

### Exercise Stress Testing

#### Common Treadmill Exercise Protocols

Table 1. Bruce protocol

Stage	Mins.	Speed, mph	Grade, %
1	3	1.7	10
2	6	2.5	12
3	9	3.4	14
4	12	4.2	16
5	15	5.0	18
6	18	5.5	20
7	21	6.0	22

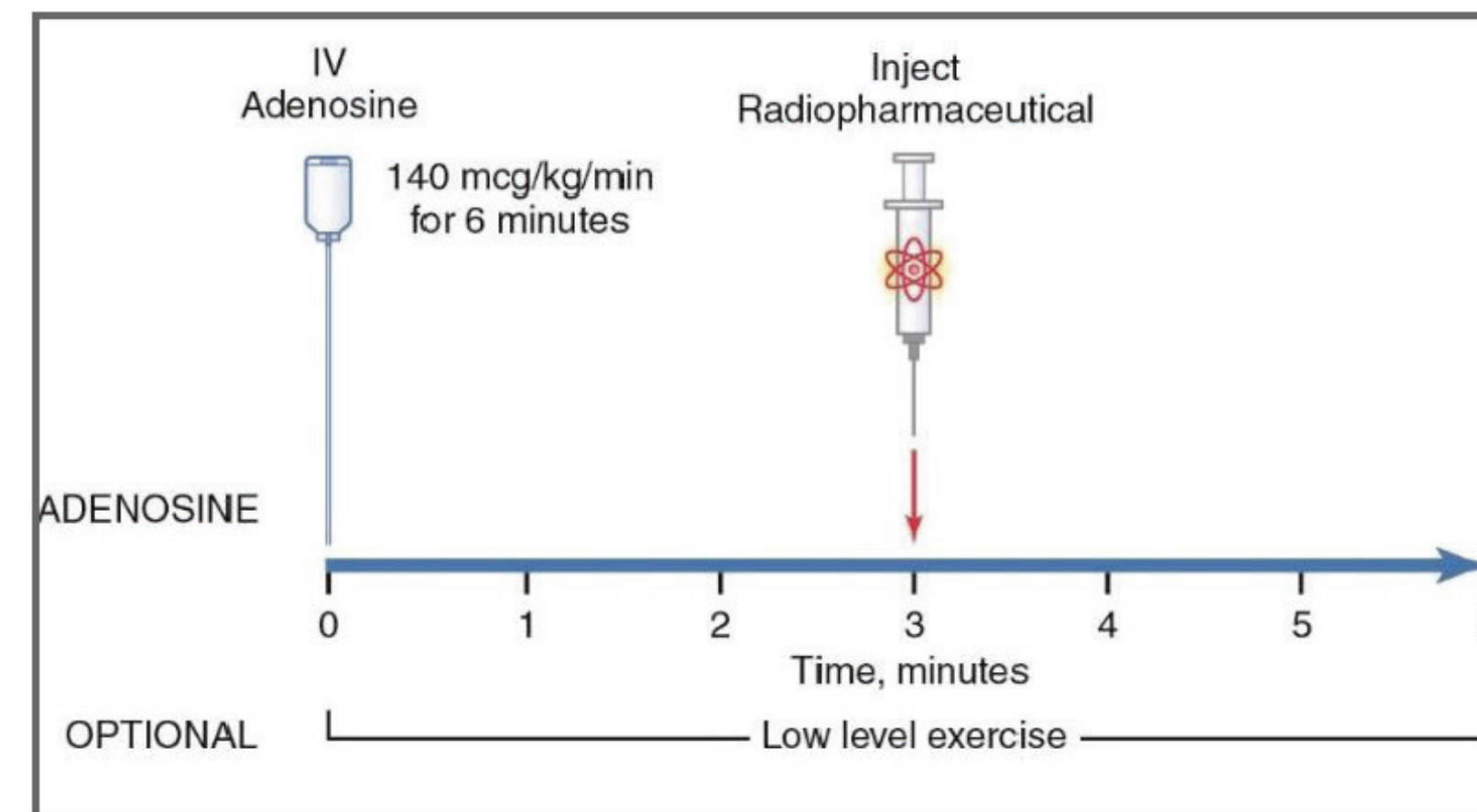
Table 2. Modified Bruce Protocol

Stage	Mins.	Speed, mph	Grade, %
0	3	1.7	0
1/2	6	1.7	5
1	9	1.7	10
2	12	2.5	12
3	15	3.4	14
4	18	4.2	16
5	21	5.0	18
6	24	5.5	20
7	27	6.0	22

The endpoint of all exercise tests should be symptoms (moderate to severe chest pain, excessive shortness of breath, fatigue) or high-risk findings (severe ST segment changes, hypo/hypertension, arrhythmia, etc.). Achievement of 85% of maximum, age-adjusted, predicted HR alone is not an indication for test termination.

