Supporting information

A Dual-Mode Wearable Sensor with Electrophysiology and Pressure Sensing for Cuffless Blood Pressure Monitoring

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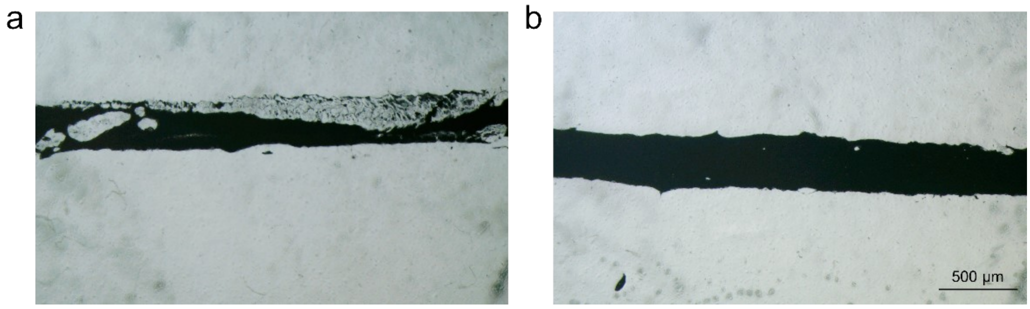

Fig. S1 Photo of the liquid metal circuit made by (a) blade coating and (b) magnetic printing method.

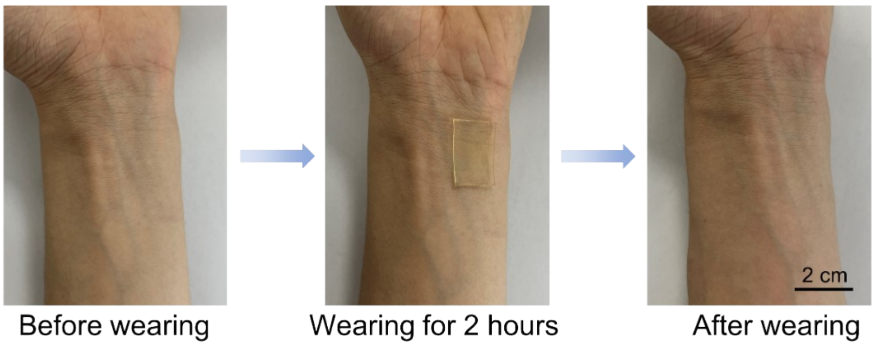

Fig. S2 Photos showing the skin state before and after wearing the ionogel for 2 hours.

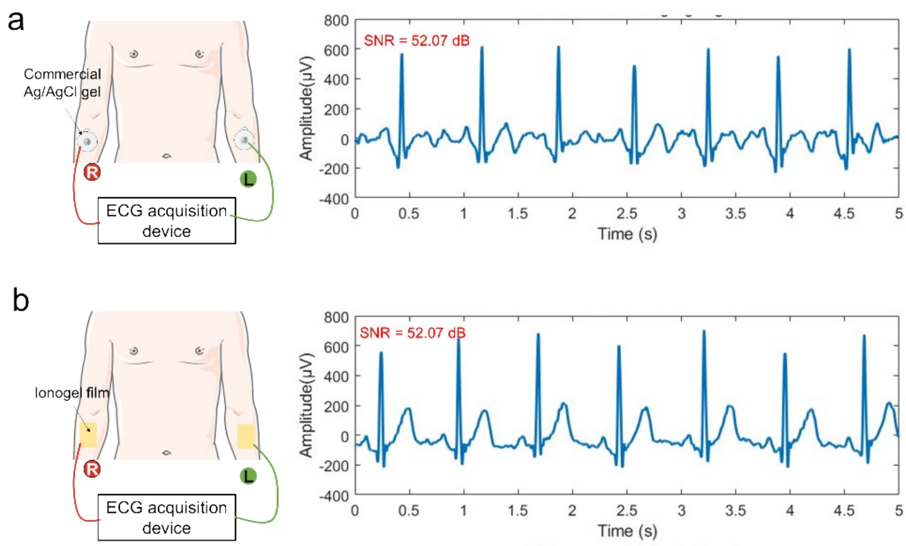

Fig. S3 ECG signals were collected using (a) ionogels and (b) commercial Ag/AgCl gel electrodes.

