Pulse Pressure

Cambridge MA, United States

Abstract

Objective. To study the characteristics of patients across pulse pressure.

Keywords: Intensive Care Unit, Pulse Pressure

1. Materials and Methods

- All statistical analysis was performed using R. Baseline comparisons were
- $_{\scriptscriptstyle 3}$ performed using χ^2 tests for equal proportion with results reported as num-
- $_{4}~$ bers, percentages, and 95% confidence intervals. Continuously variables were
- 5 compared using Pearson's correlation coefficient from a linear model of cor-
- 6 relation reported as medians and interquartile ranges for quartiles of pulse
- 7 pressure.

8 2. Results

Table 1:	Characteristsics	of study	cohorts:	Demographics	and Outcomes.

Table 1. Characteristists	No. (%) of Patients			
	Septic Cohort	CCU (nonseptic)	GI bleed	
	(N = 9566)	(N=2579)	(N = 1214)	
Gender (males)	5251 (54.9)	1578 (61.2)	696 (57.3)	
Service type:				
MICU	5178 (54.1)	0 (0.0)	819 (67.5)	
CCU	1175 (12.3)	2579 (100.0)	142 (11.7)	
SICU	2028 (21.2)	0(0.0)	189 (15.6)	
CSRU	1185 (12.4)	0(0.0)	64 (5.3)	
Primary Outcomes:	, ,	, ,		
ICU Mortality	1083 (11.3)	129 (5.0)	151 (12.4)	
Hospital Mortality	1635 (17.1)	174(6.7)	262 (21.6)	
28-day Mortality	1793 (18.7)	216 (8.4)	276(22.7)	
1-year Mortality	3417(35.7)	410 (15.9)	497 (40.9)	
2-year Mortality	4100 (42.9)	520 (20.2)	580 (47.8)	
		Median (IQR)		
Age, yrs	$65.1\ (24.3)$	$67.2\ (21.7)$	68.8 (24.3)	
SOFA Day 1	6.0 (6.0)	2.0(4.0)	4.0(6.0)	
SOFA Day 2	5.0(6.0)	2.0(4.0)	4.0(5.0)	
SOFA Day 3	3.0(3.0)	2.0(3.0)	3.0(3.0)	
SAPS-I Day 1	14.0 (8.0)	10.0 (6.0)	$13.0\ (7.0)$	
SAPS-I Day 2	$13.0\ (7.0)$	$9.0\ (7.0)$	13.0 (6.0)	
SAPS-I Day 3	9.0 (5.0)	8.0 (5.0)	9.0(4.8)	
Secondary Outcomes:				
ICU Length-of-stay, days	2.8 (4.8)	1.7(2.1)	2.8(4.4)	
ElixHauser Score	5.0 (9.0)	0.0 (5.0)	5.0 (10.0)	

Table 2: Characteristsics of study cohorts: ICD-9 codes and Combordities.

	No	o. $(\%)$ of Patients	5
	Septic Cohort	CCU (nonseptic)	GI bleed
	(N = 9566)	(N = 2579)	(N = 1214)
Combordities:			
Diabetes	3131 (32.7)	735 (28.5)	350 (28.8)
CHF	3654 (38.2)	612(23.7)	410 (33.8)
Alcohol abuse	590 (6.2)	95(3.7)	106 (8.7)
Arrhythmias	2670(27.9)	453 (17.6)	351 (28.9)
Valvular disease	1278 (13.4)	269 (10.4)	175 (14.4)
Hypertension	3590(37.5)	1001 (38.8)	442 (36.4)
Renal failure	1500 (15.7)	164 (6.4)	184 (15.2)
Chronic Pulmonary	2307(24.1)	432 (16.8)	260 (21.4)
Liver disease	1076 (11.2)	51 (2.0)	187 (15.4)
Cancer	574 (6.0)	45 (1.7)	81 (6.7)
Psychosis	423(4.4)	51(2.0)	50(4.1)
Depression	852 (6.2)	88 (3.7)	90 (8.7)

