

as neuroprotective agents within the context of Parkinson's disease will prevent the development of symptoms associated with MPTP exposure. Alternatively, compounds capable of preserving dopamine function can be identified by dosing the animals with test compounds after MPTP administration, but prior to symptom onset. Compounds capable of preserving dopamine function will demonstrate a decreased level of parkinsonian-type symptoms.

## **Animal Models of Cardiovascular Disease**

Despite decades of research, cardiovascular disease remains the number one cause of death. Cardiovascular disease as a whole contributes to a larger number of deaths than that of HIV and cancer combined. There are, of course, many aspects and contributing factors to the development of cardiovascular disease as well as many different subtypes of cardiovascular disease. Multiple animal models have been developed in order to study, understand, and develop therapies for the treatment of the different facets of cardiovascular disease. The following exemplary models provide a glimpse of the complex and often time-consuming animal models employed in the search for novel treatments.

### ***Models of Hypertension***

Of the various risk factors associated with myocardial infarction, heart failure, and strokes, the most important is hypertension, a chronic condition in which blood pressure is elevated (greater than 140/90 mmHg). It is estimated that in 2008, complications associated with hypertension accounted for approximately 9.4 million deaths, and that over 1 billion people were living with this condition, diagnosed or otherwise.<sup>24</sup> Given the importance of this condition, it should come as no surprise that a substantial amount of effort has been devoted to the identification of novel antihypertensive agents. Animal models of hypertension have been developed using surgical methods, pharmacological induction, and genetic manipulation. In the surgical model, hypertension can be established by constriction of the renal artery (the 2K1C model, [Figure 7.8](#)). This leads to a chronic increase in blood pressure that plateaus in 2–3 weeks. Hypertension in mice, rats, rabbits, dogs, pigs, and non-human primates have been studied using surgical intervention of this type.<sup>25</sup>

Pharmacologically established animal models of hypertension, on the other hand, are often produced using chronic administration of mineralocorticoids,