

Supplementary Material

TITLE

Impact of Early Blood Pressure Reduction on Prognosis in ICU Patients with Severe Acute Hypertension: A Retrospective Study of the Medical Information Mart for Intensive Care IV (MIMIC-IV) Database

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Footnotes

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Table S1. ICD-9 and ICD-10 codes for diagnoses, comorbidities, and clinical indications.

Disease	ICD 9/10 Code
Prior hypertension	4010, 4011, 4019, 4372, 36042, 36211, 40200, 40201, 40210, 40211, 40290, 40291, 40300, 40301, 40310, 40311, 40390, 40391, 40400, 40401, 40402, 40403, 40410, 40411, 40412, 40413, 40490, 40491, 40492, 40493, 40501, 40511, 40519, 40591, 40599, 64210, 64211, 64212, 64213, 64214, 64220, 64221, 64222, 64223, 64224, 99791, H3503, H35031, H35032, H35033, H35039, I10, I11, I110, I119, I12, I120, I129, I13, I130, I131, I1310, I1311, I132, I15, I150, I151, I152, I158, I159, I16, I160, I161, I169, I674, O10, O100, O1001, O10011, O10012, O10013, O10019, O1003, O101, O1011, O10111, O10112, O10113, O10119, O1012, O1013, O102, O1021, O10211, O10212, O10213, O10219, O1022, O1023, O103, O1031, O10311, O10312, O10319, O1032, O1033, O10419, O1042, O1043, O165
Hypertensive retinopathy	36042, 36211, H3503 , H35031 , H35032 , H35033 , H35039
Hypertensive encephalopathy	4372, I674
HHD	40300, 40301, 40310, 40311, 40390, 40391, I12 , I120 , I129 , O102 , O1021 , O10211 , O10212 , O10213 , O10219 , O1022 , O1023
HKD	40300, 40301, 40310, 40311, 40390, 40391, I12 , I120 , I129 , O102 , O1021 , O10211 , O10212 , O10213 , O10219 , O1022 , O1023
HHD & HKD	40400, 40401, 40402, 40403, 40410, 40411, 40412, 40413, 40490, 40491, 40492, 40493, I13 , I130 , I131 , I1310 , I1311 , I132 , O103 , O1031 , O10311 , O10312 , O10319 , O1032 , O1033
Hypertensive emergency	4010, 40200, 40201, 40300, 40301, 40400, 40401, 40403, 40501, 40509, I161, I169
Pregnancy	O090, O0900, O0901, O0902, O0903, O091, O0910, O0911, O0912, O0913, O09512, O09519, O0952, O09619, O0962, O09629, O119, O1200, O1210, O1420, O16, O169, O2210, O2220, O2230, O2240, O2250, O228X9, O2300, O2310, O2320, O2330, O23519, O23529, O23599, O2510, O260, O2600, O2601, O2602, O2603, O261, O2610, O2611, O2612, O2613, O263, O2630, O2631, O2632, O2633, O26619, O26719, O268, O26849, O26879, O2689, O29099, O29199, O29299, O293X9, O2960, O298X9, O2990, O3100, O34539, O3480, O354XX2, O354XX3, O354XX4, O354XX9, O356XX0, O356XX9, O357XX2, O357XX3, O357XX5, O358XX5, O3601, O36011, O360110, O360111, O360112, O360113, O360114, O360115, O360119, O36012, O360120, O360121, O360122, O360123, O360124, O360129, O36013, O360131, O360132, O360133, O360134, O360135, O360139, O36019, O360190, O360191, O360192, O360193, O360194, O360195, O360199, O36092, O36099, O3611, O36111, O361110, O361111, O361112, O361113, O361114, O361115, O361119, O36112, O361120, O361121, O361122, O361123, O361124, O361125, O361129, O361131, O361132, O361133, O361134, O361135, O361139, O36119, O361190, O361191, O361192, O361193, O361194, O361195, O361199, O36199, O361990, O361993, O361994, O361995, O3620X1, O3620X2, O3620X3, O3620X4, O3620X5, O365110, O365111, O365120, O365121, O365130, O36591, O365910, O365911, O365912, O365913, O365914, O365915, O36592, O365920, O365921, O365922, O365923, O365924, O365925, O36593, O365930, O365931, O365932, O365933, O365934, O365935, O36599, O365990, O365991, O365993, O365994, O365995, O36819, O368190, O368191, O368192, O368193, O368194, O368195, O36839, O36899, O368990, O3690, O409XX0, O4100X0, O4100X1, O4100X3, O4100X4, O4100X5, O41129, O41149, O411494, O43029, O43219, O43229, O43819, O43899, O4420, O4700, O6020X9, O655, O659, O88019, O88119, O988, O9881, O98811, O98812, O98813, O98819, O9882, O98911, O9A3, O9A31, O9A311, O9A312, O9A313, O9A41, O9A5, O9A51, O9A511, V1521, V222, V230, V2342, V2385, V2386, V616, V617, Z317, Z33, Z331, Z333, Z3402, Z3490, Z3A08, Z3A09, Z3A10, Z3A11, Z3A12, Z3A13, Z3A14, Z3A15, Z3A16, Z3A17, Z3A18, Z3A19, Z3A20, Z3A21, Z3A22, Z3A23, Z3A26, Z3A27, Z3A28, Z3A29, Z3A30, Z3A31, Z3A32, Z3A33, Z3A34, Z3A35, Z3A36, Z3A37, Z3A38, Z3A39, Z3A41, Z3A42, Z640, 63301, 63311, 63321, 63381, 63391, 64080, 64081, 64083, 64090, 64091, 64093, 64200, 64201, 64202, 64203, 64204, 64210, 64211, 64212, 64213, 64214, 64220, 64221, 64222, 64223, 64224, 64230, 64231, 64232, 64233, 64234, 64290, 64291, 64292, 64293, 64294, 64300, 64301, 64303, 64310, 64311, 64313, 64320, 64321, 64323, 64380, 64381, 64383, 64390, 64391, 64393, 64510, 64511, 64513, 64520, 64521, 64523, 64610, 64611, 64612, 64613, 64614, 64620, 64621, 64622, 64623, 64624, 64640, 64641, 64642, 64650, 64651, 64652, 64660, 64661, 64662, 64663, 64664, 64670, 64671, 64673, 64680, 64681, 64682, 64683, 64684, 64690, 64691, 64693, 64700, 64701, 64702, 64703, 64704, 64710, 64711, 64712, 64713, 64714, 64720, 64721, 64722, 64723, 64724, 64730, 64731, 64732, 64733, 64734, 64800, 64801, 64802, 64803, 64804, 64900, 64901, 64902, 64903, 64904, 64910, 64911, 64912, 64913, 64914, 64920, 64921, 64922, 64923, 64924, 64930, 64931, 64932, 64933, 64934, 64940, 64941, 64942, 64943, 64944, 64950, 64951, 64953, 64981, 64982, 65100, 65101, 65103, 65110, 65111, 65113, 65120, 65121, 65123, 65130,