		Pulse Press	ure (Day 1)		
	[3, 50)	[50, 61)	[61, 73.5)	[73.5, 143]	Missing
	. , ,	N	(%)	. , ,	
M	991 (9.8)	976 (9.7)	1118 (11.1)	1263 (12.5)	
F	1422 (14.1)	1318 (13.0)	1350 (13.4)	1230 (12.2)	
WHITE	72 (0.7)	53 (0.5)	51 (0.5)	45 (0.4)	
BLACK	241 (2.4)	207 (2.0)	268 (2.7)	306 (3.0)	
HISPANIC	72(0.7)	66(0.7)	73 (0.7)	63(0.6)	
ASIAN	368 (3.6)	302 (3.0)	335 (3.3)	321 (3.2)	
OTHER	1660 (16.4)	1666 (16.5)	1741 (17.2)	1758 (17.4)	
0x VSP	1180 (11.7)	1349 (13.4)	1760 (17.4)	2167(21.4)	
1x VSP	638 (6.3)	617 (6.1)	475 (4.7)	234 (2.3)	
2x VSP	314 (3.1)	221(2.2)	152(1.5)	76 (0.8)	
3x VSP	188 (1.9)	85 (0.8)	64 (0.6)	12(0.1)	
4x VSP	72 (0.7)	19 (0.2)	15(0.1)	4 (0.0)	
5x VSP	17(0.2)	2(0.0)	2(0.0)	0 (0.0)	
6x VSP	4 (0.0)	1(0.0)	0 (0.0)	0 (0.0)	
VNT	1192 (11.8)	1053 (10.4)	1061 (10.5)	928 (9.2)	
SD	1089 (10.8)	967 (9.6)	917 (9.1)	732 (7.2)	
BB	493 (4.9)	507(5.0)	751 (7.4)	1042 (10.3)	
		Mediar	ı (IQR)		
WEIGHT	77.00 (27.55)	79.20 (28.90)	79.30 (27.78)	76.20 (27.50)	-0.0443*
AGE	59.46 (21.55)	62.39(24.73)	68.22 (23.35)	71.76 (19.57)	0.2322*
ELIX28DPT	5.00(10.00)	5.00(9.00)	4.00(9.00)	5.00(9.00)	-0.0050
TCO2	23.00 (6.50)	24.00 (5.50)	24.00 (5.50)	24.50 (5.50)	0.0440*
CREATININE	1.05 (1.05)	1.05(1.10)	1.10(1.10)	1.20(1.45)	0.0097*
POTASSIUM	$4.10 \ (0.75)$	4.10 (0.70)	4.10(0.70)	4.10(0.70)	-0.0008*
CHLORIDE	106.00 (8.00)	$106.00\ (7.50)$	$105.50 \ (7.00)$	105.00 (8.00)	-0.0126*
SODIUM	138.50 (5.00)	139.00 (5.50)	139.00 (6.00)	139.00 (5.00)	0.0254*
BUN	22.00(25.88)	22.00(24.00)	24.00 (26.00)	28.00(29.00)	0.1845*
CALCIUM	8.00(1.15)	8.10(1.00)	8.20(1.05)	8.35 (0.95)	0.0099*
MAGNESIUM	1.90 (0.45)	1.90 (0.40)	1.95 (0.35)	1.95 (0.40)	0.0001
WBC	11.50 (9.23)	$11.40 \ (8.25)$	$11.20 \ (7.20)$	$10.90 \ (6.70)$	-0.0305*
LACTATE	2.20(2.20)	2.00(1.75)	1.80 (1.50)	1.60 (1.22)	-0.0295*
ALT	$38.00 \ (68.00)$	31.00 (53.00)	$30.00 \ (45.00)$	$27.00 \ (46.50)$	-0.7697
AST	$59.00\ (124.75)$	49.00 (84.00)	40.00 (71.00)	35.00 (54.88)	-2.8999*
SBP	$103.00 \ (13.00)$	$111.00 \ (15.00)$	$120.00 \ (16.50)$	137.00 (20.50)	0.8376*
DBP	$59.00\ (11.00)$	$56.00 \ (12.50)$	$55.50 \ (15.50)$	$56.00\ (17.00)$	-0.0722*
HR	94.00 (24.00)	89.00 (20.88)	86.00 (21.00)	80.00 (21.00)	-0.3131*
RR	$19.00 \ (7.00)$	18.00 (6.00)	18.00 (5.00)	18.00(5.00)	-0.0225*
SPO2	98.00 (3.00)	98.00(2.00)	98.00 (2.50)	98.00 (2.00)	0.0136*
TEMP	98.20 (1.70)	98.35 (1.60)	98.40 (1.45)	98.30 (1.39)	0.0035*
UO	1664.50 (2195.00)	1865.00 (2124.00)	1908.50 (2042.75)	1811.50 (1902.75)	4.6306*
PH	7.36 (0.10)	7.38 (0.08)	7.38 (0.09)	7.38 (0.08)	-0.0021
PAO2	119.00 (68.00)	119.50 (64.67)	123.00 (74.00)	118.00 (66.00)	0.0326
HEMOG	$10.50 \ (2.45)$	$10.30 \ (2.15)$	$10.20 \ (2.20)$	$10.20\ (2.20)$	-0.0083*

Table 3: Characteristsics of Sepsis patients (Angus Criteria) on Day 1 (N = 9,566)

		Pulse Press	ure (Day 2)		
	[3, 50)	[50, 61)	[61, 73.5)	[73.5, 143]	Missing
	. , ,	N ((%)	. , ,	
M	898 (10.3)	823 (9.5)	917 (10.6)	1031 (11.9)	
F	1248 (14.4)	1142 (13.2)	1105 (12.7)	1043 (12.0)	
WHITE	55 (0.6)	44 (0.5)	39 (0.4)	44 (0.5)	
BLACK	230 (2.6)	176(2.0)	192 (2.2)	259 (3.0)	
HISPANIC	68 (0.8)	57 (0.7)	54 (0.6)	50 (0.6)	
ASIAN	308 (3.5)	281 (3.2)	303 (3.5)	247 (2.8)	
OTHER	1485 (17.1)	1407 (16.2)	1434 (16.5)	1474 (17.0)	
0x VSP	1185 (13.6)	1358 (15.6)	1558 (17.9)	1849 (21.3)	
1x VSP	542 (6.2)	410 (4.7)	323 (3.7)	177 (2.0)	
2x VSP	254 (2.9)	137 (1.6)	101 (1.2)	41 (0.5)	
3x VSP	125(1.4)	41 (0.5)	30 (0.3)	5 (0.1)	
4x VSP	33 (0.4)	18 (0.2)	8 (0.1)	2(0.0)	
5x VSP	3(0.0)	1 (0.0)	2(0.0)	0 (0.0)	
6x VSP	4 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
VNT	95 (1.1)	68 (0.8)	69 (0.8)	72(0.8)	
SD	811 (9.3)	657 (7.6)	545 (6.3)	486 (5.6)	
BB	411 (4.7)	478 (5.5)	551 (6.3)	822 (9.5)	
		Mediar	(IQR)		
WEIGHT	77.50 (27.20)	78.50 (28.80)	79.10 (28.40)	77.00 (27.80)	-0.0384*
AGE	59.45(21.62)	62.77(24.22)	$68.81\ (22.50)$	$72.34\ (17.91)$	0.2465*
ELIX28DPT	5.00(10.00)	5.00(9.00)	5.00(9.00)	5.00(9.00)	-0.0017
TCO2	$23.50\ (7.00)$	24.00 (6.00)	24.00 (6.00)	24.50 (6.00)	0.0319*
CREATININE	1.10(1.15)	1.10(1.20)	1.20(1.30)	1.30(1.50)	0.0056*
POTASSIUM	4.05 (0.70)	4.00(0.70)	4.00(0.70)	4.00(0.70)	-0.0012*
CHLORIDE	106.00 (9.00)	106.00 (7.00)	106.00 (8.00)	106.00 (8.00)	0.0141*
SODIUM	138.00 (6.00)	138.50 (5.00)	139.00 (6.00)	140.00 (5.50)	0.0363*
BUN	23.00(27.00)	23.00(27.00)	26.00 (28.88)	29.00 (28.50)	0.1393*
CALCIUM	8.05 (0.90)	8.20 (0.80)	8.20 (0.90)	8.30 (0.80)	0.0055*
MAGNESIUM	2.00(0.40)	2.00(0.35)	2.00(0.31)	2.00(0.40)	0.0001
WBC	11.00 (8.75)	11.10 (7.90)	10.90 (6.97)	11.30 (6.60)	-0.0165*
LACTATE	1.90(1.95)	1.62(1.14)	1.50 (0.90)	1.30(0.90)	-0.0365*
ALT	$49.25 \ (114.25)$	$43.00\ (107.00)$	44.00 (99.75)	34.00 (93.00)	-0.5808
AST	$69.00 \ (159.25)$	$63.50 \ (134.12)$	57.00 (110.00)	42.00 (98.00)	-4.9875*
SBP	102.00 (13.00)	$112.00 \ (15.00)$	$122.50 \ (17.00)$	141.00 (21.00)	0.9310*
DBP	$59.00\ (12.50)$	$57.00 \ (13.50)$	$57.00\ (17.50)$	$56.50 \ (17.00)$	-0.0614*
HR	92.50 (23.62)	87.00 (21.00)	84.50 (21.00)	80.00 (21.00)	-0.2755*
RR	$19.50 \ (7.00)$	19.00 (6.00)	19.00 (6.00)	19.00 (6.00)	-0.0098*
SPO2	97.00 (3.00)	97.00 (3.00)	98.00 (3.00)	98.00(3.00)	0.0196*
TEMP	98.40 (1.77)	98.40 (1.62)	98.50 (1.50)	98.50 (1.40)	0.0012
UO	$1410.00 \ (1822.75)$	1495.00 (1896.25)	1565.00 (1974.50)	1765.00 (2034.00)	8.5058*
PH	7.38(0.09)	7.39 (0.08)	7.39 (0.08)	7.40 (0.08)	-0.0004
PAO2	100.00 (44.50)	101.00 (44.00)	$106.50 \ (45.00)$	104.00 (50.00)	0.0308
HEMOG	10.15 (2.00)	$10.10 \ (1.81)$	10.00 (1.90)	$10.00 \ (1.65)$	-0.0047*