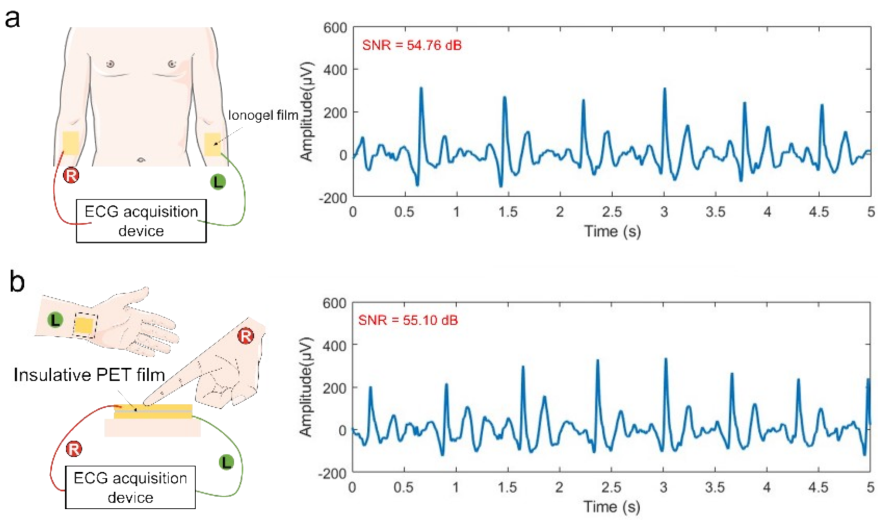

Fig. S4 ECG signals were collected by wearing the ionogel films on two arms (a) and (b) the left wrist with the right finger contacting the the top ionogel film.

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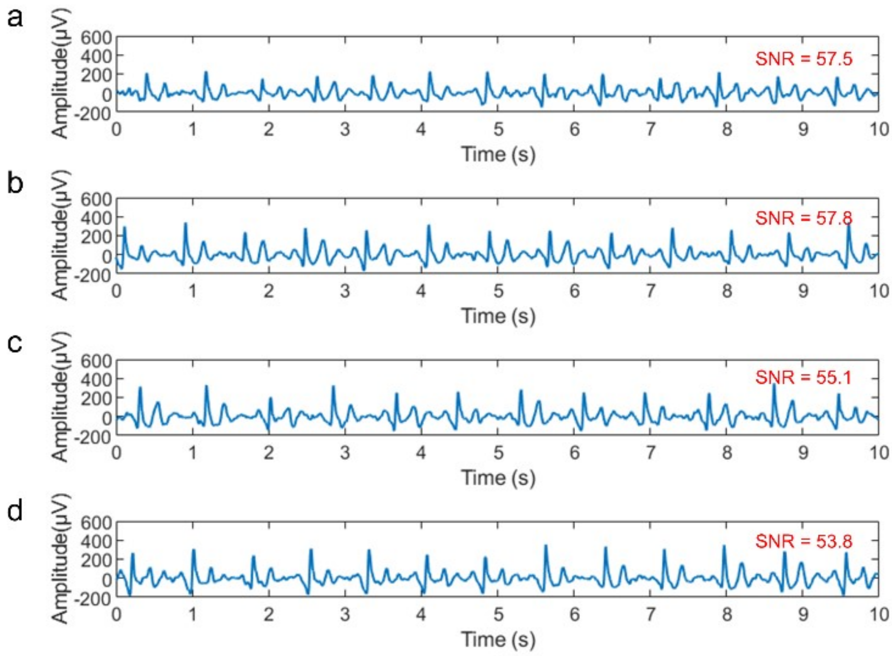

Fig. S5 ECG signals were collected after wearing ionogels for (a) 0, (b) 2, (c) 4, and (d) 6 hours.

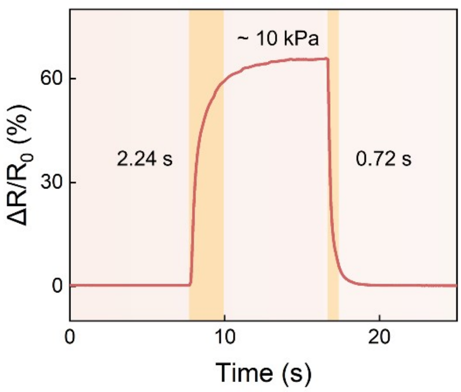

Fig. S6 Response and recovery time for 90 % resistance change under pressure of 10 kPa.

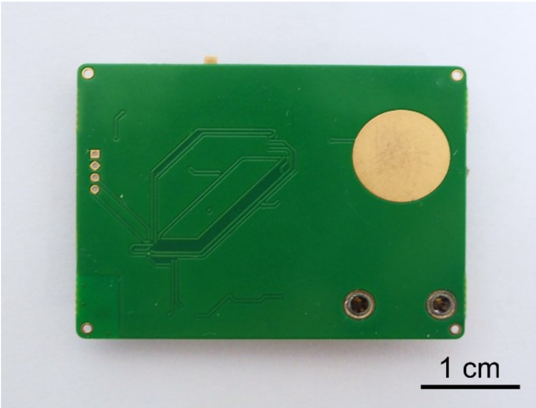

Fig. S7 Photos showing the back of the PCB board.