Disease	ICD 9/10 Code
	<p>65131, 65133, 65140, 65141, 65143, 65150, 65151, 65153, 65160, 65161, 65163, 65170, 65171, 65173, 65180, 65181, 65183, 65190, 65191, 65193, 65260, 65261, 65263, 65430, 65431, 65432, 65433, 65434, 65440, 65441, 65442, 65443, 65444, 65960, 65961, 65963, 67100, 67101, 67102, 67103, 67104, 67110, 67111, 67112, 67113, 67114, 67120, 67121, 67122, 67123, 67124, 67150, 67151, 67152, 67153, 67154, 67180, 67181, 67182, 67183, 67184, 67190, 67191, 67192, 67193, 67194, 677, 7614, 7615, 7618, 7619, 76400, 76410, 76520, 76521, 76522, 76523, 76524, 76525, 76526, 76527, 76528, 76529, 76622, O0011, O00111, O00112, O00119, O00212, O00219, O0081, O09, O090, O0900, O0901, O0902, O0903, O091, O0910, O0911, O0912, O0913, O092, O0921, O09211, O09212, O09213, O09219, O0929, O09291, O09292, O09293, O09299, O093, O0930, O0931, O0932, O0933, O094, O0940, O0941, O0942, O0943, O09511, O09513, O09521, O09522, O09523, O09529, O09611, O09612, O09613, O09621, O09622, O09623, O09629, O097, O0970, O0971, O0972, O0973, O098, O0981, O09811, O09812, O09813, O09819, O0982, O09821, O09822, O09823, O09829, O0989, O09891, O09892, O09893, O09899, O099, O0990, O0991, O0992, O0993, O09A, O09A0, O09A1, O09A2, O09A3, O10, O100, O1001, O10011, O10012, O10013, O10019, O101, O1011, O10111, O10112, O10113, O10119, O102, O1021, O10211, O10212, O10213, O10219, O103, O1031, O10311, O10312, O10313, O10319, O104, O1041, O10411, O10412, O10413, O10419, O109, O1091, O10911, O10912, O10913, O10919, O111, O112, O113, O119, O12, O120, O1200, O1201, O1202, O1203, O1204, O1205, O121, O1210, O1211, O1212, O1213, O1214, O1215, O122, O1220, O1221, O1222, O1223, O1224, O1225, O13, O131, O132, O133, O134, O135, O139, O1400, O1402, O1403, O1410, O1412, O1413, O1422, O1423, O1490, O1492, O1493, O150, O1500, O1502, O1503, O161, O162, O163, O169, O20, O208, O209, O21, O210, O211, O212, O218, O219, O22, O220, O2200, O2201, O2202, O2203, O221, O2210, O2211, O2212, O2213, O222, O2220, O2221, O2222, O2223, O223, O2230, O2231, O2232, O2233, O224, O2240, O2241, O2242, O2243, O225, O2250, O2251, O2252, O2253, O228, O228X, O228X1, O228X2, O228X3, O228X9, O229, O2290, O2291, O2292, O2293, O23, O230, O2300, O2301, O2302, O2303, O231, O2310, O2311, O2312, O2313, O232, O2320, O2321, O2322, O2323, O233, O2330, O2331, O2332, O2333, O234, O2340, O2341, O2342, O2343, O235, O2351, O23511, O23512, O23513, O23519, O2352, O23521, O23522, O23523, O23529, O2359, O23591, O23592, O23593, O23599, O239, O2390, O2391, O2392, O2393, O24, O240, O2401, O24011, O24012, O24013, O24019, O241, O2411, O24111, O24112, O24113, O24119, O243, O2431, O24311, O24312, O24313, O24319, O244, O2441, O24410, O24414, O24415, O24419, O2442, O24420, O24424, O24425, O24429, O2481, O24811, O24812, O24813, O24819, O249, O2491, O24911, O24912, O24913, O24919, O25, O251, O2510, O2511, O2512, O2513, O26, O2600, O2610, O262, O2620, O2621, O2622, O2623, O263, O2630, O2631, O2632, O2633, O264, O2640, O2641, O2642, O2643, O2650, O2651, O2652, O2653, O266, O2661, O26611, O26612, O26613, O26619, O267, O2671, O26711, O26712, O26713, O26719, O2681, O26811, O26812, O26813, O26819, O2682, O26821, O26822, O26823, O26829, O2683, O26831, O26832, O26833, O26839, O2684, O26841, O26842, O26843, O2685, O26851, O26852, O26853, O26859, O2686, O26862, O26873, O26891, O26892, O26893, O26899, O269, O2690, O2691, O2692, O2693, O29, O290, O2901, O29011, O29012, O29013, O29019, O2902, O29021, O29022, O29023, O29029, O2909, O29091, O29092, O29093, O29099, O291, O2911, O29111, O29112, O29113, O29119, O2912, O29121, O29122, O29123, O29129, O2919, O29191, O29192, O29193, O29199, O292, O2921, O29211, O29212, O29213, O29219, O2929, O29291, O29292, O29293, O29299, O293, O293X, O293X1, O293X2, O293X3, O293X9, O294, O2940, O2941, O2942, O2943, O295, O295X, O295X1, O295X2, O295X3, O295X9, O296, O2960, O2961, O2962, O2963, O298, O298X, O298X1, O298X2, O298X3, O298X9, O299, O2990, O2991, O2992, O2993, O30, O300, O3000, O30001, O30002, O30003, O30009, O3001, O30011, O30012, O3083, O30831, O30832, O30833, O30839, O3089, O30891, O30892, O30893, O30899, O309, O3090, O3091, O3092, O3093, O31, O3100X0, O3101, O3102, O3102X0, O3103, O3103X0, O311, O3110, O3110X0, O3111, O3111X0, O3112, O3112X0, O3113, O3113X0, O312, O3120, O3120X0, O3121, O3121X0, O3122, O3122X0, O3123, O3123X0, O313, O3130, O3130X0, 64240, 64241, 64242, 64243, 64244, 64250, 64251, 64252, 64253, 64254, 64260, 64261, 64262, 64263, 64264, 64270, 64271, 64272, 64273, 64274, O11, O111, O112, O113, O114, O115, O119, O14, O140, O1400, O1402, O1403, O1404, O1405, O141, O1410, O1412, O1413, O1414, O1415, O149, O1490, O1492, O1493, O1494, O1495, O15, O150, O1500, O1502, O1503, O151, O152, O159</p>
Epidural hemorrhage	<p>4320, 80020, 80021, 80022, 80023, 80024, 80025, 80026, 80029, 80070, 80071, 80072, 80073, 80074, 80075, 80076, 80079, 80120, 80121, 80122, 80123, 80124, 80125, 80126, 80129, 80170, 80171, 80172, 80173, 80174, 80175, 80176, 80179, 80320, 80321, 80322, 80323, 80324, 80325, 80326, 80329, 80370, 80371, 80372, 80373, 80374, 80375, 80376, 80379, 80420, 80421, 80422, 80423, 80424, 80425, 80426, 80429, 80470, 80471, 80472, 80473, 80474, 80475, 80476, 80479, 85240, 85241, 85242, 85243, 85244, 85245, 85246, 85249, 85250, 85251, 85252, 85253, 85254, 85255, 85256, 85259, I621, S064, S064X, S064X0,</p>

