

Tab. 1 Study characteristics of included studies

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
F.I. Albeladi, et al. 2017 [1]	General ICU	- Septic shock n=34 - cardiogenic shock n=20 - postoperative hypotension n=16 - trauma n=5	75 - AKI 21 - no AKI 54	17	N/A	50.7	51.6 (18-89)	APACHE II 24.6 (10-47) SOFA 9.8 (4-16)	- AKI 156.6 - no AKI 99.7 [μmol/L]	RIFLE - normal kidney function 33.3% - Risk 38.7% - Injury 24.0% - Failure 4.0% - Loss 0% - End-stage renal disease 0%	- ICU 21.3% - Hospital 53.3%
J. L. Alge, et al. 2013 [2]	Cardiac surgery	Patients after cardiac surgery	97	AKIN stage 1 n=0 AKIN stage 2 n=0 AKIN stage 3 n=9 (47%)	10 days	AKIN stage 1 n=42(71%) AKIN stage 2 n=14 (74%) AKIN stage 3 n=13 (68%)	AKIN stage 1 65.8±10,8 AKIN stage 2 64,5±10,0 AKIN stage 3 68,5±11,9	N/A	AKIN stage 1 1.7±0.4 AKIN stage 2 2.0±0.7 AKIN stage 3 2.5±0.8	AKIN stage 1 n=59 AKIN stage 2 n=19 AKIN stage 3 n=19	AKIN stage 2 n=2 (11%) AKIN stage 3 n=6 (32%)
S. M. Bagshaw, et al. 2010 [3]	ICU Patients with AKI and expected stay in ICU of ≥24h	AKI and - sepsis (cases; n=43) - no sepsis (controls; n=40)	83	n=13 (15,6%)	5 days	total 60.2% - sepsis 46% - no sepsis 54%	total 64.4 (±16.6) - sepsis 67.9 (±16.3) -no sepsis 60.6 (±16.3)	APACHE II - total 21.4 (±7.6) - sepsis 23.5 (±5.4) - no sepsis 19.2 (±8.9) SAPS II - sepsis 47.6 (±10.8) - no sepsis 35.4 (±18.3) SOFA - sepsis 8.2 (±3.1) - no sepsis 6.3 (±3.4)	- sepsis 142 (94-191) [μmol/L] - no sepsis 102 (84-136) [μmol/L]	RIFLE - RISK (%) -- sepsis 60.5 -- no sepsis 70 - INJURY (%) -- sepsis 23.3 -- no sepsis 17.5 - FAILURE (%) -- sepsis 16.3 -- no sepsis 12.5	Hospital death (%) - sepsis 44.2 - no sepsis 15.0

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
K. Cemil, et al. 2014 [4]	<i>Emergency Department</i>	Patients with uremic symptoms, divided into 2 groups: Group 1 (indications for emergency dialysis) Group 2 (no indic. for emerg. dialysis)	total: n=60 Group 1 n=30 Group 2 n=30	n=30 (Group 1)	N/A	Group 1 53.3% Group 2 0.4%	Group 1 68.29±16.9 Group 2 66.47±14.2	N/A	Group 1 7.37±5.6 Group 2 4.04±2.6	N/A	N/A
W. Chun, et al. 2017 [5]	<i>Patients with burn injuries</i>	Patients with > 20% TBSA burned	76 - Survivors n=54 - Non survivors n=22	- Survivors n=1 (1.9%) - Non survivors n=19 (86.4%)	N/A	- Survivors 87.0% - Non survivors 86.4%	- Survivors 46±13 - Non survivors 54±15	N/A	N/A	N/A	28.9%
J. M. Constantin, et al. 2010 [6]	<i>ICU</i>	patients admitted for medical/surgical reasons - total 1.44 - group 1 (NGAL <155 ng/mL) 1.39 - group 2 (NGAL >155 ng/mL) 1.5	total 88 - group 1 n=43 - group 2 n=45	total n=7 (8%) - group 1 n=0 - group 2 n=7 (15%)	'during ICU stay'	N/A	57(±16)	SAPS II - total 45±17 - group 1 39±14 - group 2 50±19 SOFA - total 7±3 - group 1 5±3 group 2 8±4	RIFLE 0-0: 0.83 ± 0.34; RIFLE 0-1: 0.81 ± 0.33; RIFLE 1-1: 3.6 ± 2.36; RIFLE 1-0: 1.36 ± 0.4;	RIFLE 0-0: 36 RIFLE 0-1: 20 RIFLE 1-1: 22 RIFLE 1-0: 10	Mortality in ICU - total 19% - group 1 9% - group 2 28%