Table 4: Characteristsics of Sepsis patients (Angus Criteria) on Day 2 (N = 9,566)

		Pulse Press	ure (Day 3)		
	[-46, 50)	[50, 60.5)	[60.5, 72.5)	[72.5, 133.5]	Missing
N	1953	2106	1814	1937	1756
	[3, 50)	[50, 61)	[61, 73.5)	[73.5, 143]	Missing
		N	(%)		
M	653 (9.9)	709 (10.8)	712 (10.8)	788 (12.0)	
F	897 (13.6)	915 (13.9)	832 (12.7)	844 (12.8)	
WHITE	39(0.6)	35 (0.5)	31 (0.5)	33 (0.5)	
BLACK	154(2.3)	167(2.5)	147(2.2)	199(3.0)	
HISPANIC	42(0.6)	52(0.8)	38 (0.6)	27(0.4)	
ASIAN	224 (3.4)	248 (3.8)	242 (3.7)	207(3.1)	
OTHER	1091 (16.6)	1122 (17.1)	1086 (16.5)	1166 (17.7)	
0x VSP	884 (13.4)	1153 (17.5)	1229 (18.7)	1466 (22.3)	
1x VSP	376(5.7)	320 (4.9)	228(3.5)	147(2.2)	
2x VSP	180(2.7)	107(1.6)	65(1.0)	15(0.2)	
3x VSP	83 (1.3)	35(0.5)	15(0.2)	4 (0.1)	
4x VSP	23(0.3)	8 (0.1)	7(0.1)	0(0.0)	
5x VSP	4 (0.1)	1(0.0)	0(0.0)	0(0.0)	
VNT	54 (0.8)	51 (0.8)	68 (1.0)	74 (1.1)	
SD	657 (10.0)	613 (9.3)	461 (7.0)	412 (6.3)	
BB	328 (5.0)	375(5.7)	453(6.9)	635 (9.7)	
		Mediar	ı (IQR)		
WEIGHT	76.90 (26.70)	78.50 (29.58)	80.00 (29.40)	77.95 (27.00)	-0.0149
AGE	$58.82\ (22.23)$	$64.10 \ (25.38)$	69.18 (22.43)	72.28 (17.88)	0.2412*
ELIX28DPT	$6.00\ (10.00)$	5.00 (10.00)	$5.00\ (10.00)$	5.00 (8.25)	-0.0059
TCO2	24.00 (6.00)	25.00(6.00)	25.00(6.00)	25.00(6.00)	0.0244*
CREATININE	1.10(1.30)	1.10(1.20)	1.10(1.27)	1.30(1.45)	0.0041*
POTASSIUM	4.00 (0.65)	4.00 (0.60)	3.90(0.60)	3.95 (0.65)	-0.0017*
CHLORIDE	105.00 (8.50)	$106.00 \ (8.50)$	106.00 (8.50)	106.00 (8.00)	0.0213*
SODIUM	$138.00 \ (6.00)$	139.00 (6.00)	$140.00 \ (6.50)$	140.00 (6.00)	0.0375*
BUN	25.50 (29.50)	24.00 (29.50)	27.25 (27.62)	30.00 (30.00)	0.1341*
CALCIUM	$8.10 \ (0.95)$	8.15 (0.90)	$8.20 \ (0.85)$	8.25 (0.80)	0.0039*
MAGNESIUM	2.00 (0.35)	2.00 (0.35)	2.00 (0.45)	2.00(0.40)	0.0005
WBC	11.00 (7.90)	$10.80 \ (7.23)$	10.60 (6.90)	10.75 (6.20)	-0.0131*
LACTATE	1.85(1.77)	1.60 (0.95)	1.50 (1.00)	1.20 (0.70)	-0.0353*
ALT	$57.00 \ (135.50)$	$43.00\ (110.00)$	$45.00 \ (111.75)$	$30.00\ (77.25)$	-0.1808
AST	$74.50 \ (184.88)$	$61.50 \ (135.50)$	$49.00 \ (101.25)$	42.00 (64.50)	-3.8346*
SBP	$102.00 \ (13.50)$	113.00 (14.00)	$125.00 \ (18.50)$	143.00 (21.00)	0.9512*
DBP	59.00 (13.00)	$58.00 \ (13.50)$	58.00 (18.00)	$57.50\ (17.00)$	-0.0464*
HR	92.00(23.00)	87.00 (20.00)	$83.50\ (20.00)$	$78.50 \ (18.00)$	-0.2600*
RR	20.00(7.00)	19.00 (6.50)	19.00 (6.00)	19.00 (6.00)	-0.0100*
SPO2	97.00 (3.00)	97.50 (3.00)	97.50 (3.00)	97.75 (3.00)	0.0177*
TEMP	98.40 (1.85)	98.40 (1.60)	98.42 (1.60)	98.40 (1.60)	0.0005
UO	1420.00 (2038.00)	1670.00 (2167.50)	1790.00 (2325.00)	1940.00 (2458.00)	13.2291*
PH	7.39(0.09)	7.40 (0.08)	7.39(0.09)	7.40 (0.08)	-0.0017
PAO2	100.00 (40.25)	$101.00 \ (42.75)$	101.50 (41.00)	106.50 (45.00)	0.0702
HEMOG	10.10 (1.70)	10.10 (1.80)	10.00(1.60)	10.00(1.60)	-0.0035*