Disease	ICD 9/10 Code
	S064X0A, S064X0D, S064X0S, S064X1, S064X1A, S064X1D, S064X1S, S064X2, S064X2A, S064X2D, S064X2S, S064X3, S064X3A, S064X3D, S064X3S, S064X4, S064X4A, S064X4D, S064X4S, S064X5, S064X5A, S064X5D, S064X5S, S064X6, S064X6A, S064X6D, S064X6S, S064X7, S064X7A, S064X7D, S064X7S, S064X8, S064X8A, S064X8D, S064X8S, S064X9, S064X9A, S064X9D, S064X9S, S064XA, S064XAA, S064XAD, S064XAS
Subdural hemorrhage	4321, 7670, 85220, 85221, 85222, 85223, 85224, 85225, 85226, 85229, 85230, 85231, 85232, 85233, 85234, 85235, 85236, 85239, I620, I6200, I6201, I6202, I6203, P100, S065, S065X, S065X0, S065X0A, S065X0D, S065X0S, S065X1, S065X1A, S065X1D, S065X1S, S065X2, S065X2A, S065X2D, S065X2S, S065X3, S065X3A, S065X3D, S065X3S, S065X4, S065X4A, S065X4D, S065X4S, S065X5, S065X5A, S065X5D, S065X5S, S065X6, S065X6A, S065X6D, S065X6S, S065X7, S065X7A, S065X7D, S065X7S, S065X8, S065X8A, S065X8D, S065X8S, S065X9, S065X9A, S065X9D, S065X9S, S065XA, S065XAA, S065XAD, S065XAS
Subarachnoid hemorrhage	430, 85200, 85201, 85202, 85203, 85204, 85205, 85206, 85209, 85210, 85211, 85212, 85213, 85214, 85215, I605, I6050, I6051, I6052, I606, I607, I608, I609, I690, I6900, I6901, I69010, I69011, I69012, I69013, I69014, I69015, I69018, I69019, I6902, I69020, I69021, I69022, I69023, I69028, I6903, I69031, I69032, I69033, I69034, I69039, I6904, I69041, I69042, I69043, I69044, I69049, I6905, I69051, I69052, I69053, I69054, I69059, I6906, I69061, I69062, I69063, I69064, I69065, I69069, I6909, I69090, I69091, I69092, I69093, I69098, P103, P525, S066, S066X, S066X0, S066X0A, S066X0D, S066X0S, S066X1, S066X1A, S066X1D, S066X1S, S066X2, S066X2A, S066X2D, S066X2S, S066X3, S066X3A, S066X3D, S066X3S, S066X4, S066X4A, S066X4D, S066X4S, S066X5, S066X5A, S066X5D, S066X5S, S066X6, S066X6A, S066X6D, S066X6S, S066X7, S066X7A, S066X7D, S066X7S, S066X8, S066X8A, S066X8D, S066X8S, S066X9, S066X9A, S066X9D, S066X9S, S066XAA, S066XAD, S066XAS
Intracerebral hemorrhage	431, 7670, I691, I6911, I69110, I69111, I69112, I69113, I69114, I69115, I69118, I69119, I6912, I69120, I69121, I69122, I69123, I69128, I6913, I69131, I69132, I69133, I69134, I69139, I6914, I69141, I69142, I69143, I69144, I69149, I6915, I69151, I69152, I69153, I69159, I6916, I6919, I69190, I69191, I69192, I69193, I69198, P101
Ischemic stroke	34660, 34661, 34662, 34663, 43301, 43311, 43321, 43331, 43381, 43391, 43401, 43411, G436, I63, I630, I6300, I6301, I63011, I63012, I63013, I63019, I6302, I6303, I63031, I63032, I63033, I63039, I6309, I631, I6310, I6311, I63111, I63112, I63113, I63119, I6312, I6313, I63131, I63132, I63133, I63139, I6319, I632, I6320, I6321, I63211, I63212, I63213, I63219, I6322, I6323, I63231, I63232, I63233, I63239, I6329, I633, I6330, I6331, I63311, I63312, I63313, I63319, I6332, I63321, I63322, I63323, I63329, I6333, I63331, I63332, I63333, I63339, I6334, I63341, I63342, I63343, I63349, I6339, I634, I6340, I6341, I63411, I63412, I63413, I63419, I6342, I63421, I63422, I63423, I63429, I6343, I63431, I63432, I63433, I63439, I6344, I63441, I63442, I63443, I63449, I6349, I635, I6350, I6351, I63511, I63512, I63513, I63519, I6352, I63521, I63522, I63523, I63529, I6353, I63531, I63532, I63533, I63539, I6354, I63541, I63542, I63543, I63549, I6359, I636, I6381, I6389, I69312, I69313, I69320, I69323, I6933, I69331, I6934, I6935, I69391, P9182, P91821, P91822, P91823, P91829
Aortic dissection	44100, 44101, 44102, 44103, I71, I710, I7101, I71010, I71011, I71012, I71019, I7102, I7103
Pheochromocytoma	/

Abbreviations:

ICD-9, International Classification of Diseases, Ninth Revision; ICD-10, International Classification of Diseases, Tenth Revision; HHD, Hypertensive Heart Disease; HKD, Hypertensive Kidney Disease.

Table S2. Detailed baseline characteristics and comorbidities by 30-day survival condition in critically ill patients with severe acute hypertension.

Variable	Overall (n = 4 895)	Survivors (n = 4 146)	Non-survivors (n = 749)	P
Demographics				
Male gender, n (%)	2 704 (55.24)	2 319 (55.93)	385 (51.40)	0.02
Age (year)	68.08 (56.90 - 79.01)	67.15 (56.43 - 78.01)	73.39 (61.73 - 83)	<0.001
White, n (%)	2 976 (60.80)	2 544 (61.36)	432 (57.68)	0.06
Medical History				
Myocardial infarction, n (%)	715 (14.61)	574 (13.84)	141 (18.83)	<0.001
Congestive heart failure, n (%)	1 184 (24.19)	967 (23.32)	217 (28.97)	0.001
Peripheral vascular disease, n (%)	575 (11.75)	486 (11.72)	89 (11.88)	0.90
Cerebrovascular disease, n (%)	758 (15.49)	600 (14.47)	158 (21.09)	<0.001
COPD, n (%)	1 255 (25.64)	1 040 (25.08)	215 (28.70)	0.04
Rheumatic disease, n (%)	189 (3.86)	153 (3.69)	36 (4.81)	0.15
Diabetes, n (%)	1 743 (35.61)	1 515 (36.54)	228 (30.44)	0.001
Renal disease, n (%)	1 209 (24.70)	1 025 (24.72)	184 (24.57)	0.96
Severe liver disease, n (%)	224 (4.58)	174 (4.20)	50 (6.68)	0.004
Malignant cancer, n (%)	658 (13.44)	517 (12.47)	141 (18.83)	<0.001
Pre-existing hypertension, n (%)	3 854 (78.73)	3 312 (79.88)	542 (72.36)	<0.001
Hypertensive TOD, n (%)	1 450 (29.62)	1 237 (29.84)	213 (28.44)	0.46
In-hospital Complications				
AKI, n (%)	3 939 (80.47)	3 263 (78.70)	676 (90.25)	<0.001
Stage 1 AKI, n (%)	775 (15.83)	693 (16.71)	82 (10.95)	<0.001
Stage 2 AKI, n (%)	1 842 (37.63)	1 593 (38.42)	249 (33.24)	0.01
Stage 3 AKI, n (%)	1 322 (27.01)	977 (23.56)	345 (46.06)	<0.001
Sepsis, n (%)	2 960 (60.47)	2 358 (56.87)	602 (80.37)	<0.001
Severe coma (GCS ≤ 8)	457 (9.34)	326 (7.86)	131 (17.49)	<0.001
Delirium, n (%)	1 877 (38.35)	1 550 (37.39)	327 (43.66)	0.001
BP Parameters				
SBP-baseline (mmHg)	139 (118 - 160)	141 (119 - 161)	131(110 - 154)	<0.001
DBP-baseline (mmHg)	71 (59 - 86)	72 (60 - 87)	69 (57 - 82)	<0.001
Timing of severe acute hypertension	50.66	40.27	80.93	<0.001
onset (hour)	(6.22 - 100.05)	(5.08 - 96.56)	(21.00 - 122.48)	<0.001
SBP-index (mmHg)	186 (182 - 193)	186 (182 - 192)	187 (182 - 194)	0.004
DBP-index (mmHg)	87 (75 - 101)	87 (75 - 101)	86 (71 - 100)	0.002
SBP-1h (mmHg)	154 (133 - 172)	155 (135 - 172)	147(121 - 170)	<0.001
DBP-1h (mmHg)	72 (60 - 86)	73 (61 - 87)	67 (55 - 81)	<0.001
SBP-PR (%)	17.58 (7.81 - 30.32)	17.11 (7.74 - 28.94)	22.22 (9.09 - 37.22)	<0.001
DBP-PR (%)	14.10 (1.26 - 29.41)	13.70 (1.15 - 28.20)	17.72 (2.22 - 35.29)	<0.001
In-hospital mean SBP (mmHg)	135.75 (124.48 - 146.15)	136.90 (125.72 - 146.93)	129.22 (117.21 - 140.91)	<0.001
In-hospital mean DBP (mmHg)	67.01 (59.59 - 75.29)	67.84 (60.44 - 76.04)	62.29 (55.75 - 69.90)	<0.001