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGOR/RIFLE	Mortality
D. N. Cruz, et al. 2009 [7]	ICU	<p><i>total</i></p> <ul style="list-style-type: none"> - medical 54.6% - elective surgery 8.3% - emergency surgery 37.1% <hr/> <p><i>no AKI</i></p> <ul style="list-style-type: none"> - medical 50.6% - elective surgery 8.3% - emergency surgery 41.1% <hr/> <p><i>AKI</i></p> <ul style="list-style-type: none"> - medical 59.4% - elective surgery 8.3% - emergency surgery 32.3% 	total n=301 - no AKI n=168 - AKI n=133	n=15 (5%)	during ICU stay	total 68.8% - no AKI 67.3% - AKI 70.7%	total 64 (45-74) - no AKI 58 (37-70.5) - AKI 69 (61-76.5)	<p>SAPS II</p> <ul style="list-style-type: none"> - total 41±15 - no AKI 38±15 - AKI 45±14 <p>APACHE II</p> <ul style="list-style-type: none"> - total 18±7 - no AKI 16±7 - AKI 20±7 <p>SOFA</p> <ul style="list-style-type: none"> - total 5 (5-7) - no AKI 5 (4-6) - AKI 5 (5-8) 	total 1.0 (0.8-1.4) - no AKI 0.9 (0.8-1.1) - AKI 1.3 (1.0-2.0)	RIFLE - Risk 30.6% - Injury 5.6% - Failure 8.0%	ICU mortality - total 17.3% - no AKI 8.9% - AKI 27.8%
H.R. de Geus, et al. 2011 [8]	ICU	700 consecutive general ICU patients. Diagnostic group: - Postoperativ 30,4% - Medical 21,9% - Neurologic 15,1% - Neurotrauma 4,8% - Multitrauma 5,9% - LTX 4,6% - Sepsis 6,8% - CPR 4,3% - Hemorrhagic shock 3% - MOF 3,3%	632 -Non-AKI (n=461) -RIFLE R (n=67) -RIFLE I (n=48) -RIFLE F (n=56)	RIFLE R: n=28	7 days	-Non-AKI 57% -RIFLE R 69% -RIFLE I 60% -RIFLE F 54%	-Non-AKI 58 (43,68) -RIFLE R 59 (45,70) -RIFLE I 61.5 (53,75) -RIFLE F 62 (50,68)	<p>APACHE II:</p> <ul style="list-style-type: none"> -Non-AKI 16 (13,22) -RIFLE R 19 (15,28) -RIFLE I 24 (20,29) -RIFLE F 25 (22,28) <p>SOFA score:</p> <ul style="list-style-type: none"> -Non-AKI 4 (2,6) -RIFLE R 7 (4,9) -RIFLE I 8 (6,11) -RIFLE F 11 (8,13) 	-Non-AKI 58 0.75 (0.61,0.91) -RIFLE R 1.10 (0.82,1.39) -RIFLE I 1.30 (0.82,1.64) -RIFLE F 2.09 (1.31,2.86)	-Non-AKI (n=461) -RIFLE R (n=67) -RIFLE I (n=48) -RIFLE F (n=56)	<p>ICU mortality:</p> <ul style="list-style-type: none"> -Non-AKI 8% -RIFLE R 15% -RIFLE I 19% -RIFLE F 46% <p>Hospital mortality:</p> <ul style="list-style-type: none"> -Non-AKI 11% -RIFLE R 30% -RIFLE I 33% -RIFLE F 54%

