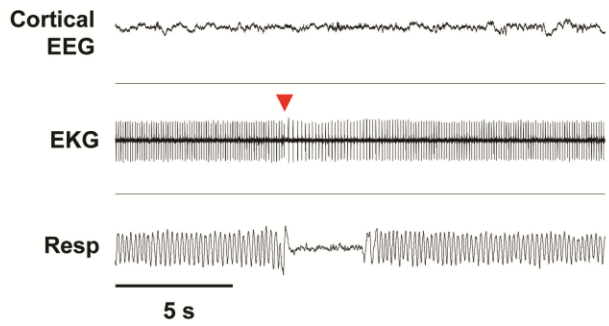
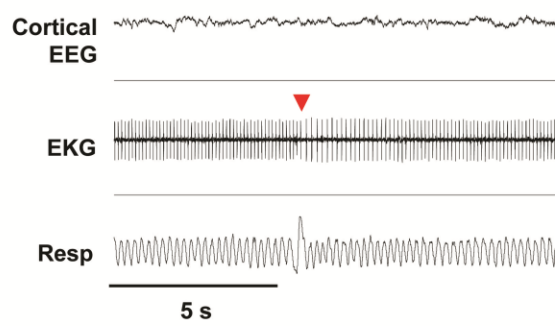


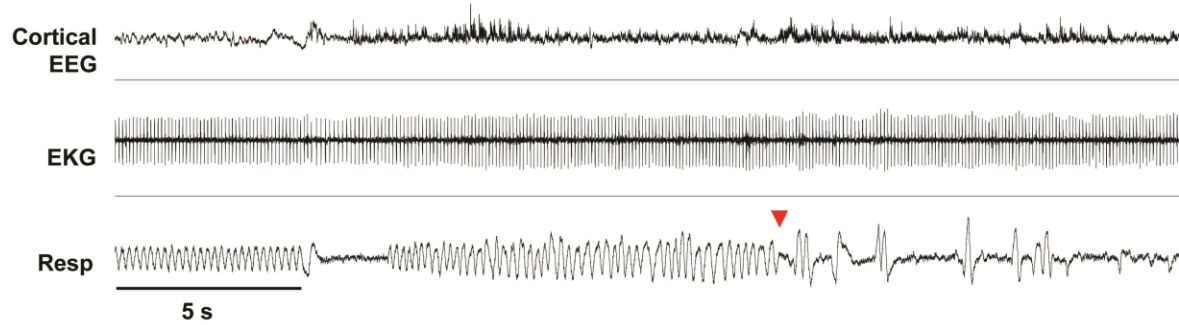
a. Interictal apneic bradycardia



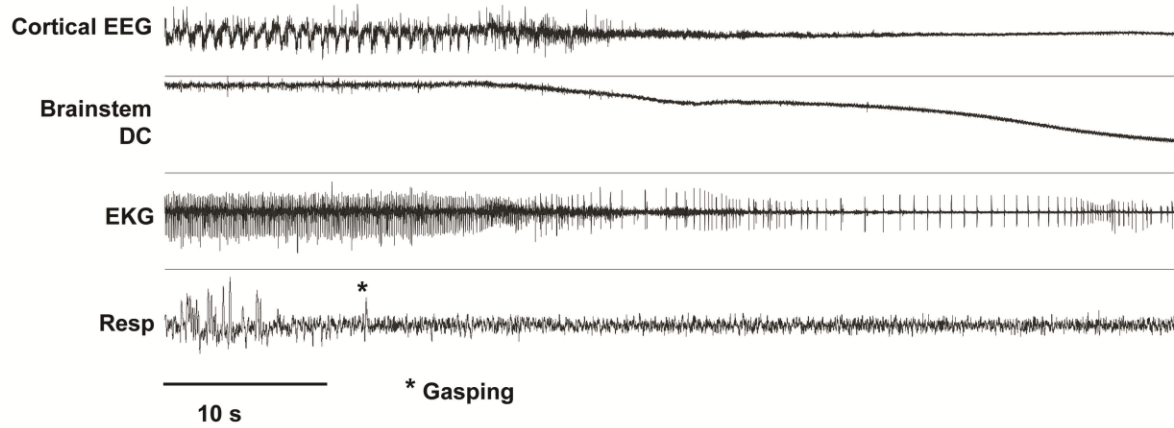
b. Interictal bradycardia



c. Cortical spikes and onset of recurrent apnea, occasional bradycardia

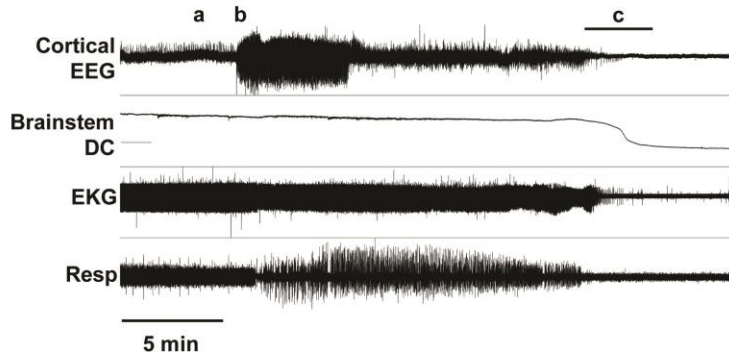


d. Development of Brainstem DC potential shift and terminal cardiorespiratory responses