Variable	Overall (n = 4 895)	Survivors (n = 4 146)	Non-survivors (n = 749)	P
In-hospital max SBP (mmHg)	193 (185 - 205)	192 (185 - 204)	196 (187 - 210)	<0.001
In-hospital max DBP (mmHg)	117 (101 - 137)	117 (101 - 137)	114 (99 - 138)	0.10
Vital Signs				
Heart rate (bpm)	87 (73 - 102)	86 (73 - 102)	89 (74 - 104)	0.03
Temperature (°C)	36.78 (36.44 - 37.17)	36.78 (36.44 - 37.17)	36.67 (36.33 - 37.06)	<0.001
Respiratory rate (bpm)	19 (16 - 23.75)	19 (15 - 23)	20 (17 - 25)	<0.001
Laboratory Findings				
INR	1.20 (1.10 - 1.40)	1.20 (1.10 - 1.40)	1.30 (1.10 - 1.60)	<0.001
PT (s)	13.40 (12.20 - 15.50)	13.30 (12.10 - 15.30)	14.10 (12.50 - 17.30)	<0.001
PTT (s)	30.00 (26.70 - 35.50)	29.80 (26.60 - 35.00)	31.10 (27.30 - 39.80)	<0.001
Sodium (mmol/L)	139 (136 - 142)	139 (136 - 141)	139 (136 - 142)	0.09
Potassium (mmol/L)	4.10 (3.70 - 4.60)	4.10 (3.70 - 4.60)	4.10 (3.70 - 4.70)	0.23
Chloride (mmol/L)	104 (100 - 108)	104 (100 - 108)	104 (99 - 108)	0.45
Calcium (mg/dl)	8.40 (7.90 - 8.90)	8.40 (7.90 - 8.90)	8.30 (7.60 - 8.80)	0.005
Glucose (mg/dl)	139 (111 - 181)	137 (110 - 178)	148 (117 - 205)	<0.001
SCr (µmol/L)	1 (0.80 - 1.60)	1 (0.80 - 1.60)	1.20 (0.80 - 1.90)	<0.001
BUN (mg/dL)	20 (14 - 33)	20 (13 - 31)	25 (17 - 41)	<0.001
Hb (g/L)	120.74 (102.13 - 139.32)	121.49 (103.36 - 139.84)	116.32 (95.79 - 135.78)	<0.001
RBC (*10 ¹² /L)	3.67 (3.13 - 4.21)	3.69 (3.15 - 4.23)	3.55 (3.02 - 4.13)	<0.001
WBC (*10 ⁹ /L)	10.90 (7.70 - 15.10)	10.70 (7.60 - 14.80)	12.30 (8.40 - 17.20)	<0.001
Platelet (*10 ⁹ /L)	201 (146 - 266)	201 (148 - 264.75)	197 (137 - 270)	0.13
Treatment				
Ventilator use, n (%)	4 080 (83.35)	3 426 (82.63)	654 (87.32)	0.001
CRRT, n (%)	367 (7.50)	252 (6.08)	115 (15.35)	<0.001
Antihypertensive medications, n (%)	4 569 (93.34)	3 895 (93.95)	674 (89.99)	<0.001
RAASi, n (%)	1 935 (39.53)	1 781 (42.96)	154 (20.56)	<0.001
Beta-blockers, n (%)	3 567 (72.87)	3 093 (74.60)	474 (63.28)	<0.001
CCB, n (%)	1 959 (40.02)	1 729 (41.70)	230 (30.71)	<0.001
Diuretics, n (%)	3 012 (61.53)	2 528 (60.97)	484 (64.62)	0.06
Intravenous antihypertensive agents, n (%)	3 203 (65.43)	2 809 (67.75)	394 (52.60)	<0.001
SNP, n (%)	72 (1.47)	62 (1.50)	10 (1.34)	0.87
Phentolamine, n (%)	6 (0.12)	5 (0.12)	1 (0.13)	1.00
Esmolol, n (%)	133 (2.72)	112 (2.70)	21 (2.80)	0.90
Clonidine, n (%)	453 (9.25)	418 (10.08)	35 (4.67)	<0.001
Enalaprilat, n (%)	63 (1.29)	56 (1.35)	7 (0.93)	0.48
Nicardipine, n (%)	527 (10.77)	447 (10.78)	80 (10.68)	1.00
Hydralazine, n (%)	2 188 (44.70)	1 928 (46.50)	260 (34.71)	<0.001
Labetalol, n (%)	1 437 (29.36)	1 244 (30)	193 (25.77)	0.02
Nitroglycerin, n (%)	844 (17.24)	768 (18.52)	76 (10.15)	<0.001

Variable	Overall (n = 4 895)	Survivors (n = 4 146)	Non-survivors (n = 749)	P
Vasoactive agents, n (%)	1 699 (34.71)	1 294 (31.21)	405 (54.07)	<0.001
Dobutamine, n (%)	51 (1.04)	30 (0.72)	21 (2.80)	<0.001
Dopamine, n (%)	169 (3.45)	119 (2.87)	50 (6.68)	<0.001
Milrinone, n (%)	57 (1.16)	47 (1.13)	10 (1.34)	0.58
Epinephrine, n (%)	169 (3.45)	112 (2.70)	57 (7.61)	<0.001
Norepinephrine, n (%)	1 132 (23.13)	796 (19.20)	336 (44.86)	<0.001
Hospital Stay (day)	10.02 (5.74 - 18.05)	10.33 (5.87 - 18.85)	8.86 (4.71 - 14.65)	<0.001

Abbreviations: SBP, Systolic Blood Pressure; SBP-index, Index Systolic Blood Pressure; SBP-1h, Achieved Systolic Blood Pressure at 1 hour; SBP-PR, Systolic Blood Pressure Percentage Reduction; DBP, Diastolic Blood Pressure; DBP-index, Index Diastolic Blood Pressure; DBP-1h, Achieved Diastolic Blood Pressure at 1 hour; DBP-PR, Diastolic Blood Pressure Percentage Reduction; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage; HHD, Hypertensive Heart Disease; HKD, Hypertensive Kidney Disease; AKI, Acute Kidney Injury; CRRT, Continuous Renal Replacement Therapy; RAASi, Renin - Angiotensin - Aldosterone System Inhibitors; CCB, Calcium Channel Blockers; SNP, Sodium Nitroprusside; GCS, Glasgow Coma Scale; SCr, Serum Creatinine; WBC, White Blood Cell Count; Hb, Hemoglobin.

Table S3. Receiver operating characteristic (ROC) analysis for diastolic blood pressure thresholds.

Rank	DBP-1h (mmHg)	sensitivity	specificity	DBP-PR (%)	sensitivity	specificity
1	70.25	0.59	0.56	26.62	0.62	0.27
2	70.75	0.59	0.56	29.28	0.66	0.24
3	66.25	0.50	0.64	26.21	0.61	0.28
4	66.75	0.50	0.64	26.38	0.62	0.28
5	72.75	0.62	0.52	26.29	0.62	0.28
AUC (95% CI)		0.59 (0.57 - 0.61)		0.45 (0.43 - 0.47)		

Top five values for achieved diastolic blood pressure (DBP-1h) and its percentage reduction (DBP-PR) that maximize the sum of sensitivity and specificity (Youden Index) for predicting 30-day mortality. The reported decimal thresholds represent the midpoints between adjacent observed integer values, identified by the ROC algorithm as optimal discriminators. Corresponding sensitivity and specificity values are detailed for each threshold.

Abbreviations: ROC, Receiver Operating Characteristic; DBP-1h, Achieved Diastolic Blood Pressure at 1 hour; DBP-PR, Diastolic Blood Pressure Percentage Reduction; AUC, Area Under the Curve.

Table S4. Identification of optimal blood pressure control targets for secondary clinical outcomes from Restricted Cubic Spline Analysis.

Outcome	BP Parameters	Nadir Value
Coma	SBP-1h	164.67 mmHg
	DBP-1h	/
	SBP-PR	12.45%
	DBP-PR	/
Stage 3 AKI	SBP-1h	145.36 mmHg
	DBP-1h	69.30 mmHg
	SBP-PR	15.74%
	DBP-PR	/

Abbreviations: RCS, Restricted Cubic Splines; SBP-1h, Achieved Systolic Blood Pressure at 1 hour; DBP-1h, Achieved Diastolic Blood Pressure at 1 hour; SBP-PR, Systolic Blood Pressure Percentage Reduction; DBP-PR, Diastolic Blood Pressure Percentage Reduction; AKI, Acute Kidney Injury.