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
H. Dihazi, et al. 2016 [9]	<i>medical/anaesthesiologic ICU</i>	medical (myocardial infarction, sepsis, pneumonia...) and anaesthesiological (trauma...) patients	120 - dialysis 52 - non-dialysis 68	52	N/A	- dialysis 65 - non-dialysis 62	- dialysis 68.2 ± 2.1 - non-dialysis 70.3 ± 1.5	SAPS-II - dialysis 34 (9-72) - non-dialysis 28 (6-59)	- dialysis 2.9 ± 0.2 - non-dialysis 2.1 ± 0.1	AKIN - dialysis -- stage 1 n=0 -- stage 2 n= 0 -- stage 3 n=52 - non-dialysis -- stage 1 n=39 -- stage 2 n= 20 -- stage 3 n=9	N/A
M. Drey, et al. 2015 [10]	<i>ICU</i>	Patients with severe sepsis/septic shock presenting to an internal ICU	61	N/A	N/A	71%	67 (26-88)	APACHE II 24.3±7.8	2.0±1.4	N/A	N/A
J. Du, et al. 2013 [11]	<i>cardiac surgery patients</i>	cardiac surgery patients divided into 2 groups: - developed AKI after cardiac surgery [AKI-group] - not developed AKI [no AKI-group]	total 120 - no AKI 40 -AKI progressed -- no 41 -- yes 39	- no AKI 0 -AKI progressed -- no 0 -- yes n=6 (15%)	N/A	- no AKI 75% -AKI progressed -- no 76% -- yes 59%	- no AKI 59.9±10.1 -AKI progressed -- no 59.2±13.8 -- yes 61.2±13.3	N/A	- no AKI 1.1±0.3 -AKI progressed -- no 1.5±0.3 -- yes 1.6±0.4	BM measured @ AKIN Stage 1	30 day in-hospital mortality - no AKI 0 - AKI progressed -- no 0 -- yes n=7 (18%)
F. Dusse, et al. 2016 [12]	<i>cardiac surgery (TAVI)</i>	Patients with severe symptomatic aortic stenosis who underwent transapical/transaortic TAVI	total n=40 - KDIGO 2/3 n=8 - KDIGO 0/1 n=32	n=7	72 hours	- KDIGO 2/3 37.5% - KDIGO 0/1 40.6%	- KDIGO 2/3 81.4±4.2 - KDIGO 0/1 80.7±5.9	SAPS: - KDIGO 2/3 33.8±9.7 - KDIGO 0/1 27.0±6.7	- KDIGO 2/3 1.18±0.26 - KDIGO 0/1 1.12±0.24	KDIGO 0 n=25 KDIGO 1 n=7 KDIGO 2 n=2 KDIGO 3 n=6	30 day mortality (all cause) - KDIGO 2/3 12.5% - KDIGO 0/1 3.1%
Z. H. Endre, et al. 2011 [13]	<i>ICU</i> part of the EARLYARF randomized controlled trial of high-dose EPO in AKI	- Abdominal aortic aneurysm rupture and repair 4.5% - Abdom. surgery or inflammation 10.2%	528	n=19 (3.6%)	7 days	60.2%	60±17	APACHE II 18±6.4 SOFA score 6.3±2.8	N/A	AKIN on entry n=147 (27.8%) AKIN48 n=82 (15.5%) RIFLE24 n=19	10.2% (n=54) died within 7 days

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
		<ul style="list-style-type: none"> - Burns 0.9% - Cardiac arrest or failure 11.9% - Cardiac surgery 17.8% - Collapse, cause unknown 0.6% - Neurological 14.0% - Other 0.6% - Pulmonary/thoracic surgery or failure 12.1% - Sepsis 19.1% - Trauma 8.1% 								(3.6%)	
Z. H. Endre, et al. 2010 [14]	ICU EARLYARF randomized controlled trial of high-dose EPO in AKI	<p>EA1: Observation arm EA2: Treatment arm</p> <p>EA1:</p> <ul style="list-style-type: none"> - Abdominal aortic aneurysm 2.0% - Abdominal surgery/inflammation 7.5% - Burns 1.4% - Cardiac arrest/failure 8.1% - Cardiac surgery 19.7% - Collapse 0.9% - Neurological 17.7% - Pulmonary/thoracic surgery or failure 13.0% - Sepsis 19.1% - Trauma 9.9% - Other 0.6% <p>EA2:</p> <ul style="list-style-type: none"> - Abdominal aortic aneurysm 9.2% - Abdominal surgery/inflammation 15.2% - Burns 0% - Cardiac arrest/failure 19.0% - Cardiac surgery 14.1% - Collapse 0% 	EA1: 345 EA2: 183	EA1: 8 EA2: 11	7 days	EA1: 63.2% EA2: 54.6%	EA1: 60±18 EA2: 61±16	<p>APACHE II EA1: 17±6 EA2: 19±7</p> <p>SOFA score EA1: 6.1±2.7 EA2: 6.6±2.9</p>	EA1: 1.0 (0.79-1.4) EA2: 1.0 (0.79-1.3)	AKIN EA1: 26.7% EA2: 30.1%	EA1: 8.1% EA2: 14.2% (within 7 days)

