

Preventive and Rehabilitative Exercise

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Schutte conducted observations of the firefighting environment as well as preseason screening tests of firefighters to determine the need for preventive and rehabilitative exercise programs. The outcome of that review was a series of exercises designed to

strengthen and protect the ankles, knees, and backs of firefighters. The exercises may be used for the prevention or the rehabilitation of injuries.

Ankle Exercise Program

The ankle exercise program consists of three parts: stretching, strengthening, and balance. These exercises should be performed three times per week: stretches first, followed by strengthening, followed by balance work. If possible, warm up on an exercise bike for 3 to 5 minutes beforehand.

1
Calf Stretch
10 repetitions

Towel-Assisted Stretching

Resist
Push
A
Hold 10 seconds
Relax
Pull
B
Hold 10 seconds

4
Inversion
3 sets of 10 repetitions
(Use maximum weight possible)

Ankle Strengthening

Hold 6 seconds

2
Tibialis Stretch
10 repetitions

Resist
A
Twist ankle
Hold 10 seconds
Relax ankle
Pull
B
Hold 10 seconds

5
Eversion
3 sets of 10 repetitions
(Use maximum weight possible)

Hold 6 seconds

3
Peroneal Stretch
10 repetitions

Resist
A
Twist ankle
Hold 10 seconds
Relax ankle
Pull
B
Hold 10 seconds

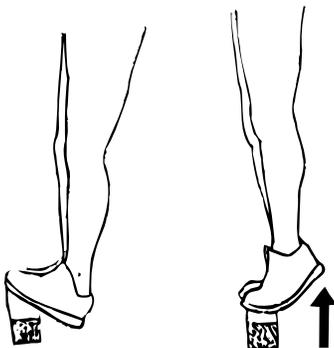
6
Dorsi Flexion
3 sets of 10 repetitions
(Use maximum weight possible)

Hold 6 seconds

Note: Tape weight on front of weight boot or hang weight from toe.

7

Plantar Flexion
3 sets of
25 repetitions

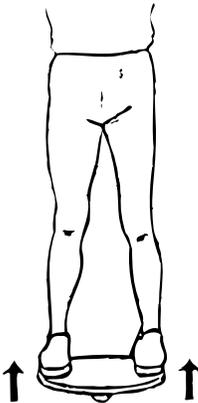


Begin with both legs and progress to one leg at a time

8

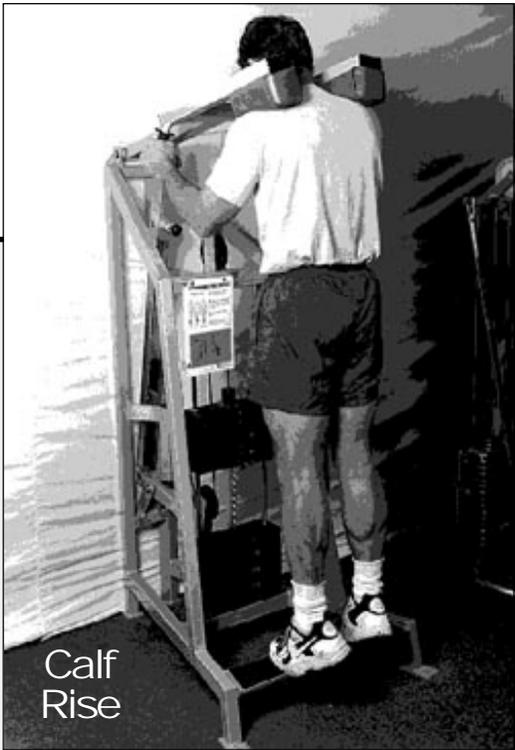
Ankle Balance

Ankle Balance
10 repetitions



Hold 15 seconds

Progress to one leg at a time



Calf Rise

Knee Exercises

The knee exercise program consists of three parts: (1) hamstring flexibility, (2) free weight exercise program, (3) exercise biking.