Table S5. Multivariate Cox proportional hazards analysis of adjusted covariates and 30-day mortality.

Covariates	n	n of events	HR (95% CI)	P
SBP-1h < 140 mmHg	1 572	318	1.41 (1.19, 1.65)	<0.001
140 mmHg ≤ SBP-1h < 180 mmHg	2 610	317	1	ref.
SBP-1h ≥ 180 mmHg	710	114	1.56 (1.25, 1.93)	<0.001
Female	2 191	364	1.09 (0.94, 1.27)	0.23
Age	4 895	749	1.02 (1.02, 1.03)	<0.001
White	2 976	432	0.76 (0.65, 0.88)	<0.001
Pre-existing hypertension	3 854	542	0.67 (0.56, 0.81)	<0.001
IV Antihypertensive Therapy	3 203	394	0.57 (0.49, 0.66)	<0.001
TOD	1 450	213	0.92 (0.70, 1.21)	0.55
SBP-index	4 895	749	1.01 (1.00, 1.01)	0.01
CKD	1 209	184	1.13 (0.87, 1.47)	0.35
Myocardial Infarction	715	141	1.34 (1.11, 1.63)	0.003
Diabetes	1 743	228	0.77 (0.66, 0.91)	0.002
Cerebrovascular Disease	758	158	2.03 (1.69, 2.44)	<0.001
Heart Failure	1 184	217	1.08 (0.90, 1.29)	0.40
Peripheral Vascular Disease	575	89	0.91 (0.73, 1.15)	0.44
COPD	1 255	215	1.06 (0.90, 1.25)	0.47
Rheumatic Disease	189	36	1.09 (0.78, 1.53)	0.60
Severe Liver Disease	224	50	1.55 (1.14, 2.09)	0.004
Malignant Tumor	658	141	1.57 (1.30, 1.89)	<0.001
Sepsis	2 960	602	2.28 (1.87, 2.78)	<0.001
Onset Timing > 24h	2 874	543	1.35 (1.13, 1.63)	0.001
Vasoactive Agents	1 699	405	1.72 (1.46, 2.02)	<0.001
Delirium	1 877	327	0.85 (0.73, 1.00)	0.05

Abbreviations: SBP-index, Index Systolic Blood Pressure; SBP-1h, Achieved Systolic

Blood Pressure at 1 hour; HR, Hazard Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage; IV, intravenous.

Table S6. Multivariate Cox proportional hazards analysis of DBP-1h and 30-day mortality.

Model	DBP-1h	n	n of events	HR (95%CI)	P
Model 0	≥ 110 mmHg	229	33	1	ref.
	100 mmHg - 110 mmHg	243	23	0.64 (0.38, 1.09)	0.10
	90 mmHg - 100 mmHg	487	55	0.77 (0.50, 1.19)	0.24
	80 mmHg - 90 mmHg	825	104	0.87 (0.59, 1.28)	0.48
	70 mmHg - 80 mmHg	949	115	0.83 (0.56, 1.22)	0.34
	60 mmHg - 70 mmHg	999	156	1.09 (0.75, 1.58)	0.66
	50 mmHg - 60 mmHg	731	147	1.44 (0.99, 2.10)	0.06
	< 50 mmHg	432	116	2.01 (1.36, 2.95)	<0.001
Model 1	≥ 110 mmHg	229	33	1	ref.
	100 mmHg - 110 mmHg	243	23	0.65 (0.38, 1.10)	0.11
	90 mmHg - 100 mmHg	487	55	0.76 (0.49, 1.17)	0.21
	80 mmHg - 90 mmHg	825	104	0.82 (0.56, 1.22)	0.33
	70 mmHg - 80 mmHg	949	115	0.76 (0.52, 1.13)	0.18
	60 mmHg - 70 mmHg	999	156	0.98 (0.67, 1.42)	0.90
	50 mmHg - 60 mmHg	731	147	1.27 (0.87, 1.86)	0.21
	< 50 mmHg	432	116	1.68 (1.13, 2.49)	0.01
Model 2	≥ 110 mmHg	229	33	1	ref.
	100 mmHg - 110 mmHg	243	23	0.72 (0.42, 1.22)	0.22
	90 mmHg - 100 mmHg	487	55	0.70 (0.46, 1.08)	0.11
	80 mmHg - 90 mmHg	825	104	0.77 (0.52, 1.15)	0.20
	70 mmHg - 80 mmHg	949	115	0.64 (0.44, 0.95)	0.03
	60 mmHg - 70 mmHg	999	156	0.75 (0.51, 1.10)	0.14
	50 mmHg - 60 mmHg	731	147	0.89 (0.61, 1.31)	0.56
	< 50 mmHg	432	116	1.18 (0.79, 1.75)	0.42

Relationship between diastolic blood pressure percentage reduction and 30-day mortality, with DBP-1h categorized into eight subgroups based on thresholds of 50mmHg, 60mmHg, 70mmHg, 80mmHg, 90mmHg, 100mmHg, and 110mmHg. The group with DBP-1h ≥ 110mmHg serves as the reference. In model 1, covariates included age, sex and race. In model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

Abbreviations:

DBP-1h, Achieved Diastolic Blood Pressure at 1 hour; SBP-index, systolic blood pressure at the onset of the hypertensive crises; HR, Hazard Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S7. Multivariate Cox proportional hazards analysis of DBP-PR and 30-day mortality.

Model	DBP-PR	<i>n</i>	<i>n</i> of events	HR (95%CI)	<i>P</i>
Model 0	≤ 0%	1 171	167	1	ref.
	0% - 5%	416	60	1.02 (0.76, 1.37)	0.90
	5% - 10%	483	55	0.79 (0.58, 1.06)	0.12
	10% - 15%	461	60	0.91 (0.68, 1.22)	0.53
	15% - 20%	451	55	0.86 (0.63, 1.16)	0.32
	20% - 25%	376	56	1.06 (0.78, 1.43)	0.72
	25% - 30%	338	49	1.02 (0.74, 1.40)	0.90
	> 30%	1 199	247	1.51 (1.24, 1.84)	<0.001
Model 1	≤ 0%	1 171	167	1	ref.
	0% - 5%	416	60	1.06 (0.79, 1.43)	0.68
	5% - 10%	483	55	0.80 (0.59, 1.08)	0.14
	10% - 15%	461	60	0.96 (0.71, 1.28)	0.76
	15% - 20%	451	55	0.90 (0.67, 1.23)	0.52
	20% - 25%	376	56	1.07 (0.79, 1.45)	0.65
	25% - 30%	338	49	1.07 (0.78, 1.47)	0.69
	> 30%	1 199	247	1.55 (1.27, 1.88)	<0.001
Model 2	≤ 0%	1 171	167	1	ref.
	0% - 5%	416	60	1.14 (0.85, 1.53)	0.39
	5% - 10%	483	55	0.85 (0.62, 1.15)	0.28
	10% - 15%	461	60	0.91 (0.68, 1.23)	0.55
	15% - 20%	451	55	0.89 (0.66, 1.21)	0.47
	20% - 25%	376	56	0.93 (0.68, 1.26)	0.63
	25% - 30%	338	49	1.00 (0.73, 1.38)	0.99
	> 30%	1 199	247	1.17 (0.95, 1.43)	0.14

Relationship between DBP-PR and 30-day mortality, with DBP-PR categorized into eight subgroups based on thresholds of 0, 5%, 10%, 15%, 20%, 25%, and 30%. The group with DBP-PR ≤ 0% serves as the reference. In model 1, covariates included age, sex and race. In model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

Abbreviations:

DBP-PR, Systolic Blood Pressure Percentage Reduction; SBP-index, systolic blood pressure at the onset of the hypertensive crises; HR, Hazard Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S8. Multivariate Cox proportional hazards analysis of trichotomous SBP-1h stratification.