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
		Neurological 7.1% - Pulmonary/thoracic surgery or failure 10.3% - Sepsis 19.0% - Trauma 4.9% - Other 0.5%									
A. Gaipov, et al. 2015 [15]	Cardiac surgery	Patients with elective coronary artery bypass grafting and/or cardiac valve surgery	total = 60 - Non-AKI n=20 - Nonprogressed AKI n=20 - Progressed AKI n=20	- Non AKI 0 - Nonprogressed AKI 0 - Progressed AKI 35% (7)	Max. 48h	total 70 (n=42) - Non-AKI 75 (n15) - Nonprogressed AKI 60 (n12) - Progressed AKI 75 (15)	- Non-AKI 51,8 (16,6) - Nonprogressed AKI 56,7 (15,1) - Progressed AKI 61,7 (9,6)	N/A	- NON-AKI 0.75 (±0.13) - Nonprogressed AKI 0.80 (±0.25) - Progressed AKI 0.98 (±0.34)	AKIN I n=34 AKIN II n=6	4 patients died
M. Garcia-Alvarez, et al. 2015 [16]	Cardiac surgery	patients undergoing cardiac surgery	- cardiac surgery associated-AKI (CSA-AKI)104 - No CSA-AKI 184	- CSA-AKI 21,2 (22) - No CSA-AKI 0 (0)	during ICU stay	- CSA-AKI 55,8 - No CSA-AKI 70,7	- CSA-AKI 75 (68-80) - No CSA-AKI 69 (59-76)	N/A	- CSA-AKI 94 (73-118) - No CSA-AKI 72 (64-87) µmol/L	N/A	ICU mortality - CSA-AKI 8.7% - No CSA-AKI 0.5% 28-day mortality - CSA-AKI 8.7% - No CSA-AKI 1.1% 365-day mortality - CSA-AKI 14.4% - No CSA-AKI 1.6%
N.J. Glassford et al. 2013 [17]	ICU Critically ill patients at risk of AKI	Admission diagnosis - Sepsis 20.59% - Stroke 7.85% - Malignancy 7.85% - Liver	102	7 (6.87%)	33.46 (7.37-224.24) hours	54.91%	66.55 (52.93-74.78)	APACHE II 66.55 (52.93-74.78)	82 (64.24-112) µmol/L	RIFLE - R n=54 - I n=28 - F n=4	ICU: 12 Hospital: 15

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
		failure/transplantation 8.83% - Post-cardiac surgery 16.67%									
I. Gocze, et al. 2015 [18]	<i>Surgical ICU</i>	Diagnosis/Surgery - Hepatobiliary 11% - Transplant 13% - Cancer 12% - Vascular 31% - Severe Trauma 20% - Sepsis 9% - Other 4%	107	n=10 9%	48 hours	N/A	60.03±14.78	SAPS II 22.13±9.63	1.13±0.60	- AKI 42% - AKI stage 2/3 22%	28-day mortality 9%
A. Haase-Fielitz, et al. 2009 [19]	<i>Cardiac surgery</i>	Patients with cardiac surgery necessitating the use of cardiopulmonary bypass	100	4	7 days	61	69.5±8.7	EuroScore: No pre-operative renal impairment: - AKI 6.5±2.3 - no AKI 5.0±2.1 Pre-operative renal impairment: - AKI 7.7±2.1 - no AKI 5.8±2.3	90.8±25.7 (preoperative, µmol/L)	RIFLE - R n=31 - I n=13 - F n=6 - I+F n=19	2 hospital deaths
A. Haase-Fielitz, et al. 2011 [20]	<i>Cardiac surgery</i>	Patients enrolled into the control arm of the sodium bicarbonate in cardiac surgery study	Total 100 - AKI 9 - no AKI 91	- AKI n=3 - no AKI n=2	7 days	- AKI 77.8% - no AKI 65.9%	- AKI 74 (70-77) - no AKI 67 (56-73)	N/A	- AKI 0.92 (0.51-1.83) - No AKI 1.14 (0.57-1.74) (baseline)	RIFLE - R n=4 - I n=3 - F n=2	hospital mortality - AKI n=3 (33.3%) - no AKI n=0 (0%)
R. Haines, et al. 2017 [21]	<i>ICU</i>	Patients admitted to ICU for non-cardiac reasons.	Total 138 - AKI 73 - no AKI 65	40	N/A ("The median time between the day of admission to the ICU and the day of the worst AKI stage was 3 days.	Total 58.0% - AKI 53.4% - no AKI 63.1%	Total 65.5 (49-76) - AKI 69 (54-77) - no AKI 61 (41-72)	APACHE II Total 19.4 (SD 6.4) - AKI 22.2 (5.9) - no AKI 16.2 (5.1) SOFA Total 7.5 (SD 3.7) - AKI 8.9 (3.8) - no AKI 6.0 (3.0)	N/A	KDIGO (AKI:) - stage 1 10.1% - stage 2 10.1% - stage 3 w/o dialysis 3.6% - stage 3 w dialysis 20.3%	N/A