Table 5: Characteristsics of Sepsis patients (Angus Criteria) on Day 3 (N = 9,566)

		Pulse Press	sure (Day 1)		
	[21, 46.5)	[46.5, 58)	[58, 70)	[70, 120]	Missing
		N	(%)		
M	178 (7.0)	194 (7.6)	235 (9.2)	324 (12.7)	
F	419 (16.4)	428 (16.8)	320 (12.5)	313 (12.3)	
WHITE	9 (0.4)	9 (0.4)	4 (0.2)	4 (0.2)	
BLACK	34 (1.3)	31 (1.2)	31 (1.2)	31 (1.2)	
HISPANIC	9 (0.4)	17 (0.7)	9 (0.4)	11 (0.4)	
ASIAN	135 (5.3)	175 (6.8)	153 (6.0)	175(6.8)	
OTHER	410 (16.0)	390 (15.3)	$358\ (14.0)$	$416\ (16.3)$	
0x VSP	382 (15.0)	479 (18.7)	460 (18.0)	529 (20.7)	
1x VSP	133 (5.2)	97 (3.8)	79 (3.1)	92 (3.6)	
2x VSP	51(2.0)	34 (1.3)	12(0.5)	14(0.5)	
3x VSP	19(0.7)	7 (0.3)	2 (0.1)	2 (0.1)	
4x VSP	8 (0.3)	5 (0.2)	2(0.1)	0(0.0)	
5x VSP	3(0.1)	0(0.0)	0 (0.0)	0(0.0)	
6x VSP	1 (0.0)	0(0.0)	0(0.0)	0(0.0)	
VNT	141 (5.5)	116 (4.5)	95 (3.7)	121 (4.7)	
SD	131 (5.1)	108 (4.2)	80 (3.1)	103 (4.0)	
BB	295 (11.5)	319 (12.5)	280 (11.0)	296 (11.6)	
		()	ı (IQR)	200 (2210)	
WEIGHT	82.00 (25.20)	82.00 (28.00)	79.40 (25.70)	79.00 (24.90)	-0.1407*
AGE	60.40 (20.86)	62.74(20.84)	70.49 (20.68)	74.83 (15.79)	0.3081*
ELIX28DPT	0.00(5.00)	0.00(5.00)	0.00(5.00)	0.00(5.00)	-0.0111
TCO2	24.00 (5.00)	25.00 (3.50)	25.00 (4.00)	25.00 (4.00)	0.0432*
CREATININE	0.90 (0.40)	$0.90\ (0.50)$	$0.90\ (0.60)$	$1.00\ (0.61)$	0.0075*
POTASSIUM	4.05 (0.50)	4.05 (0.50)	4.00 (0.50)	4.00(0.55)	-0.0019*
CHLORIDE	104.00 (6.00)	104.50 (5.00)	104.00 (5.00)	103.50 (5.50)	-0.0235*
SODIUM	138.00 (4.00)	139.00 (3.50)	139.00 (4.00)	138.50 (5.00)	0.0038
BUN	17.00 (12.00)	17.00 (10.38)	18.00 (13.75)	20.00 (19.00)	0.1575*
CALCIUM	8.47 (0.80)	8.53 (0.70)	8.60 (0.70)	8.50 (0.74)	0.0028*
MAGNESIUM	$1.95\ (0.35)$	1.90 (0.30)	1.90 (0.30)	1.90(0.30)	-0.0009*
WBC	11.10 (5.53)	10.35 (5.00)	10.07(4.76)	9.50 (4.60)	-0.0317*
LACTATE	2.00(2.59)	2.00(2.20)	1.60(1.42)	1.70(1.48)	-0.0351*
ALT	47.00 (58.00)	37.00 (42.00)	30.00 (31.50)	26.00 (31.50)	-1.6706*
AST	117.00 (232.00)	72.75 (126.38)	49.50 (81.25)	35.50 (53.75)	-4.1369*
SBP	102.00 (12.00)	110.00 (12.00)	118.00 (14.50)	130.00 (19.00)	0.7624*
DBP	62.00 (13.00)	60.00 (15.00)	58.00 (15.75)	54.50 (16.00)	-0.1821*
HR	84.50 (25.00)	77.00 (20.50)	75.00 (18.25)	70.00 (17.00)	-0.3511*
RR	18.50 (5.50)	17.50 (4.00)	17.50 (4.00)	$17.75\ (4.00)$	-0.0244*
SPO2	98.00 (3.00)	97.50 (3.00)	97.50 (3.00)	97.00 (3.00)	0.0013
TEMP	98.30 (1.30)	98.10 (1.15)	98.20 (1.16)	98.00 (1.10)	-0.0044
UO	2219.50 (2197.25)	2272.50 (2033.75)	1952.50 (1820.00)	1930.00 (1772.50)	-10.4698
PH	7.38 (0.09)	7.38 (0.08)	7.39 (0.07)	7.40 (0.08)	0.0250
PAO2	117.00 (72.12)	123.00 (99.00)	120.75 (75.75)	128.00 (126.25)	0.5664*
HEMOG	12.20 (2.60)	12.00 (2.70)	11.80 (2.70)	11.00 (2.05)	-0.0305*

Table 6: Characteristsics of CCU patients (non-sepsis) (N = 2,579)