### Pharmacologic Stress Testing (Schematics Refer to SPECT Imaging)

#### Adenosine

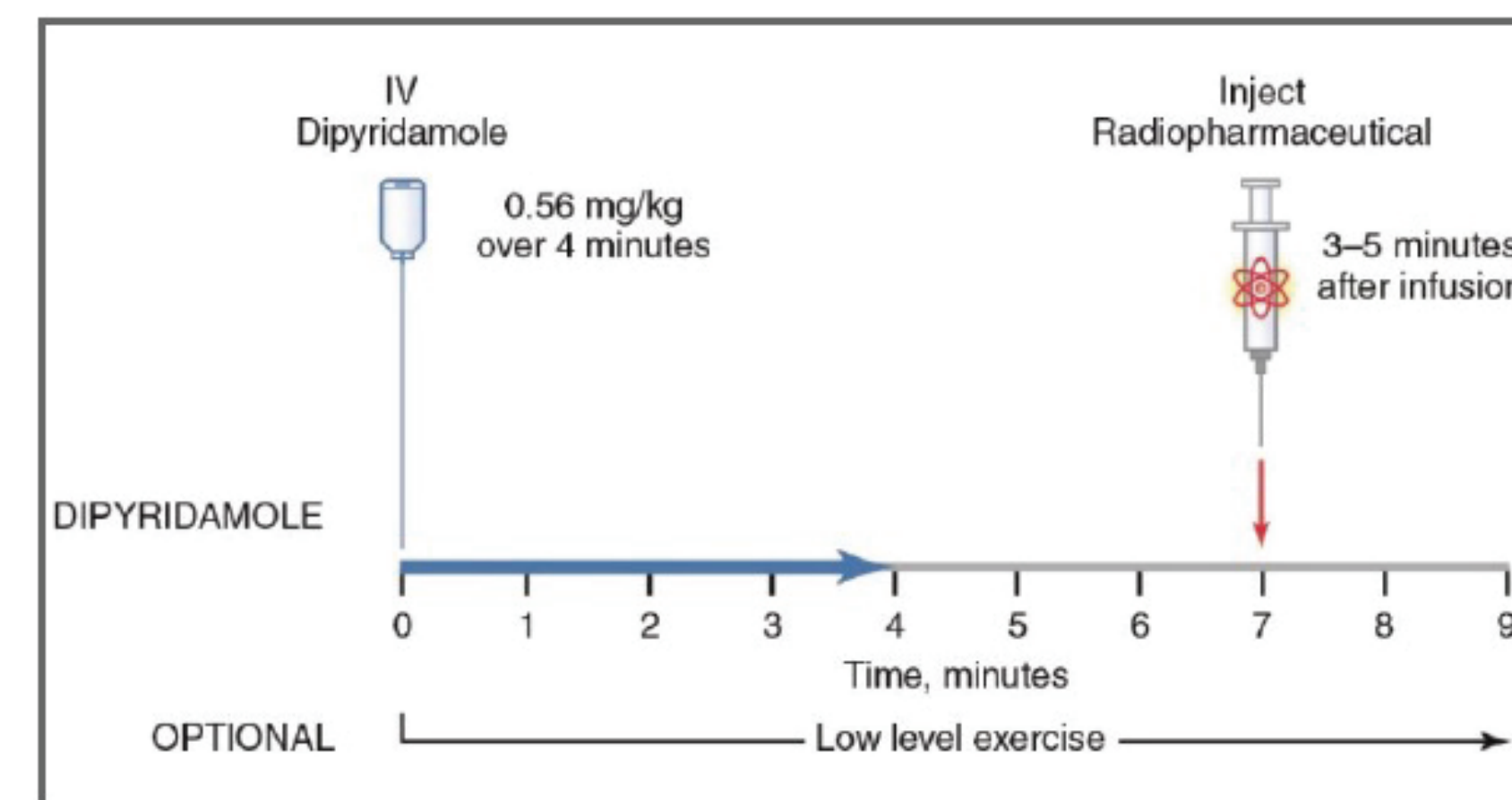


#### Common Side Effects

AV block	8%
Second degree AV block	4%
Complete heart block	<1%
ST-T depression of $\geq 1$ mm	5-7%