SBP-1h	Model	HR (95%CI)	P
< 140 mmHg	Model 0	1.77 (1.51, 2.06)	<0.001
140mmHg - 180 mmHg		1	ref.
≥ 180 mmHg		1.36 (1.09, 1.68)	0.01
< 140 mmHg	Model 1	1.80 (1.54, 2.10)	<0.001
140mmHg - 180 mmHg		1	ref.
≥ 180 mmHg		1.36 (1.10, 1.68)	0.005
< 140 mmHg	Model 2	1.41 (1.19, 1.65)	<0.001
140mmHg - 180 mmHg		1	ref.
≥ 180 mmHg		1.56 (1.25, 1.93)	<0.001

Relationship between SBP-1h and 30-day mortality, with SBP-1h categorized into eight subgroups based on thresholds of 140 mmHg and 180 mmHg. The group with a SBP-1h between 140 mmHg and 180 mmHg serves as the reference. In model 1, covariates included age, sex and race. In model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

Abbreviations: BP, Blood Pressure; SBP, Systolic Blood Pressure; DBP, Diastolic Blood Pressure; SBP-index, Index Systolic Blood Pressure; SBP-1h, Achieved Systolic Blood Pressure at 1 hour; HR, Hazard Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S9. Multivariate Cox proportional hazards analysis of trichotomous SBP-PR stratification.

SBP-PR	Model	HR (95%CI)	P
≤ 5%	Model 0	1.32 (1.07, 1.62)	0.01
5% - 25%		1	ref.
> 25%		1.81 (1.55, 2.12)	<0.001
≤ 5%	Model 1	1.33 (1.08, 1.64)	0.01
5% - 25%		1	ref.
> 25%		1.85 (1.58, 2.17)	<0.001
≤ 5%	Model 2	1.51 (1.23, 1.87)	<0.001
5% - 25%		1	ref.
> 25%		1.44 (1.21, 1.70)	<0.001

Relationship between SBP-PR and 30-day mortality, with SBP-PR categorized into three subgroups based on thresholds of 5% and 25%. The group with a SBP-PR between 5% and 25% serves as the reference. In model 1, covariates included age, sex and race. In model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

Abbreviations: BP, Blood Pressure; SBP-index, Index Systolic Blood Pressure; SBP-PR, Systolic Blood Pressure Percentage Reduction; HR, Hazard Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S10. Multivariate Cox proportional hazards analysis of binary DBP-1h stratification.

DBP-1h	Model	HR (95%CI)	P
< 70 mmHg	Model 0	1.67 (1.45, 1.93)	<0.001
≥ 70 mmHg		1	ref.
< 70 mmHg	Model 1	1.53 (1.32, 1.77)	<0.001
≥ 70 mmHg		1	ref.
< 70 mmHg	Model 2	1.22 (1.05, 1.42)	0.01
≥ 70 mmHg		1	ref.

Relationship between DBP-1h and 30-day mortality, with DBP-1h categorized into two subgroups based on a threshold of 70 mmHg. The group with DBP-1h \geq 70 mmHg serves as the reference. In model 1, covariates included age, sex and race. In model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

Abbreviations: BP, Blood Pressure; DBP-1h, Achieved Diastolic Blood Pressure at 1 hour; SBP-index, Index Systolic Blood Pressure; HR, Hazard Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S11. Multivariate Cox proportional hazards analysis of binary DBP-PR stratification.

DBP-1h	Model	HR (95%CI)	P
≤ 27%	Model 0	1	ref.
> 27%		1.55 (1.33, 1.80)	<0.001
≤ 27%	Model 1	1	ref.
> 27%		1.54 (1.33, 1.79)	<0.001
≤ 27%	Model 2	1	ref.
> 27%		1.20 (1.03, 1.41)	0.02

Relationship between DBP-PR and 30-day mortality, with DBP-PR categorized into two subgroups based on a threshold of 27%. The group with DBP-PR ≤ 27% serves as the reference. In model 1, covariates included age, sex and race. In model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

Abbreviations: BP, Blood Pressure; DBP-PR, Diastolic Blood Pressure Percentage Reduction; SBP-index, Index Systolic Blood Pressure; HR, Hazard Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S12. Multivariate logistic regression analysis of trichotomous SBP-1h stratification for the incidence of Stage 3 AKI.

SBP-1h	Model	OR (95%CI)	P
< 140 mmHg	Model 0	1.38 (1.20, 1.58)	<0.001
140mmHg - 180 mmHg		1	Ref.
≥ 180 mmHg		1.13 (0.93, 1.36)	0.21
< 140 mmHg	Model 1	1.39 (1.21, 1.60)	<0.001
140mmHg - 180 mmHg		1	Ref.
≥ 180 mmHg		1.12 (0.93, 1.35)	0.24
< 140 mmHg	Model 2	1.19 (1.02, 1.40)	0.03
140mmHg - 180 mmHg		1	Ref.
≥ 180 mmHg		1.22 (0.99, 1.50)	0.06

Relationship between SBP-1h and the incidence of Stage 3 AKI, with SBP-1h categorized into three subgroups based on thresholds of 140 mmHg and 180 mmHg. The group with SBP-1h between 140 mmHg and 180 mmHg serves as the reference. In Model 1, covariates included age, sex, and race. In Model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

Abbreviations: BP, Blood Pressure; SBP-index, Index Systolic Blood Pressure; SBP-1h, Achieved Systolic Blood Pressure at 1 hour; AKI, acute kidney injury; OR, Odds Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S13. Multivariate logistic regression analysis of trichotomous SBP-PR stratification for the incidence of Stage 3 AKI.

SBP-PR	Model	OR (95%CI)	P
≤ 5%	Model 0	1.22 (1.02, 1.45)	0.03
5% - 25%		1	Ref.
> 25%		1.43 (1.25, 1.65)	<0.001
≤ 5%	Model 1	1.21 (1.01, 1.44)	0.04
5% - 25%		1	Ref.
> 25%		1.43 (1.24, 1.65)	<0.001
≤ 5%	Model 2	1.29 (1.06, 1.56)	0.01
5% - 25%		1	Ref.
> 25%		1.23 (1.04, 1.45)	0.01

Relationship between SBP-PR and the incidence of Stage 3 AKI, with SBP-PR categorized into three subgroups based on thresholds of 5% and 25%. The group with SBP-PR between 5% and 25% serves as the reference. In Model 1, covariates included age, sex, and race. In Model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

Abbreviations: BP, Blood Pressure; SBP-index, Index Systolic Blood Pressure; SBP-PR, Systolic Blood Pressure Percentage Reduction; AKI, acute kidney injury; OR, Odds Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S14. Multivariate logistic regression analysis of binary DBP-1h stratification for the incidence of Stage 3 AKI.

Relationship between DBP-1h and the incidence of Stage 3 AKI, with DBP-1h categorized into two subgroups based on a threshold of 70 mmHg. The group with DBP-1h \geq 70 mmHg serves as the reference. In Model 1, covariates included age, sex, and race. In Model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

DBP-1h	Model	OR (95%CI)	P
< 70 mmHg	Model 0	1.38 (1.22, 1.57)	<0.001
\geq 70 mmHg		1	Ref.
< 70 mmHg	Model 1	1.46 (1.28, 1.67)	<0.001
\geq 70 mmHg		1	Ref.
< 70 mmHg	Model 2	1.11 (0.96, 1.29)	0.15
\geq 70 mmHg		1	ref.

Abbreviations: BP, Blood Pressure; SBP-index, Index Systolic Blood Pressure; DBP-1h, Achieved Diastolic Blood Pressure at 1 hour; AKI, acute kidney injury; OR, Odds Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S15. Multivariate logistic regression analysis of binary DBP-PR stratification for the incidence of Stage 3 AKI.