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
J. Hanson, et al. 2011 [22]	<i>Malaria patients</i>	Patients enrolled in clinical trials of adjuvant therapy of severe malaria	163	43 should have received RRT, for logistic reasons only 19 received RRT	Max 7 days	80	35 (23 - 45)	N/A	122 (79.6-202) (μmol/L)	N/A	Patients with RRT 37% mortality rate Patients unable to receive RRT 75%
S. Herget-Rosenthal, et al. 2004 [23]	<i>Surgical/medical ICU</i>	All patients in ICU regarded as high-risk patients for ARF Primary diagnosis: ARF - Acute leukemia/lymphoma 7% - Cardiovascular disease 43% - Hepatic failure 16% - Respiratory failure 11% - Sepsis 16% - Shock 5% - Other 2% Control - Acute leukemia/lymphoma 12% - Cardiovascular disease 53% - Hepatic failure 15% - Respiratory failure 5% - Sepsis 10% - Shock 0% - Other 5%	Total 85 - ARF 44 - Control 41	17	N/A	- ARF 51,7 - Control 64	- ARF 70 ± 8 - Control 63 ± 11	N/A	- ARF 139±18 - Control 79±17 mg/L	RIFLE - R n=44 - I n=41 - F n=28	N/A

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
S. Herget-Rosenthal, Poppen, et al. 2004 [24]	ICU/hospitalized patients with potential ARF reporting to Department of Nephrology	ICU/hospitalized patients Etiology of ATN: Patients receiving RRT (RRT+) - Ischemia n=3 (11%) - Nephrotoxicity n=2 (8%) - Sepsis/SIRS n=7 (27%) - Combination n=14 (54%) Patients not receiving RRT (RRT-) - Ischemia n=15 (32%) - Nephrotoxicity n=13 (28%) - Sepsis/SIRS n=12 (26%) - Combination n=7 (14%)	RRT+ n=26 RRT- n=47	26	Median 4 (2-6) days	RRT+ n=17 (65%) RRT- n=30 (63%)	RRT+ 67(50-73) RRT- 70 (57-74)	N/A	RRT+ 194 (177-221) (μmol/L) RRT- 159 (142-213) (μmol/L)	N/A	RRT+ 85% RRT- 13%
P. B. Hjortrup, et al. 2015 [25]	ICU Sub-study of the Scandinavian Starch for Severe Sepsis and Septic Shock (6S) trial	- Patients enrolled into the 6S trial; sample collection at inclusion - Septic Patients	222	40 (18%)	during ICU stay	57	66 (57-75)	SAPS II 54 (39-66) SOFA score (ex. GCS score) 8 (6-10)	101 (66-185) μmol/L	KDIGO - Stage 1 n=19 (15%) - Stage 2 n=5 (4%) - Stage 3 n=7 (5%)	ICU mortality 39% 90-day mortality 55%
P.W. Ho, et al. 2017 [26]	General hospital population	Patients admitted to hospital with AKI	107 - AKI 59 - acute-on-chronic renal failure (AOCRF) 48	27 (25.2%)	N/A	- AKI 57.6% - AOCRF 50%	- AKI 53.2±17.1 - AOCRF 68.7±10.7	N/A	- AKI 91.1±19.3 - AOCRF 243.6±132.9	N/A	"12 patients [...] died within 90 days"

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
Q. Hu, et al. 2017 [27]	<i>Surgical ICU</i>	Surgical critically ill patients	Total 125 - AKI 52 - no AKI 73	Total n=18 - AKI n=18 - no AKI n=0	N/A	Total 78.4% - AKI 72.6% - no AKI 80.8%	Total 51.5±14.8 - AKI 52.6±13.4 - no AKI 50.8±15.8	APACHE II Total 8.8±5.3 - AKI 10.8±6.3 - no AKI 7.4±4.0 SOFA Total 5.1±3.8 - AKI 6.6±4.4 - no AKI 4.0±2.6	Total 92.0 (59.5-149.5) - AKI 163.5 (81.3–287.7) - no AKI 72.0 (55.5–105.0)	N/A	Hospital: Total 11.2% - AKI 19.2% - no AKI 5.5%
T.S. Itenov, et al. 2016 [28]	<i>ICU Sub-study of the PASS-trial</i>	ICU population, severe sepsis/septic shock in 30.6%.	454	39	28 days	60.1	68 (60-76)	APACHE II 18 (23-24)	112 (72-194) μmol/L	N/A	N/A
V. Jalkanen, et al. 2013 [29]	<i>ICU Sub-study of the FINNALI study</i>	Patients admitted to ICU and receiving ventilator support for more than 6h	454	N/A	N/A	68,5	64 [53–74]	SAPS 41 (29-53) SOFA score 8 (6-10)	N/A	N/A	90-day mortality 26.2% 12-month mortality 31.5%
A. H. Kiessling, et al. 2014 [30]	<i>Cardiac surgery Post-hoc analysis of the 'Comparison of Two Different Heart-lung Machine Filling Methods: Precoating Versus Colloidal Fluids' trial</i>	Patients with elective on-pump cardiac-surgery procedures	total 70 - No AKI 40 - AKI 6	8	0-4 days	total 77 - No AKI 64% - AKI 75%	total 74 ± 9 - No AKI 72.6±10.1 - AKI 80±3.7	N/A	- No AKI 1.09±0.3 - AKI 1.6±0.84	AKIN 1 n=21	30d Mortality - No AKI 6.4% - AKI 25%
H. Kim et al. 2017 [31]	<i>Septic patients</i>	Patients with sepsis	167	24	N/A	59.3	70 (57-77)	N/A	N/A	N/A	30-day mortality 18%

