - Double Pull back (traps, rhomboids)
 - Double Tube to ONE shoulder & rotate (core)
 - Lifts Side/Front Deltoid (aedial/anterior)
 - Bicep (single, double, full, half, rotate)
 - Deep Squats (quad, glutes, hip flexors, hams, core)

- LUNGES - UNDER ONE FOOT (BOTH HANDS)
 - Forward/Back (through the tube)
 - Forward – Bicep / Rotations
 - Back – Tricep / Posterior Delt
 - Inner Thigh – step across (side to side)
 - (hands low wide)
 - Balance

Creative Lunges Linear/Lateral



- LUNGE SIDE – TUBE UNDER 1 FOOT
 - Tap Together
 - Knee Lift
 - Tap Front
 - Tap Back
 - Knee in/forward
 - Knee out
 - Around the clock

- TRICEP & Rotators - UNDER ONE FOOT
 - Drop one side (confirm security)
 - Draw around back – Triceps (straight/angle)
 - Straight arm angle large wide side (rotators)
 - Unsheathe the Sword
 - Move unsupported leg cross-touch (inner thigh)

- LOOP ABOVE HEAD (in hands)
 - Loop Tube – handles in 1 hand, loop in other hand
 - Lift Above Head & Press Open In Front of Chest
 - NOT behind head (protect shoulders & posture)
 - Press out: low, med, high
 - Rotate wrist – work up, down, out, in, singles/doubles

Lower Body Flexibility & Cool Down



- Lunge back single leg - calve
 - Bend straighten back knee
 - Rise up on toe and lower
 - Pelvic tilt forward
- Lean Back - hamstring
 - Flat back, hands on upper thigh
 - Lift front toe (up, out, in, windshield wiper)
- Switch

Upper Body Flexibility & Cool Down



- ARMS/CHEST

- Bicep/Wrist (reach front elbow up/down, hand rotation)
- Triceps overhead/slightly in front (touch elbow)
- Open arms wide – stretch behind
- Reach behind (clasp hands – if possible)
- Roll Shoulders back
- Fingers
 - Open Close fingers, piano, fist-expand
 - Roll wrists

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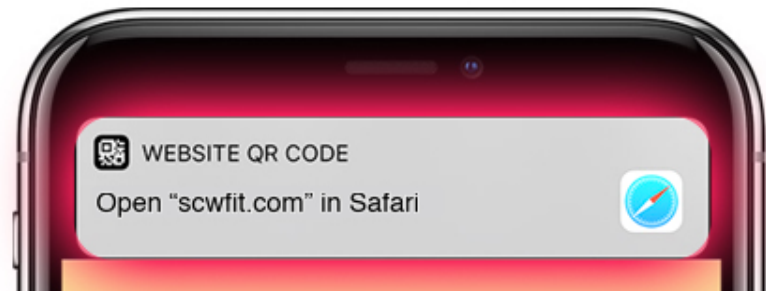
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