DBP-1h	Model	OR (95%CI)	P
≤ 27%	Model 0	1	Ref.
> 27%		1.16 (1.01, 1.33)	0.04
≤ 27%	Model 1	1	Ref.
> 27%		1.16 (1.01, 1.34)	0.03
≤ 27%	Model 2	1	Ref.
> 27%		1.03 (0.88, 1.21)	0.70

Relationship between DBP-PR and the incidence of Stage 3 AKI, with DBP-PR categorized into two subgroups based on a threshold of 27%. The group with DBP-PR ≤ 27% serves as the reference. In Model 1, covariates included age, sex, and race. In Model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

Abbreviations: BP, Blood Pressure; SBP-index, Index Systolic Blood Pressure; DBP-1h, Achieved Diastolic Blood Pressure at 1 hour; AKI, acute kidney injury; OR, Odds Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S16. Multivariate logistic regression analysis of trichotomous SBP-1h stratification for the incidence of coma.

SBP-1h	Model	OR (95%CI)	P
< 140 mmHg	Model 0	1.33 (1.07, 1.64)	0.01
140mmHg - 180 mmHg		1	Ref.
≥ 180 mmHg		1.11 (0.83, 1.48)	0.46
< 140 mmHg	Model 1	1.33 (1.08, 1.64)	0.01
140mmHg - 180 mmHg		1	Ref.
≥ 180 mmHg		1.11 (0.83, 1.48)	0.47
< 140 mmHg	Model 2	1.25 (1.00, 1.56)	0.05
140mmHg - 180 mmHg		1	Ref.
≥ 180 mmHg		1.18 (0.88, 1.58)	0.26

Relationship between SBP-1h and the incidence of coma, with SBP-1h categorized into three subgroups based on thresholds of 140 mmHg and 180 mmHg. The group with SBP-1h between 140 mmHg and 180 mmHg serves as the reference. In Model 1, covariates included age, sex, and race. In Model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

Abbreviations: BP, Blood Pressure; SBP-1h, Achieved Systolic Blood Pressure at 1 hour; SBP-index, Index Systolic Blood Pressure; OR, Odds Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S17. Multivariate logistic regression analysis of trichotomous SBP-PR stratification for the incidence of coma.

SBP-PR	Model	OR (95%CI)	P
≤ 5%	Model 0	1.26 (0.96, 1.64)	0.09
5% - 25%		1	Ref.
> 25%		1.25 (1.00, 1.54)	0.04
≤ 5%	Model 1	1.26 (0.96, 1.64)	0.09
5% - 25%		1	Ref.
> 25%		1.25 (1.01, 1.55)	0.04
≤ 5%	Model 2	1.30 (0.99, 1.70)	0.06
5% - 25%		1	Ref.
> 25%		1.15 (0.91, 1.45)	0.24

Relationship between SBP-PR and the incidence of coma, with SBP-PR categorized into three subgroups based on thresholds of 5% and 25%. The group with SBP-PR between 5% and 25% serves as the reference. In Model 1, covariates included age, sex, and race. In Model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

Abbreviations: BP, Blood Pressure; SBP-index, Index Systolic Blood Pressure; SBP-PR, Systolic Blood Pressure Percentage Reduction; OR, Odds Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S18. Multivariate logistic regression analysis of binary DBP-1h stratification for the incidence of coma.

DBP-1h	Model	OR (95%CI)	P
< 70 mmHg	Model 0	0.97 (0.80, 1.18)	0.78
≥ 70 mmHg		1	Ref.
< 70 mmHg	Model 1	0.97 (0.80, 1.18)	0.77
≥ 70 mmHg		1	Ref.
< 70 mmHg	Model 2	0.82 (0.67, 1.01)	0.06
≥ 70 mmHg		1	Ref.

Relationship between DBP-1h and the incidence of coma, with DBP-1h categorized into two subgroups based on a threshold of 70 mmHg. The group with DBP-1h ≥ 70 mmHg serves as the reference. In Model 1, covariates included age, sex, and race. In Model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

Abbreviations: BP, Blood Pressure; SBP-index, Index Systolic Blood Pressure; DBP-1h, Achieved Diastolic Blood Pressure at 1 hour; OR, Odds Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Table S19. Multivariate logistic regression analysis of binary DBP-PR stratification for the incidence of coma.

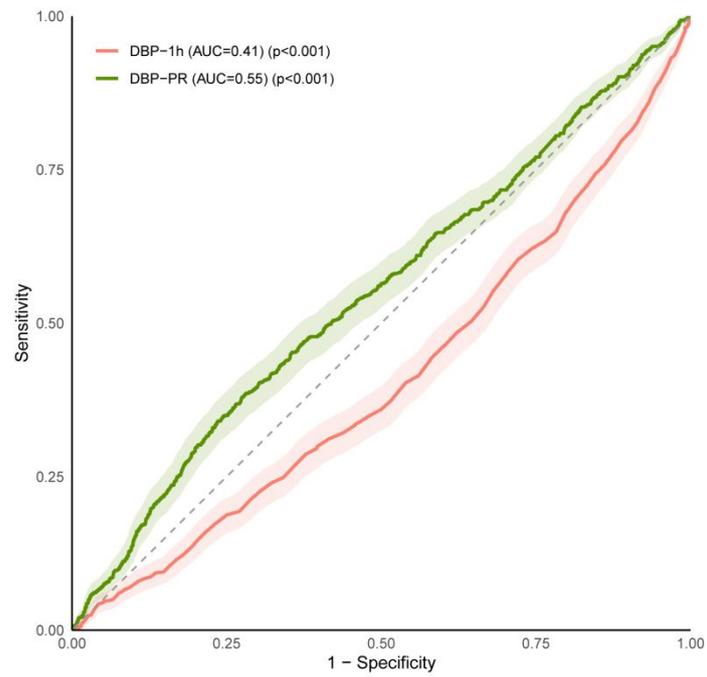
Relationship between DBP-PR and the incidence of coma, with DBP-PR categorized into two

DBP-1h	Model	OR (95%CI)	P
≤ 27%	Model 0	1	Ref.
> 27%		0.93 (0.75, 1.15)	0.51
≤ 27%	Model 1	1	Ref.
> 27%		0.93 (0.75, 1.15)	0.51
≤ 27%	Model 2	1	Ref.
> 27%		0.85 (0.68, 1.07)	0.18

subgroups based on a threshold of 27%. The group with DBP-PR ≤ 27% serves as the reference. In Model 1, covariates included age, sex, and race. In Model 2, covariates included age, sex, race, comorbidities (myocardial infarction, heart failure, diabetes, renal disease, cerebrovascular disease, malignant tumor, peripheral vascular disease, COPD, severe liver disease, rheumatic disease, pre-existing hypertension, and prior TOD due to hypertension), sepsis, delirium, SBP-index, the use of vasoactive agents, intravenous antihypertensive therapy, and the timing of severe acute hypertension onset.