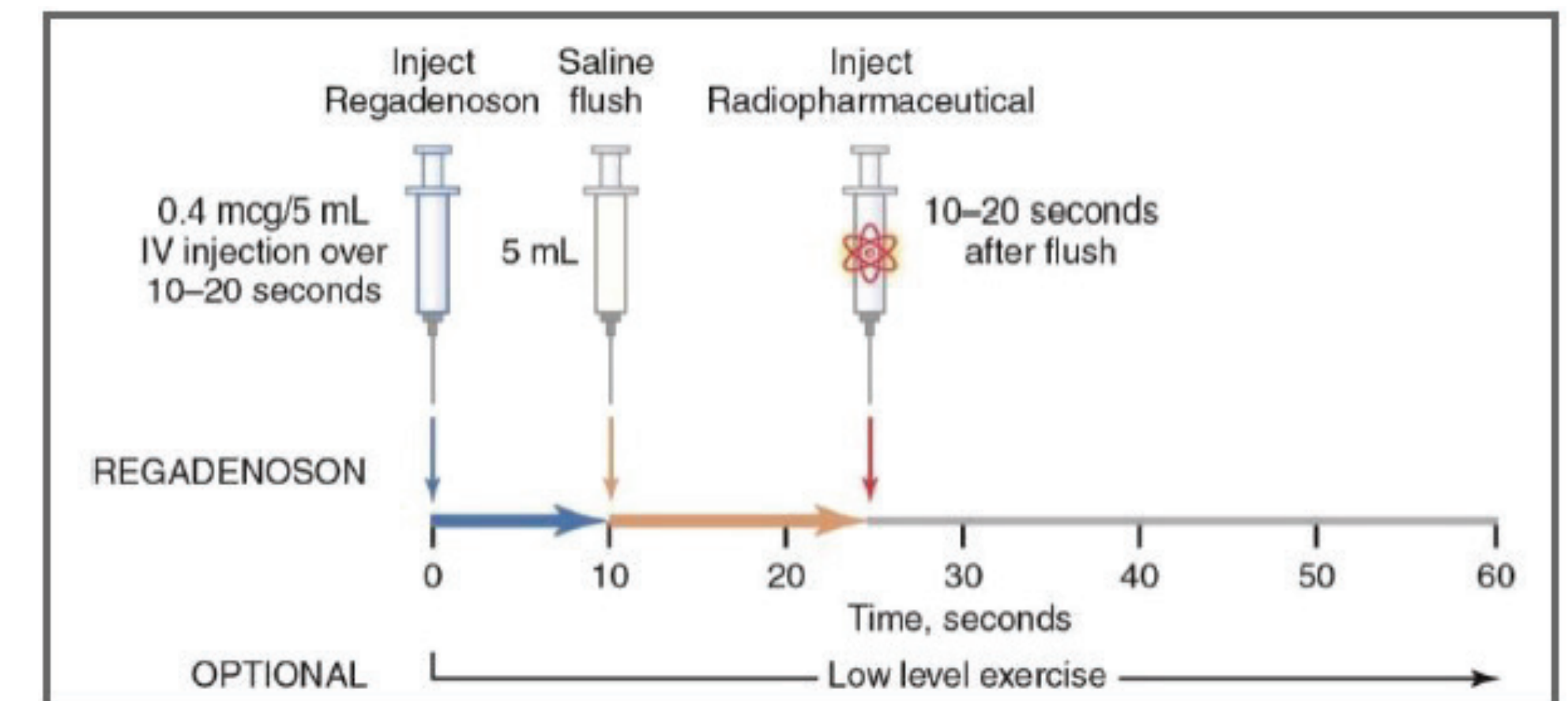
Use with caution or avoid in patients with reactive airway disease. Due to its extremely short half-life (< 10 seconds), most side effects resolve a few seconds after discontinuation of adenosine, and aminophylline is only rarely required.