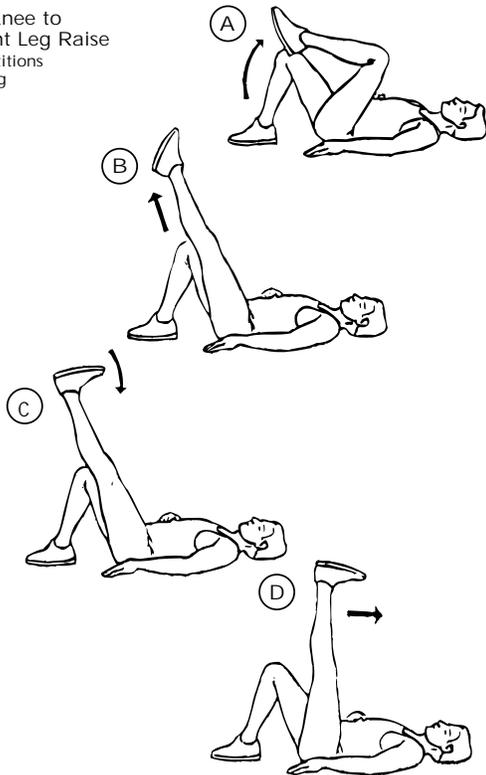
Recommended Knee Program Sequence:

- a. Exercise bike: 3 to 5 minute warmup
- b. Hamstring stretch, (bent knee to straight leg raise)
- c. Free weight program
- d. Exercise bike: 20 to 25 minutes
- e. Hamstring stretch, (bent knee to straight leg raise)

1

Hamstring Flexibility

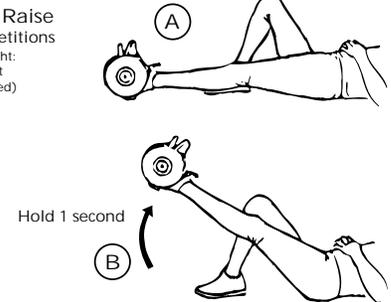
Bent Knee to
Straight Leg Raise
10 repetitions
Each Leg



2

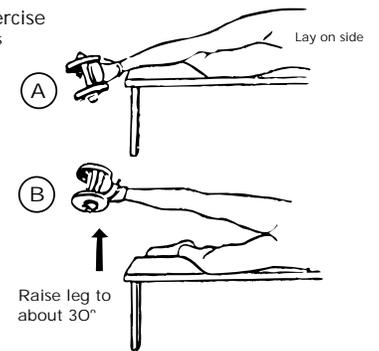
Free Weight Exercises

Straight Leg Raise
3 sets of 15 repetitions
Recommended weight:
10% of body weight
(less if knee is injured)



3

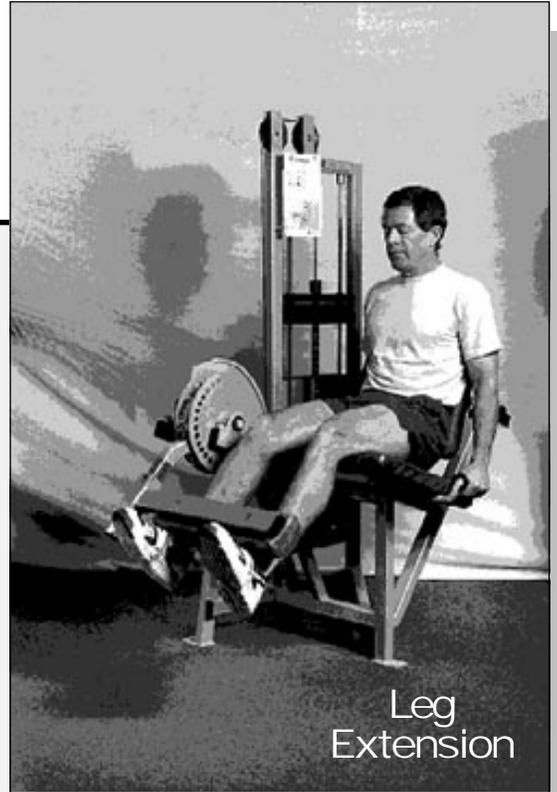
Hip Abduction Exercise
3 sets of 15 repetitions
Recommended weight:
10% of body weight
(less if knee is injured)





Exercise Biking

Adjust seat height so leg is almost fully extended at bottom of stroke.
 Ride bike for 20 to 25 minutes four times per week.
 Try to maintain 80 to 95 revolutions per minute.