		Pulse Press	ure (Day 2)		
	[21, 46.5)	[46.5, 58)	[58, 70)	[70, 120]	Missing
	•	N	(%)		
M	178 (7.0)	194 (7.6)	235 (9.2)	324 (12.7)	
F	419(16.4)	428 (16.8)	320(12.5)	313 (12.3)	
WHITE	9 (0.4)	9 (0.4)	4 (0.2)	4 (0.2)	
BLACK	34 (1.3)	31 (1.2)	31 (1.2)	31 (1.2)	
HISPANIC	9 (0.4)	17 (0.7)	9 (0.4)	11 (0.4)	
ASIAN	135 (5.3)	175 (6.8)	153 (6.0)	175 (6.8)	
OTHER	410 (16.0)	390 (15.3)	358 (14.0)	$416\ (16.3)$	
0x VSP	382(15.0)	479 (18.7)	460 (18.0)	529(20.7)	
1x VSP	133 (5.2)	97 (3.8)	79 (3.1)	92 (3.6)	
2x VSP	51 (2.0)	34 (1.3)	12(0.5)	14(0.5)	
3x VSP	19(0.7)	7 (0.3)	2(0.1)	2(0.1)	
4x VSP	8 (0.3)	5(0.2)	2(0.1)	0(0.0)	
5x VSP	3 (0.1)	0(0.0)	0(0.0)	0(0.0)	
6x VSP	1 (0.0)	0(0.0)	0(0.0)	0(0.0)	
VNT	141 (5.5)	116 (4.5)	95 (3.7)	121 (4.7)	
SD	131 (5.1)	108(4.2)	80 (3.1)	103 (4.0)	
BB	295 (11.5)	319(12.5)	280 (11.0)	296 (11.6)	
	/ /	Mediar	ı (IQR)	/ /	
WEIGHT	82.00 (25.20)	82.00 (28.00)	79.40 (25.70)	79.00 (24.90)	-0.1407*
AGE	60.40 (20.86)	62.74(20.84)	70.49 (20.68)	74.83 (15.79)	0.3081*
ELIX28DPT	0.00(5.00)	0.00(5.00)	0.00(5.00)	0.00(5.00)	-0.0111
TCO2	24.00 (5.00)	25.00 (3.50)	25.00 (4.00)	25.00 (4.00)	0.0432*
CREATININE	$0.90\ (0.40)$	$0.90\ (0.50)$	$0.90\ (0.60)$	$1.00\ (0.61)$	0.0075*
POTASSIUM	4.05(0.50)	4.05(0.50)	4.00(0.50)	4.00(0.55)	-0.0019*
CHLORIDE	104.00 (6.00)	104.50 (5.00)	104.00 (5.00)	103.50 (5.50)	-0.0235*
SODIUM	138.00 (4.00)	139.00 (3.50)	139.00 (4.00)	138.50 (5.00)	0.0038
BUN	17.00 (12.00)	17.00 (10.38)	18.00 (13.75)	20.00 (19.00)	0.1575*
CALCIUM	8.47 (0.80)	$8.53\ (0.70)$	$8.60\ (0.70)$	8.50 (0.74)	0.0028*
MAGNESIUM	1.95(0.35)	1.90 (0.30)	1.90(0.30)	1.90(0.30)	-0.0009*
WBC	11.10(5.53)	10.35(5.00)	10.07(4.76)	9.50 (4.60)	-0.0317*
LACTATE	2.00(2.59)	2.00(2.20)	1.60(1.42)	1.70(1.48)	-0.0351*
ALT	47.00 (58.00)	37.00 (42.00)	30.00 (31.50)	26.00 (31.50)	-1.6706*
AST	117.00 (232.00)	72.75 (126.38)	49.50 (81.25)	35.50 (53.75)	-4.1369*
SBP	102.00 (12.00)	110.00 (12.00)	118.00 (14.50)	130.00 (19.00)	0.7624*
DBP	62.00 (13.00)	60.00 (15.00)	58.00 (15.75)	54.50 (16.00)	-0.1821*
HR	84.50 (25.00)	77.00 (20.50)	75.00 (18.25)	70.00 (17.00)	-0.3511*
RR	18.50 (5.50)	17.50 (4.00)	17.50 (4.00)	17.75 (4.00)	-0.0244*
SPO2	98.00 (3.00)	97.50 (3.00)	97.50 (3.00)	97.00 (3.00)	0.0013
TEMP	98.30 (1.30)	98.10 (1.15)	98.20 (1.16)	98.00 (1.10)	-0.0044
UO	2219.50 (2197.25)	2272.50 (2033.75)	1952.50 (1820.00)	1930.00 (1772.50)	-10.4698*
PH	7.38 (0.09)	7.38 (0.08)	7.39 (0.07)	7.40 (0.08)	0.0250
PAO2	117.00 (72.12)	123.00 (99.00)	120.75 (75.75)	128.00 (126.25)	0.5664*
HEMOG	12.20 (2.60)	12.00 (2.70)	11.80 (2.70)	11.00 (2.05)	-0.0305*

Table 7: Characteristsics of CCU patients (non-sepsis) (N = 2,579)