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
J. L. Koyner, et al. 2015 [32]	ICU Patients from the SAKInet cohort having received a Furosemide Stress Test.	Critically ill patients with AKIN 1 or 2, who were part of the SAKInet cohort and were identified as having received an FST.	Entire Cohort n=77 - Nonprogressors n=52 - AKIN Stage 3 Progressors n=25	14.2% (11)		42.8	65.3±1.6	APACHE II: - Entire Cohort 17.8±1.11 - Nonprogressors 16.5±1.2 - AKIN 3 Progressors 21.6±2.5 SOFA score: - Entire Cohort 1.16±0.03 - Nonprogressors 1.05±0.2 - AKIN 3 Progressors 1.5±0.4	N/A	AKIN: Entire Cohort - Stage 1 n=51 (53.2%) - Stage 2 n=36 (46.7) Nonprogressors - Stage 1 n=34 (65.4%) - Stage 2 n=18 (34.6%) AKIN 3 Progressors - Stage 1 n=7 (28.0%) - Stage 2 n=18 (72.0%)	'Death' -Entire Cohort 20.7% - Nonprogressors 13.4% - AKIN Stage 3 Progressors 36.0%
M. J. Koziolek, et al. 2012 [33]	ICU (medical & anesthesiological)	ICU patients with deterioration of kidney function were included.	total 120 - dialysis 52 - non-dialysis 68	52	„Range for dialysis prediction : 0-24 days“	- dialysis 65 - non-dialysis 62	- dialysis 68.2±2.1 - non-dialysis 70.3±1.5	SAPS II - dialysis 34 (9-72) - non-dialysis 28 (6-58)	- dialysis 2.9±0.2 - non-dialysis 2.1±0.1	AKIN score - dialysis -- AKIN 1 n=0 -- AKIN 2 n=0 -- AKIN 3 n=52 - non-dialysis -- AKIN 1 n=39 -- AKIN 2 n=20 -- AKIN 3 n=9	N/A
R. Linko, et al. 2013 [34]	ICU Sub-study of the FINNALI study	Patients admitted to ICU and receiving ventilator support for more than 6h.	3690	47	N/A	66	61 (51-73)	- SAPS II 44 (32-56) - SOFA score 8 (6-10)	80 (62-122) µmol/L	N/A	- Hospital mortality 23% - 90-day mortality 30%
A. Lukasz, et al. 2014 [35]	ICU	Patients diagnosed with hemolytic-uraemic syndrome.	39	24	5 (4.8-8.8) days	28	45 (35-57)	N/A	202 (120-343) µmol/L	- AKIN I n=7 - AKIN II n=8 - AKIN III n=16	Mortality n=1
M. Mahdavi-Mazdeh, et al. 2012 [36]	Renal transplantation	Renal allograft recipients	33	6	7 days	48	36.3±12.2 (14–58)	N/A	- delayed graft function 7.3±1.0 - slow graft function 5.5±1.9 - immediate graft function 7.2±1.5	N/A	N/A