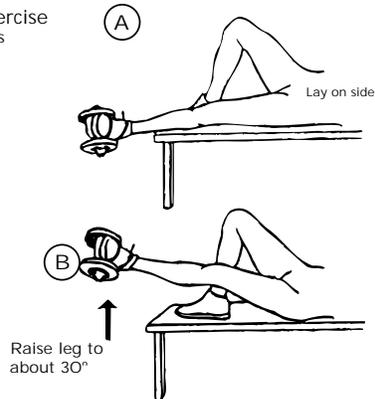


Leg Extension

4

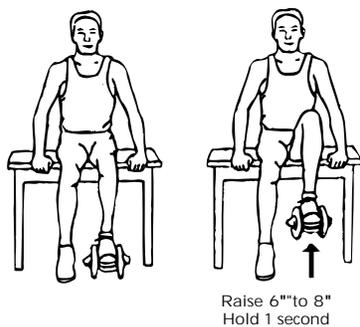
Free Weight Exercises

Hip Adduction Exercise
 3 sets of 15 repetitions
 Recommended weight:
 10% of body weight
 (less if knee is injured)



5

Hip Flexion
 3 sets of 15 repetitions
 Recommended weight:
 10% of body weight
 (less if knee is injured)



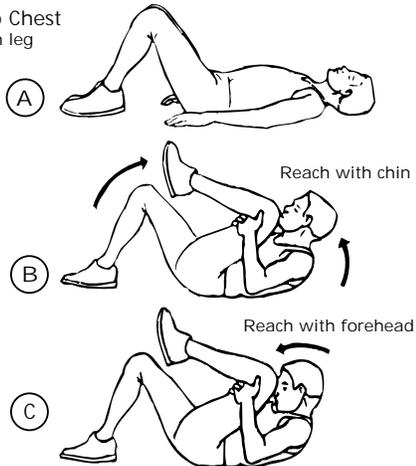
Those with knee problems, such as "runner's knee" or patella femoral syndrome, should run less and incorporate alternative aerobic exercises into their training program. Road and mountain biking, hiking, cross-country skiing, and swimming provide conditioning while reducing stress on the knee.

Back Exercises

The goal of the back exercise program is twofold: to improve abdominal muscle strength, and to improve flexibility of the lower back, hamstrings, and Achilles tendon. It is important to realize that the hamstrings and the lower back may work against each other, and inflexibility of either can result in lower back pain.