		Pulse Press	ure (Day 3)		
	[21, 46.5)	[46.5, 58)	[58, 70)	[70, 120]	Missing
		N	(%)		
M	178 (7.0)	194 (7.6)	235 (9.2)	324 (12.7)	
F	419(16.4)	428 (16.8)	320(12.5)	313 (12.3)	
WHITE	9 (0.4)	9 (0.4)	4 (0.2)	4 (0.2)	
BLACK	34 (1.3)	31 (1.2)	31 (1.2)	31 (1.2)	
HISPANIC	9 (0.4)	17 (0.7)	9 (0.4)	11 (0.4)	
ASIAN	135 (5.3)	175(6.8)	153 (6.0)	175(6.8)	
OTHER	410 (16.0)	390 (15.3)	358 (14.0)	416 (16.3)	
0x VSP	382 (15.0)	479 (18.7)	460 (18.0)	529 (20.7)	
1x VSP	133 (5.2)	97 (3.8)	79 (3.1)	92 (3.6)	
2x VSP	51(2.0)	34 (1.3)	12(0.5)	14(0.5)	
3x VSP	19(0.7)	7 (0.3)	2(0.1)	2(0.1)	
4x VSP	8 (0.3)	5 (0.2)	2(0.1)	0 (0.0)	
5x VSP	3 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	
6x VSP	1(0.0)	0(0.0)	0(0.0)	0(0.0)	
VNT	141(5.5)	116(4.5)	95 (3.7)	121(4.7)	
SD	131 (5.1)	108 (4.2)	80 (3.1)	103 (4.0)	
BB	295 (11.5)	319 (12.5)	280 (11.0)	296 (11.6)	
		Mediar	ı (IQR)		
WEIGHT	82.00 (25.20)	82.00 (28.00)	79.40 (25.70)	79.00 (24.90)	-0.1407*
AGE	60.40(20.86)	62.74(20.84)	70.49 (20.68)	74.83 (15.79)	0.3081*
ELIX28DPT	0.00(5.00)	0.00(5.00)	0.00(5.00)	0.00(5.00)	-0.0111
TCO2	24.00(5.00)	25.00(3.50)	25.00 (4.00)	25.00 (4.00)	0.0432*
CREATININE	0.90(0.40)	0.90(0.50)	0.90(0.60)	1.00(0.61)	0.0075*
POTASSIUM	4.05(0.50)	4.05(0.50)	4.00(0.50)	4.00(0.55)	-0.0019*
CHLORIDE	104.00 (6.00)	104.50 (5.00)	104.00(5.00)	103.50 (5.50)	-0.0235*
SODIUM	138.00 (4.00)	139.00 (3.50)	139.00 (4.00)	138.50 (5.00)	0.0038
BUN	17.00 (12.00)	17.00 (10.38)	18.00 (13.75)	20.00 (19.00)	0.1575*
CALCIUM	8.47(0.80)	8.53 (0.70)	8.60 (0.70)	8.50 (0.74)	0.0028*
MAGNESIUM	1.95 (0.35)	1.90(0.30)	1.90(0.30)	1.90(0.30)	-0.0009*
WBC	11.10 (5.53)	10.35 (5.00)	10.07 (4.76)	9.50(4.60)	-0.0317*
LACTATE	2.00(2.59)	2.00(2.20)	1.60(1.42)	1.70(1.48)	-0.0351*
ALT	47.00 (58.00)	37.00 (42.00)	30.00 (31.50)	26.00 (31.50)	-1.6706*
AST	117.00 (232.00)	$72.75 \ (126.38)$	49.50 (81.25)	35.50 (53.75)	-4.1369*
SBP	102.00 (12.00)	110.00 (12.00)	$118.00 \ (14.50)$	130.00 (19.00)	0.7624*
DBP	$62.00\ (13.00)$	$60.00 \ (15.00)$	$58.00 \ (15.75)$	$54.50 \ (16.00)$	-0.1821*
HR	84.50 (25.00)	77.00 (20.50)	$75.00 \ (18.25)$	70.00 (17.00)	-0.3511*
RR	$18.50 \ (5.50)$	$17.50 \ (4.00)$	$17.50 \ (4.00)$	17.75 (4.00)	-0.0244*
SPO2	98.00(3.00)	97.50 (3.00)	97.50 (3.00)	97.00(3.00)	0.0013
TEMP	98.30 (1.30)	98.10 (1.15)	98.20 (1.16)	98.00 (1.10)	-0.0044
UO	$2219.50 \ (2197.25)$	$2272.50 \ (2033.75)$	$1952.50 \ (1820.00)$	$1930.00 \ (1772.50)$	-10.4698*
PH	7.38 (0.09)	7.38 (0.08)	7.39 (0.07)	7.40 (0.08)	0.0250
PAO2	$117.00 \ (72.12)$	123.00 (99.00)	120.75 (75.75)	$128.00 \ (126.25)$	0.5664*
HEMOG	$12.20 \ (2.60)$	12.00(2.70)	$11.80 \ (2.70)$	11.00 (2.05)	-0.0305*

Table 8: Characteristsics of CCU patients (non-sepsis) (N = 2,579)