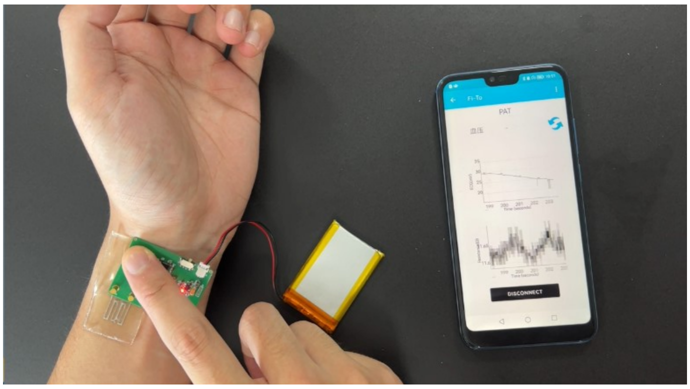

Fig. S8 Photograph showing the simultaneous detection of both the pulse and ECG signals and wireless signal transmission based on Bluetooth.

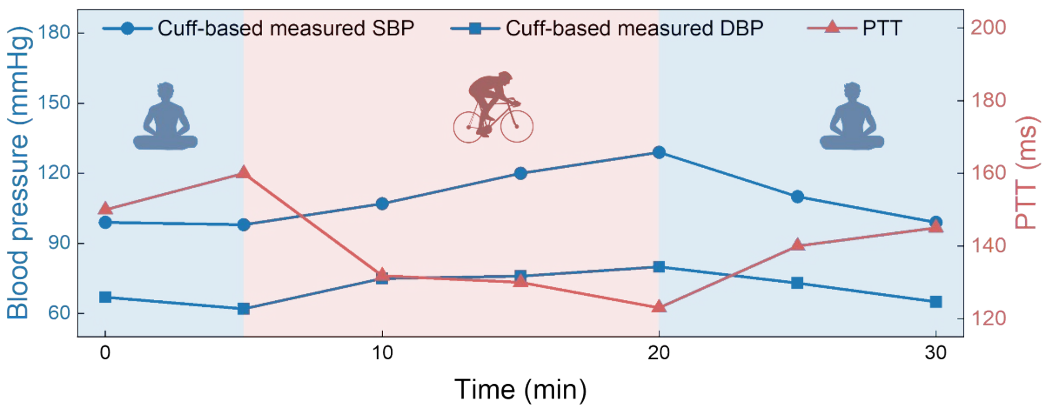

Fig. S9 Blood pressure was measured by a commercial sphygmomanometer and PTT was collected by the dual-mode sensing system during rest and exercise states.

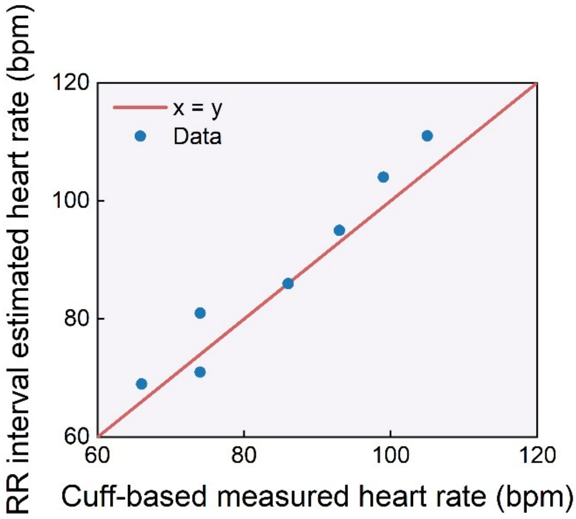

Fig. S10 Results of regression analysis between measured and estimated values of the heart rate.

Table 1. Comparison of continuous BP monitoring devices.

Methods	Accuracy DBP (mmHg) ME	Accuracy DBP (mmHg) SD	Accuracy SBP (mmHg) ME	Accuracy SBP (mmHg) SD	Sensors	Signal transmission	Wearable mode
PPG+ECG[1]	3.23	4.75	4.43	6.09	Commercial PPG sensor and ECG electrodes.	Wired	PPG sensor was worn on one finger and ECG electrodes were placed on two wrists and an ankle.
Bioimpedance[2]	0.2	4.5	0.2	5.8	Graphene electronic tattoos as human bioelectronic interfaces	Wired	Three tattoo pairs were placed onto the wrist over the radial and ulnar arteries, both branching out of the brachial artery.
Pulse at one position[3]	-0.89	6.19	-0.32	5.28	Perovskite structure $Pb(Zr_{0.52}Ti_{0.48})O_3$ based piezoelectric pressure sensor.	Wireless	A pulse sensor was worn on one wrist.
Pulses at two positions[4]	0.11	3.68	-0.05	4.61	Lead zirconate titanate based piezoelectric pressure sensor.	Wireless	A wristband was worn on one wrist.
This work	0.0	1.52	0.0	2.98	Dual-mode sensor composed of ionogel embedded LM circuit	Wireless	A dual-mode sensor were worn on one wrist.

Supplementary References

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