#### Dipyridamole



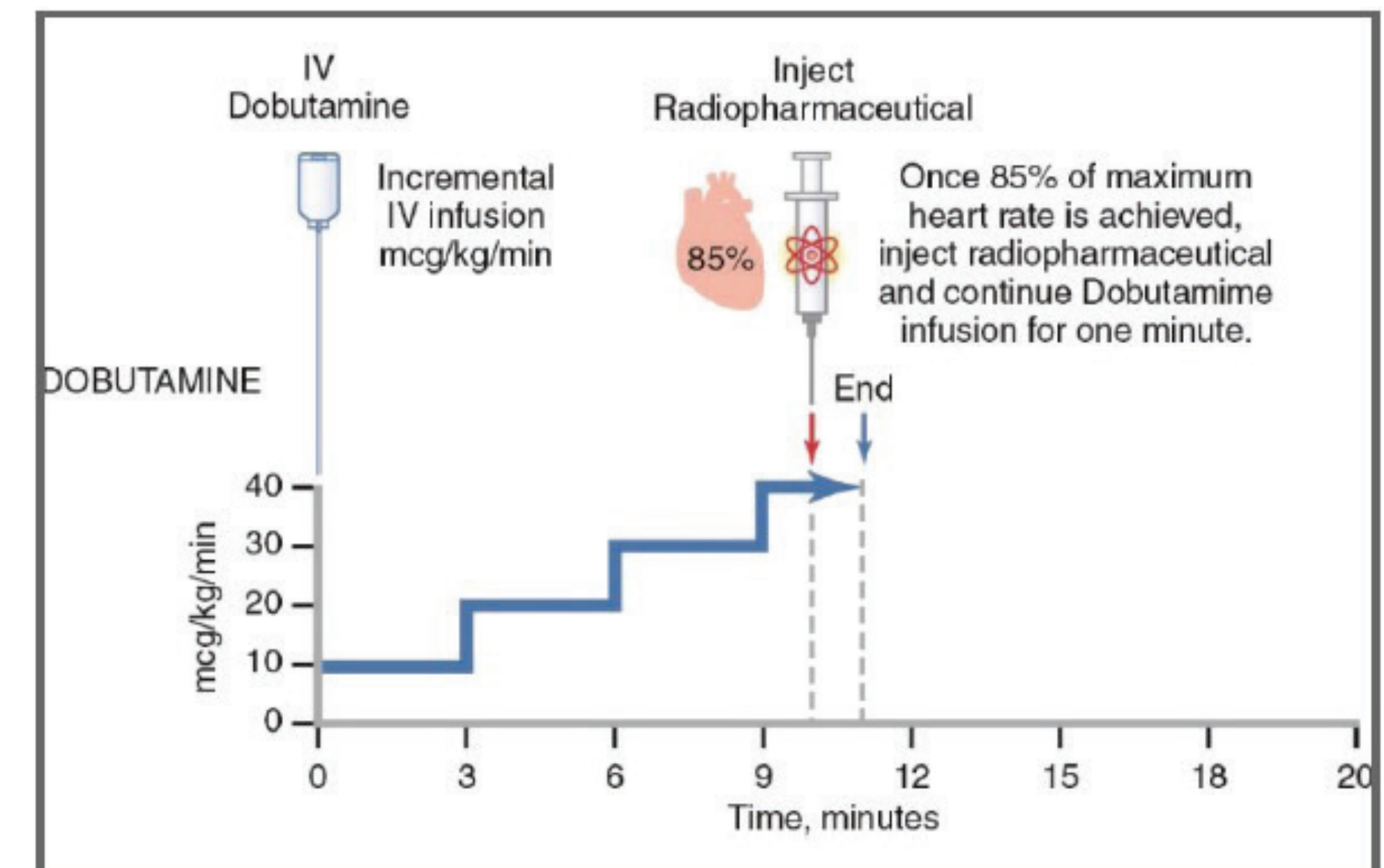
Aminophylline is often required to reverse its side effects.

#### Regadenoson



Regadenoson is generally safe in reactive airway disease, but bronchoconstriction can rarely occur. Most adverse reactions begin soon after dosing and typically resolve within 15 min. Regadenoson and aminophylline are contraindicated with seizure disorder.

#### Dobutamine



Dobutamine is safe in patients with significant reactive airway disease or severe obstructive pulmonary disease but should be avoided in the setting of hypertension or tachyarrhythmia. Appropriate clinical supervision is needed.