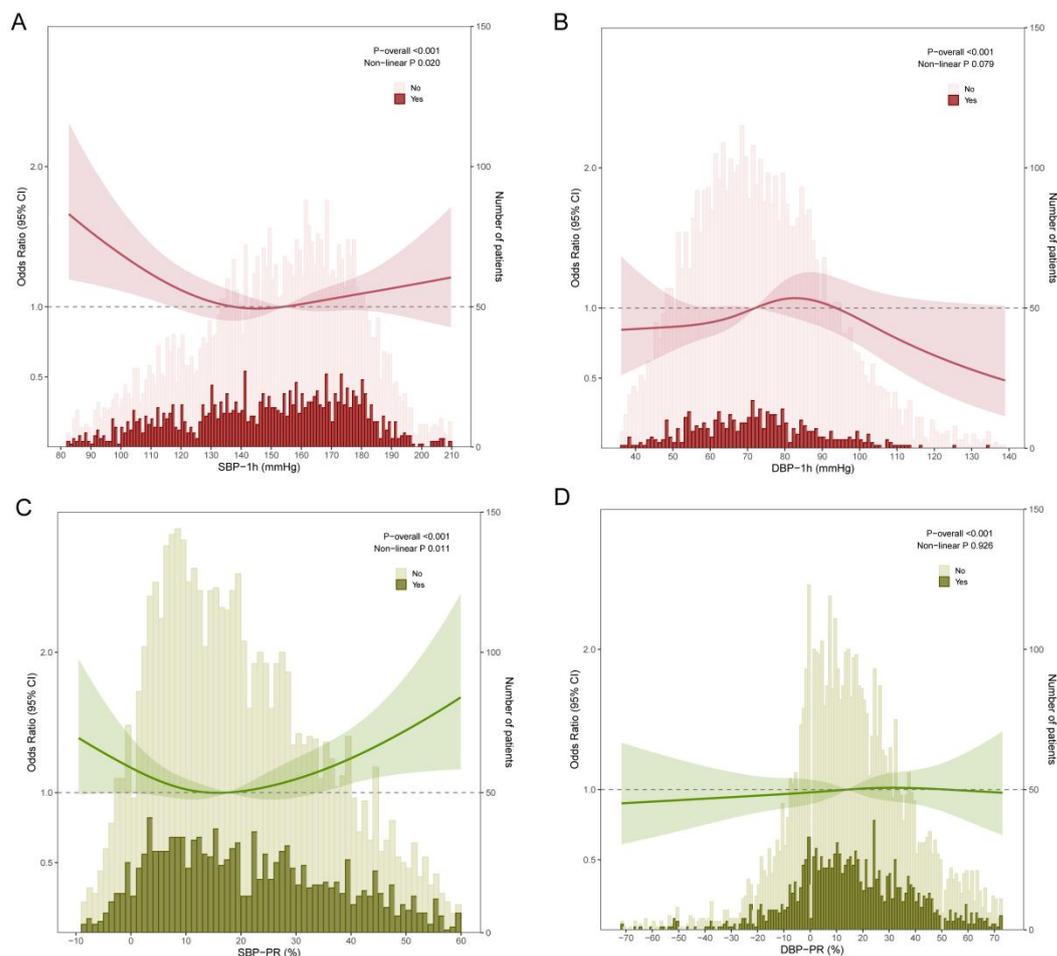
Abbreviations: BP, Blood Pressure; SBP, Systolic Blood Pressure; DBP, Diastolic Blood Pressure; SBP-index, Index Systolic Blood Pressure; DBP-PR, Diastolic Blood Pressure Percentage Reduction; OR, Odds Ratio; CI, Confidence Interval; COPD, Chronic Obstructive Pulmonary Disease; TOD, Target Organ Damage.

Supplementary Figure S1. ROC Curves for 30-day Mortality Prediction Using Diastolic Blood Pressure Parameters.



Abbreviations: BP, Blood Pressure; DBP, Diastolic Blood Pressure; DBP-1h, Achieved Diastolic Blood Pressure at 1 hour; DBP-PR, Diastolic Blood Pressure Percentage Reduction; ROC, Receiver Operating Characteristic; AUC, Area Under the Curve.

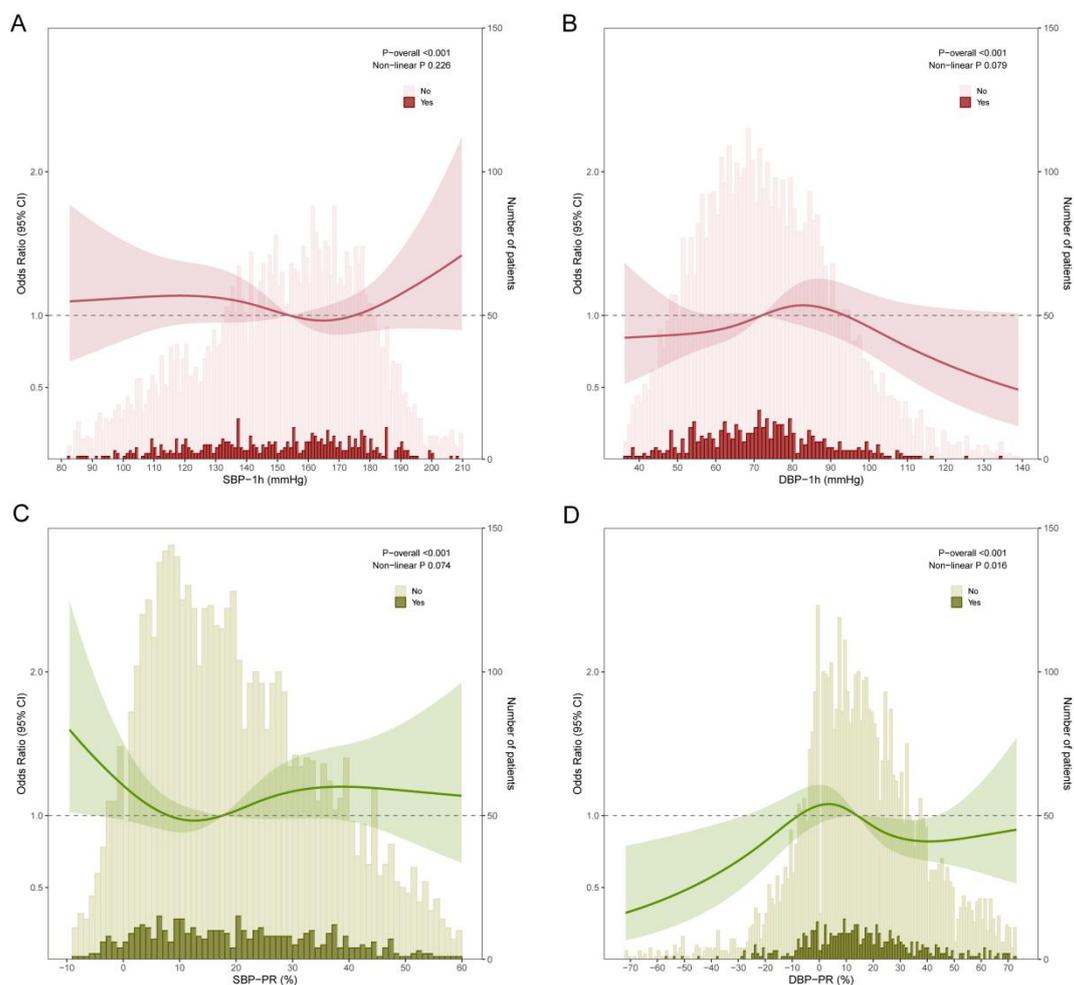
Supplementary Figure S2. Restricted cubic spline (RCS) curves for blood pressure parameters and incidence of Stage 3 AKI.



Non-linear associations between (A) SBP-1h, (B) DBP-1h, (C) SBP-PR, and (D) DBP-PR and the risk of developing Stage 3 Acute Kidney Injury, derived from the multivariable logistic regression model (Model 2). Estimated probabilities of the endpoint are presented alongside the underlying frequency distribution of the cohort and specific AKI events. Visualization is limited to the 1st to 99th percentile range of the blood pressure parameters to maintain focus on clinically representative data and reduce statistical noise from extreme values.

Abbreviations: RCS, Restricted Cubic Splines; SBP-1h, Achieved Systolic Blood Pressure at 1 hour; DBP-1h, Achieved Diastolic Blood Pressure at 1 hour; SBP-PR, Systolic Blood Pressure Percentage Reduction; DBP-PR, Diastolic Blood Pressure Percentage Reduction; AKI, Acute Kidney Injury; OR, Odds Ratio; CI, Confidence Interval.

Supplementary Figure S3. Restricted cubic spline (RCS) curves for blood pressure parameters and incidence of coma.



Non-linear associations between (A) SBP-1h, (B) DBP-1h, (C) SBP-PR, and (D) DBP-PR and the subsequent risk of coma, estimated using the multivariable logistic regression model (Model 2). The curves illustrate the predicted incidence across the parameters, superimposed with data frequency distributions for both the total sample and coma events. Graphical displays are truncated at the 1st and 99th percentiles of the independent variables to provide a robust interpretation of core trends within the majority of the study population.

Abbreviations: RCS, Restricted Cubic Splines; SBP-1h, Achieved Systolic Blood Pressure at 1 hour; DBP-1h, Achieved Diastolic Blood Pressure at 1 hour; SBP-PR, Systolic Blood Pressure Percentage Reduction; DBP-PR, Diastolic Blood Pressure Percentage Reduction; OR, Odds Ratio; CI, Confidence Interval.