	Pulse Pressure (Day 1)						
	[18, 52)	[52, 61.5)	(61.5, 74)	[74, 137]	Missing		
			(%)				
M	123 (9.8)	108 (8.6)	141 (11.3)	155 (12.4)			
F	185 (14.8)	199 (15.9)	153 (12.2)	155 (12.4)			
WHITE	8 (0.6)	9 (0.7)	6(0.5)	5 (0.4)			
BLACK	29(2.3)	26 (2.1)	38 (3.0)	43 (3.4)			
HISPANIC	14 (1.1)	13 (1.0)	3(0.2)	6 (0.5)			
ASIAN	41 (3.3)	43 (3.4)	42 (3.4)	32(2.6)			
OTHER	216 (17.2)	216 (17.2)	205 (16.4)	224 (17.9)			
0x VSP	183 (14.6)	232 (18.5)	250 (20.0)	292 (23.3)			
1x VSP	63 (5.0)	45 (3.6)	29 (2.3)	13 (1.0)			
2x VSP	30 (2.4)	16 (1.3)	8 (0.6)	4 (0.3)			
3x VSP	18 (1.4)	11 (0.9)	5(0.4)	1(0.1)			
4x VSP	13 (1.0)	3 (0.2)	2(0.2)	0(0.0)			
5x VSP	1 (0.1)	0(0.0)	0(0.0)	0(0.0)			
VNT	135 (10.8)	107 (8.5)	83 (6.6)	71 (5.7)			
SD	129 (10.3)	100 (8.0)	86 (6.9)	53 (4.2)			
BB	44 (3.5)	71 (5.7)	78 (6.2)	121 (9.7)			
	()	(/	ı (IQR)	(/			
WEIGHT	72.95 (27.00)	78.60 (28.80)	78.15 (31.08)	74.00 (25.97)	-0.0325		
AGE	60.56 (22.29)	60.79 (29.06)	70.84 (22.56)	76.02 (14.09)	0.2986*		
ELIX28DPT	5.00 (9.00)	5.00 (10.00)	4.00 (10.00)	5.00 (9.00)	-0.0212		
TCO2	22.50 (6.50)	24.00 (6.00)	23.00(5.50)	24.00 (6.00)	0.0364*		
CREATININE	$0.93\ (0.99)$	1.00 (0.91)	1.08 (1.05)	1.10(1.10)	0.0098*		
POTASSIUM	4.05 (0.70)	4.00 (0.60)	4.10 (0.60)	3.90(0.65)	-0.0009		
CHLORIDE	107.00 (8.00)	106.00 (8.00)	107.00 (6.00)	106.00 (6.00)	-0.0188		
SODIUM	139.00 (6.00)	139.50 (6.50)	140.00 (4.50)	140.00 (5.12)	0.0197*		
BUN	23.00 (25.50)	24.00 (26.12)	27.00 (31.75)	27.75 (26.25)	0.1297*		
CALCIUM	7.95 (1.20)	8.05 (0.90)	8.05 (0.85)	8.28 (0.85)	0.0085*		
MAGNESIUM	1.90 (0.40)	1.90 (0.40)	1.90 (0.35)	1.90 (0.40)	-0.0002		
WBC	10.80 (8.25)	11.05 (9.21)	10.30 (8.62)	10.80 (6.47)	-0.0015		
LACTATE	2.35 (2.40)	2.20 (1.43)	1.98 (1.85)	1.90 (1.30)	-0.0284		
ALT	31.75 (62.75)	28.00 (36.25)	29.00 (37.50)	23.00 (36.00)	0.7918		
AST	56.50 (129.25)	50.00 (76.00)	40.00 (61.50)	32.00 (36.00)	-0.0879		
SBP	104.00 (14.00)	112.00 (15.00)	122.25 (20.38)	140.25 (22.38)	0.8715*		
DBP	58.00 (11.12)	54.50 (12.25)	55.75 (17.00)	57.00 (15.00)	-0.0175		
HR	94.00 (24.62)	86.50 (25.25)	85.75 (21.88)	80.00 (20.00)	-0.2820		
RR	18.00 (5.50)	19.00 (6.00)	19.00 (6.00)	18.00 (5.00)	-0.0047		
SPO2	98.00 (2.50)	98.00 (2.00)	98.00 (2.00)	98.00 (2.00)	0.0062		
TEMP	98.20 (1.50)	98.20 (1.50)	98.20 (1.40)	98.30 (1.40)	0.0002		
UO	1415.00 (1608.50)	1680.00 (1891.25)	2065.00 (2015.00)	1800.00 (1427.50)	4.5197		
PH	7.34 (0.11)	7.37 (0.12)	7.38 (0.11)	7.39 (0.09)	-0.0009		
PAO2	118.00 (59.00)	121.25 (75.50)	120.50 (63.38)	113.50 (66.00)	0.3094		
HEMOG	10.30 (1.96)	$10.20 \ (1.65)$	10.10 (2.17)	10.02 (2.00)	-0.0019		
11111100	10.00 (1.00)	10.20 (1.00)	10.10 (2.11)	10.02 (2.00)	-0.0013		

Table 9: Characteristsics of GI Bleed patients on Day 1 (N = 1,214)

Pulse Pressure (Day 2)							
	[18, 52)	[52, 61.5)	[61.5, 74)	[74, 137]	Missing		
		N	(%)				
M	100 (9.4)	96 (9.0)	108 (10.1)	130 (12.2)			
F	148 (13.9)	169 (15.8)	141 (13.2)	119 (11.1)			
WHITE	8 (0.7)	7 (0.7)	8 (0.7)	3(0.3)			
BLACK	25(2.3)	18 (1.7)	27(2.5)	33 (3.1)			
HISPANIC	11 (1.0)	7(0.7)	5(0.5)	3(0.3)			
ASIAN	36 (3.4)	37 (3.5)	33 (3.1)	31 (2.9)			
OTHER	168 (15.7)	196 (18.4)	176 (16.5)	179 (16.8)			
0x VSP	162 (15.2)	210 (19.7)	213 (19.9)	229(21.4)			
1x VSP	39 (3.7)	34 (3.2)	27(2.5)	13 (1.2)			
2x VSP	23 (2.2)	16(1.5)	5(0.5)	7 (0.7)			
3x VSP	17(1.6)	3 (0.3)	2(0.2)	0(0.0)			
4x VSP	7 (0.7)	1(0.1)	2(0.2)	0(0.0)			
5x VSP	0(0.0)	1(0.1)	0(0.0)	0(0.0)			
VNT	10 (0.9)	14 (1.3)	6(0.6)	9 (0.8)			
SD	101 (9.5)	80 (7.5)	61(5.7)	38 (3.6)			
BB	46 (4.3)	64 (6.0)	70 (6.6)	95 (8.9)			
		Mediar	ı (IQR)				
WEIGHT	74.95 (27.22)	79.00 (30.40)	77.75 (25.90)	75.05 (26.50)	-0.0228		
AGE	60.38 (21.69)	66.81 (27.79)	71.08 (22.87)	76.30 (14.39)	0.2502*		
ELIX28DPT	6.00(8.75)	5.00 (10.00)	5.00 (10.00)	5.00 (10.00)	-0.0218		
TCO2	23.00 (8.00)	24.00 (5.88)	24.00 (6.00)	24.00 (5.25)	0.0259*		
CREATININE	1.00 (1.32)	1.00(1.04)	1.10(1.18)	1.10(1.10)	0.0039		
POTASSIUM	4.00 (0.80)	4.00(0.60)	3.98(0.60)	$3.90\ (0.60)$	-0.0013		
CHLORIDE	107.00 (10.00)	106.75 (7.00)	107.50 (7.50)	106.00 (8.00)	-0.0043		
SODIUM	140.00 (7.00)	139.00 (6.00)	140.00 (5.00)	140.00 (6.00)	0.0190*		
BUN	23.00 (27.38)	23.00(25.75)	24.00 (35.00)	25.00 (27.00)	0.0858		
CALCIUM	8.00 (0.90)	8.25 (0.87)	8.05(0.80)	8.20 (0.77)	0.0034*		
MAGNESIUM	2.00(0.40)	1.95(0.30)	2.00 (0.40)	1.90(0.40)	-0.0002		
WBC	11.30 (8.15)	10.70 (7.90)	$10.55\ (6.25)$	11.50(7.75)	0.0009		
LACTATE	2.15(2.23)	$1.80\ (0.90)$	1.60 (1.28)	1.73(1.03)	-0.0179		
ALT	46.50 (132.00)	29.50 (36.50)	55.00 (161.50)	40.00 (175.75)	7.8612		
AST	97.50 (200.00)	47.50 (75.25)	84.00 (184.00)	52.00 (162.75)	4.3695		
SBP	102.00 (12.00)	114.00 (14.00)	124.00 (17.00)	144.50 (20.00)	0.9804*		
DBP	57.00 (12.00)	58.00 (12.50)	56.00 (16.00)	58.00 (17.00)	-0.0153		
HR	95.25 (29.00)	86.00 (23.00)	83.00 (20.00)	80.00 (20.00)	-0.2705*		
RR	19.00 (7.00)	18.00 (5.50)	19.00 (6.00)	19.00 (5.00)	0.0067		
SPO2	97.00 (3.00)	98.00 (3.00)	98.00 (3.00)	98.00 (3.00)	0.0220*		
TEMP	98.34 (1.61)	98.20 (1.35)	98.25 (1.42)	98.20 (1.20)	-0.0022		
UO	1155.50 (1620.25)	1468.00 (1637.50)	1552.50 (1607.75)	1459.00 (1486.25)	3.2110		
PH	7.37 (0.11)	7.40 (0.08)	7.39 (0.09)	7.41 (0.08)	0.0022		
PAO2	94.50 (46.12)	99.00 (52.00)	108.50 (52.00)	100.00 (62.88)	0.1516		
HEMOG	10.20 (1.80)	10.40 (1.90)	10.17 (1.73)	10.40 (1.49)	0.0004		