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
A. S. Maisel, et al. 2016 [37]	<i>Emergency department/hospital</i> AKINESIS trial	Patients presenting to hospital with signs and symptoms of acute heart failure, with planned admission and treatment with diuretic agents.	927	11	5 days	62	68.5	N/A	1.19 (0.94-1.6)	N/A	hospital mortality 3.1%
J. Mårtensson, et al. 2017 [38]	<i>ICU</i> FINNAKI study	16 mixed ICUs, 1 cardiac-surgical ICU	Total 1112 - early AKI n=223 - late AKI n=199 - no AKI n=690	- early AKI n=69 - late AKI n=26 - no AKI n=0	N/A	- early AKI 71.3 - late AKI 63.8 - no AKI 61.4	- early AKI 65 (54-74) - late AKI 66 (54-75) - no AKI 62 (47-72)	SAPS II - early AKI 39 (30-52) - late AKI 45 (36-60) - no AKI 32 (25-43)	- early AKI 76 (60-94) - late AKI 79 (65-100) - no AKI 72 (59-88) μmol/L	KDIGO - early AKI -- Stage 1 n=189 -- Stage 2 n=88 -- Stage 3 n=145	N/A
D. R. McIlroy, et al. 2015 [39]	<i>Cardiac surgery</i>	Patients undergoing cardiac surgery, all types of cardiac surgery were included <hr/> Outcome + → primary outcome, composite of hospital mortality or initiation of renal replacement therapy	603 outcome - 578 outcome + 25	14	4 (2-6) days	- outcome - 63,5 (367) - outcome + 52,0 (13)	- outcome - 65(16) - outcome + 67(14)	N/A	N/A	KDIGO Stage 1 - Outcome - n=108 - Outcome + n=21 Stage 2 - Outcome - n=18 - Outcome + n=2 Stage 3 - Outcome - n=8 - Outcome + n=13	N/A
M. Nejat, et al. 2010 [40]	<i>ICU</i> Not interventional arm of the EARLYARF trial.	Consecutive patients admitted to the ICU.	444	14	30 days	61	60±18	APACHE II 17.7±6.3 SOFA score 6.2±2.7	90 (70-120) μmol/L	N/A	30-day mortality 14.4%

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
S. Nisula, et al. 2014 [41]	ICU FINNAKI study	Admission type - Emergency 912 - Surgical 362 Diagnostic group - Cardiovascular, operative 160 - Cardiovascular, nonoperative 154 Respiratory tract, nonoperative 121 - Gastrointestinal tract, operative 95 - Metabolic 94 - Neurological, nonoperative 76 - Sepsis 67 - Trauma 63 Gastrointestinal tract, nonoperative 59 - Other 153	1042	83	3 days	64.6	63.0 (51.0-73.0)	SAPS II 36 (27-48) SOFA score 8 (5-10)	79 (59.3-119.8) μmol/L	KDIGO - Stage 1 n=168 - Stage 2 n=81 - Stage 3 n=130	90-day mortality 21.6%
S. Nisula, et al. 2015 [42]	ICU Sub-study to the FINNAKI study	Admission type - Emergency 1286 - Surgical 485 Diagnostic group - Cardiovascular, operative 182 - Cardiovascular, nonoperative 189 Respiratory tract, nonoperative 178 - Gastrointestinal tract, operative 135 - Metabolic 139 - Neurological, nonoperative 133 - Sepsis 89 - Trauma 99 Gastrointestinal tract, nonoperative 92 - Other 203	1439	96	3 days	63.9	63 (50-73)	SAPS II - All 36 (27-47) - AKI 42 (33-56) - No AKI 32 (25-43) SOFA score - All 7 (5-10) - AKI 9 (7-12) - No AKI 6 (4-8)	N/A	N/A	90-day mortality 31%
E.D. O'Sullivan, et al. 2017 [43]	High dependency unit and ITU	"retrospective cohort analysis of all acute admissions to a district general hospital medical high dependency	107	16	N/A	49.5	60 (19.2)	N/A	N/A	AKIN - Stage 1 17.8% - Stage 2 3.7% - Stage 3 1%	30%