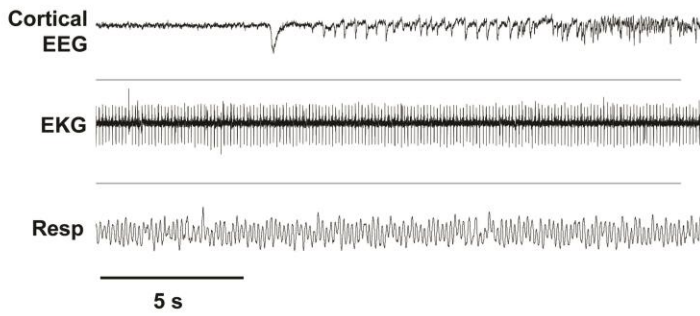


Supplementary figure 1. Seizure monitoring in Kv1.1 KO presented in **Fig. 1D** and **Fig. 3B**. Seizure terminates with brainstem SD and death. **A.** Recording of mouse shown in Fig. 1D with expanded traces shown in **a-d**. **a.** Bradycardia (red arrow) coincided with apnea. **b.** A brief bradycardia without apnea. **c.** Cortical spikes accompanied by apnea and bradycardia. Note poor recovery of respiratory tone following the second episode (red arrow). Irregular respiration pattern continued through subsequent cortical seizures and death (see **Fig. 1D**). **d.** expanded trace showing development of degenerative cardiorespiratory arrhythmias and initial appearance of negative DC potential shift in brainstem. Gasping is indicated by asterisk.

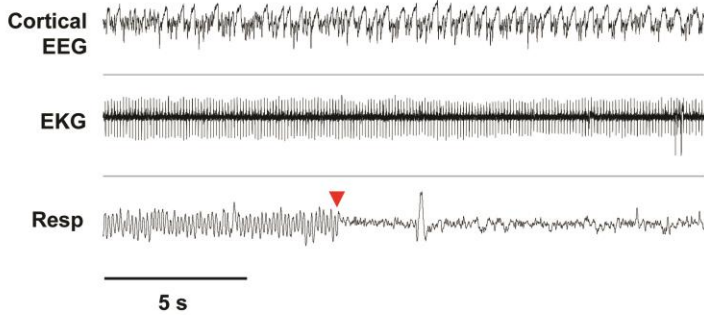
A



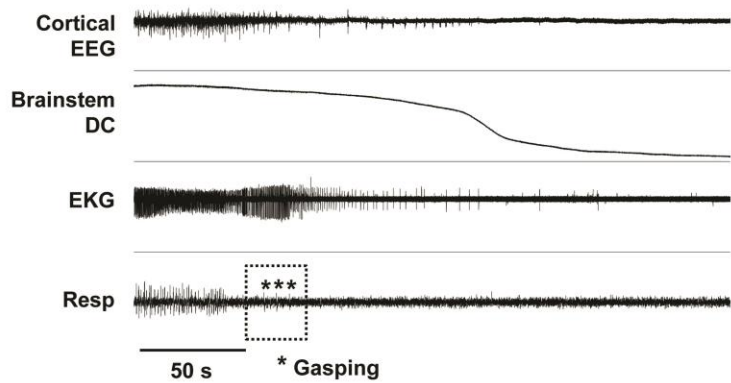
a. Seizure onset without cardiorespiratory abnormality



b. Onset of agonal breathing without cardiac abnormality



c. Development of Brainstem DC potential shift and terminal cardiorespiratory responses



Supplementary figure 2. Seizure monitoring in second Kv1.1 KO presented in **Fig. 1E** and **Fig. 3C**. Brainstem SD and sudden death appeared >10 minutes following the termination of the last seizure. **A.** Recording of mouse shown in Fig. 1E with expanded traces shown in **a-c**. **a.** Cortical seizure did not disturb normal respiration in early phase. **b.** sudden onset of prolonged respiratory arrest and during seizure. Apnea and occasional large respiratory gasping continued (see **Fig 1E**). **c.** expanded trace showing development of degenerative cardiorespiratory arrhythmias and initial appearance of negative DC potential shift in brainstem. Gasping is indicated by asterisks and further expanded trace.

Supplementary movie 1. IOS in Kv1.1 KO brainstem slice showing wave (light, then dark) progressing from lateral border of NTS to engulf NTS and dorsal nucleus of vagus (X).

Supplementary file 1. Raw data.