Table 10: Characteristsics of GI Bleed patients (N = 1,214)

Pulse Pressure (Day 3)						
	[18, 52)	[52, 61.5)	[61.5, 74)	[74, 137]	Missing	
		N ((%)			
M	76 (9.5)	76 (9.5)	82 (10.3)	90 (11.3)		
F	109 (13.7)	113 (14.2)	107 (13.4)	104 (13.0)		
WHITE	7(0.9)	1(0.1)	7 (0.9)	5 (0.6)		
BLACK	23 (2.9)	10 (1.3)	18 (2.3)	22 (2.8)		
HISPANIC	7 (0.9)	2 (0.3)	4 (0.5)	3 (0.4)		
ASIAN	29 (3.6)	28 (3.5)	14 (1.8)	29 (3.6)		
OTHER	119 (14.9)	148 (18.5)	146 (18.3)	135 (16.9)		
0x VSP	122(15.3)	131 (16.4)	160 (20.1)	180 (22.6)		
1x VSP	30 (3.8)	34 (4.3)	19 (2.4)	13 (1.6)		
2x VSP	20 (2.5)	15 (1.9)	10 (1.3)	1 (0.1)		
3x VSP	12(1.5)	8 (1.0)	0 (0.0)	0(0.0)		
4x VSP	1 (0.1)	1 (0.1)	0(0.0)	0(0.0)		
VNT	1 (0.1)	12 (1.5)	6 (0.8)	1 (0.1)		
SD	66 (8.3)	72 (9.0)	46 (5.8)	40 (5.0)		
BB	36 (4.5)	42 (5.3)	52 (6.5)	67 (8.4)		
		Median		. ,		
WEIGHT	72.80 (31.00)	75.50 (25.20)	77.75 (27.22)	77.90 (27.90)	0.0459	
AGE	60.07 (20.81)	64.70 (22.84)	71.88 (20.36)	76.01 (14.91)	0.2495*	
ELIX28DPT	6.00 (9.00)	6.00 (8.00)	6.00 (10.00)	4.00 (9.00)	-0.0437*	
TCO2	23.00 (7.00)	24.00 (6.00)	25.00 (7.00)	24.00 (5.50)	0.0101	
CREATININE	1.08 (1.54)	1.08 (1.26)	0.90 (1.06)	1.15(1.05)	-0.0004	
POTASSIUM	3.90(0.60)	4.00 (0.66)	3.90(0.65)	3.90 (0.68)	-0.0015	
CHLORIDE	105.50 (8.00)	107.00 (7.00)	106.00 (7.75)	107.00 (8.00)	0.0174	
SODIUM	138.00 (7.00)	139.00 (6.62)	139.50 (5.38)	140.00 (6.00)	0.0182	
BUN	25.00 (31.12)	27.00 (30.00)	24.50 (23.50)	26.50 (34.25)	0.0365	
CALCIUM	8.00 (0.90)	8.10 (1.00)	8.10 (0.90)	8.20 (0.80)	0.0023	
MAGNESIUM	2.00(0.40)	2.00 (0.40)	2.00(0.32)	2.00 (0.40)	0.0001	
WBC	12.00(7.12)	10.90 (7.60)	11.38 (5.92)	10.70 (7.20)	-0.0114	
LACTATE	1.75(2.62)	1.65(0.91)	1.88 (1.45)	1.40 (1.80)	-0.0225*	
ALT	36.00 (61.00)	35.50 (68.50)	27.00 (111.00)	73.00 (530.50)	15.9631*	
AST	69.00 (114.50)	45.50 (76.75)	36.00 (159.50)	75.00 (369.00)	10.9267	
SBP	102.00 (15.50)	112.00 (13.50)	126.00 (17.50)	144.00 (17.75)	1.0092*	
DBP	57.50 (13.00)	56.00 (13.00)	59.00 (16.00)	58.50 (16.12)	0.0175	
HR	92.00 (24.50)	86.50 (23.50)	88.00 (17.50)	79.00 (18.50)	-0.2227*	
RR	19.00 (7.00)	19.00 (7.00)	19.50 (5.25)	19.00 (6.00)	-0.0030	
SPO2	97.00 (3.00)	97.50 (3.00)	97.00 (3.00)	97.00 (3.00)	0.0117*	
TEMP	98.30 (1.71)	98.35 (1.75)	98.60 (1.60)	98.20 (1.45)	-0.0007	
UO	1209.00 (1556.00)	1520.00 (2276.00)	1845.00 (2322.50)	1495.00 (1655.00)	7.3588	
PH	7.38 (0.10)	7.40 (0.08)	7.41 (0.09)	7.40 (0.08)	0.0003	
PAO2	92.00 (44.88)	102.00 (42.88)	97.50 (40.50)	110.00 (39.00)	0.2051	
HEMOG	10.30 (1.43)	10.40 (1.40)	10.37 (1.21)	10.25 (1.50)	-0.0007	

Table 11: Characteristsics of GI Bleed patients (N = 1,214)