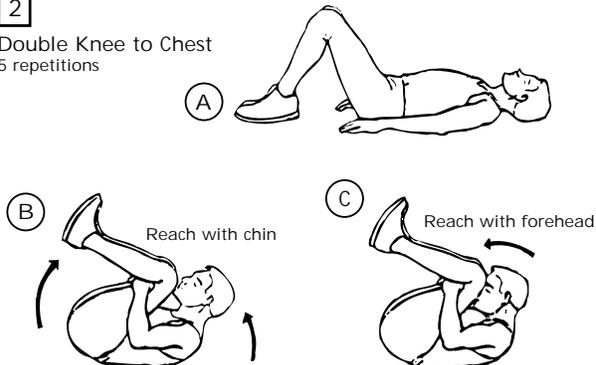
1

Single Knee to Chest
5 repetitions each leg



2

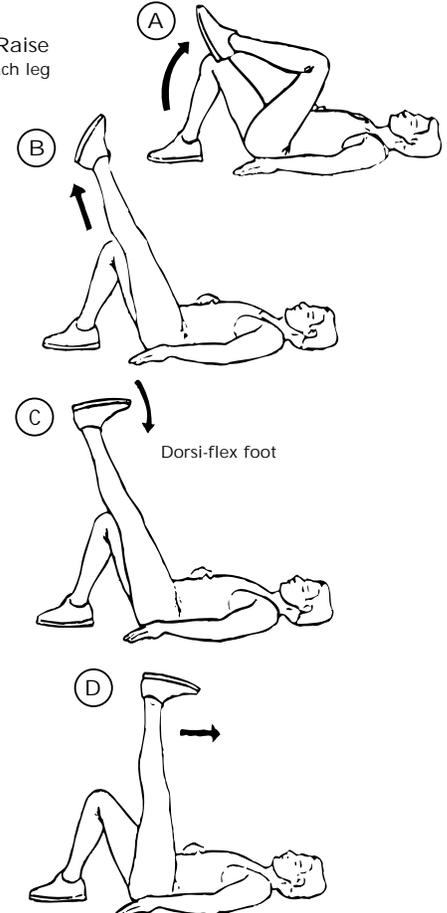
Double Knee to Chest
5 repetitions



3

(Important Hamstring Stretch)

Bent Knee to
Straight Leg Raise
10 repetitions each leg



4

Curl Up (modified situp)
10 repetitions

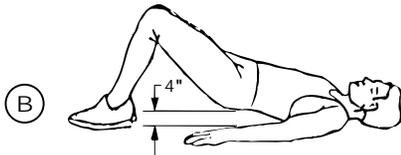


Tuck chin, curl back
Do not raise back above 45°

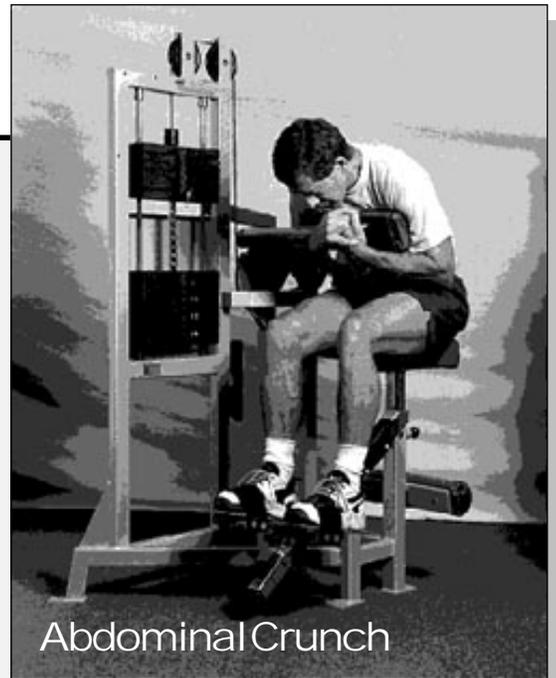


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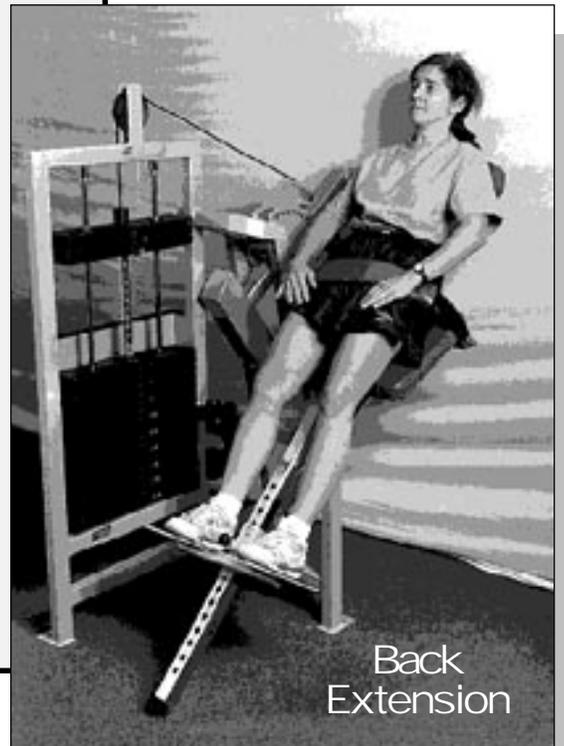
Butt Up
10 repetitions



Raise no higher than 4 inches.
Hold 1 second.



Abdominal Crunch



Back Extension