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
		unit and ITU									
M. Y. Park, et al. 2013 [44]	General hospital population	Patients admitted to hospital with potential AKI who reported to the Department of Nephrology	Total 213 - Prerenal AKI n=86 - Intrinsic AKI n=127	- Prerenal AKI n=0 - Intrinsic AKI n=35	'during treatment period'	- Prerenal AKI 53.5 - Intrinsic AKI 46.5	- Prerenal AKI 64±18 - Intrinsic AKI 65±17	APACHE II - Survival 21 (19-25) - Dead 30 (23-32)	- Prerenal AK 1.9 (16-25 [sic]) - Intrinsic A 2.3 (1.8-3.5)	AKIN - Stage 1 n=39 - Stage 2 n=37 - Stage 3 n=51	- Prerenal AKI 0% - Intrinsic AKI 26.8%
T. J. Pianta, et al. 2015 [45]	Renal transplantation	Patient group from 'Clusterin in kidney transplantation: novel biomarkers versus serum creatinine for early prediction of delayed graft function.' study.	Total 56 - DGF [delayed graft function] n=22 - non-DGF n=34	22	7 days	- DGF 68 - non-DGF 64	- DGF 50 (47-62) - non-DGF 56 (49-62)	N/A	N/A	N/A	Death n= 29 (=51.8%)
J. W. Pickering, et al. 2013 [46]	ICU	Stored samples from the Early-ARF trial population.	528	45	30 days	60.9	60±17	N/A	N/A	N/A	Death n=53
J. W. Pickering, et al. 2012 [47]	ICU Patients from both observation and intervention arms from EARLYARF trial (high-dose EPO in AKI).	- Abdominal aortic aneurysm rupture & repair 5 (22) - Abdominal surgery or inflammation 11 (51) - Burns 1 (5) - Cardiac arrest or failure 13 (63) - Cardiac surgery 13 (64) - Collapse, cause unknown 1 (3) - Neurological surgery, injury or seizure or hemorrhage 15 (71) - Other 1 (3) - Pulmonary or thoracic surgery or failure 13 (63) - Sepsis 20 (97) - Trauma 9 (42)	484	N/A	30 days	61	60±17	APACHE II: 18±6 SOFA Score: 6.3±2.8	1.0 (0.79-1.36)	N/A	N/A (only combined endpoint: dialysis/death)
K. Plewes, et al. 2017 [48]	General ward/ICU	Patients suffering from malaria (P. falciparum)	107 (+ 80 patients with uncomplicated malaria + 28 with sepsis as control groups)	Total n=32 - AKI n=29 - no AKI n=3	N/A	Total 70 - AKI 65 - no AKI 78	Total 30 (22-40) - AKI 27 (18-40) - no AKI 30 (25-45)	N/A	Total 1.4 (1.1-1.3) - AKI 3.0 (1.6-4.4) - no AKI 1.2 (1.0-1.3)	KDIGO - stage 1 26% - stage 2 26% - stage 3 48%	Total 33% - AKI 40% - no AKI 22%

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
C. Pipili, et al. 2014 [49]	ICU Mechanically ventilated patients admitted to the ICU.	Patient type (Cohort): - Medical 47% - Elective surgery 20% - Emergency surgery 33% Admission diagnosis (Cohort): - Neurologic 14% - Respiratory 25% - Polytrauma 5% - Neurotrauma 16% - Gastrointestinal 20% - Septic 8%	106	50	within 10 days of ICU admission	64.2	64±18	APACHE II: - Cohort 19±8 - RRT 20±5.5 - non-RRT 17.5±9 SOFA score - Cohort 3±3 - RRT 9.6±2.6 - non-RRT 8.5±3.5	- Cohort: 0.97(1.25) - RRT: 1.61 (1.64) - non-RRT 0.8 (0.4)	RIFLE (ICU admission) <i>Cohort:</i> - R n=9 - I n=9 - F n=3 <i>RRT:</i> - R n=9 - I n=8 - F n=2 <i>non-RRT</i> - R n=0 - I n=1 - F n=1	ICU mortality: - Cohort: 56% - RRT: 84% - non-RRT 30%
A. M. Ralib, et al. 2012 [50]	ICU Patients admitted to the general ICU or high-risk patients scheduled for cardiothoracic surgery with CPB.	Primary diagnosis class: - abdominal aortic aneurysm rupture/repair 4.5% - abdominal surgery/inflammation 10.5% - burns 1.0% - cardiac arrest/failure 13.0% - cardiac surgery 13.2% - collapse 0.6% - neurologic 14.7% - respiratory failure/thoracic surgery 13.0% - sepsis 20.0% - trauma 8.7% - other 0.6%	484	12	7 days	60.7	60±17	APACHE II: 18±6 SOFA score 6.3±2.8	72 (60-90) µmol/L	AKIN - stage 1 n=112 - stage 2 n=25 - stage 3 n=8	7 days 10.1% 365 days 24.6%
L. Renhua, et al. 2014 [51]	General hospital population	Patients with AKI at the time of nephrology consultation	103	48	2.17 (0.3) days	65	54.28±19.05	N/A	383.58±251.58 µmol/L	AKIN - stage 1 17.5% - stage 2 27.2% - stage 3 55.3%	28-day mortality 25.2%
O. Rewa, et al. 2015 [52]	ICU Adults admitted to ICU with evidence of	Admission diagnosis - Postoperative 19% - Medical 81%	227	24	30 days	62	65±14	SOFA score 10 (8-14)	160 (118-228.5) µmol/L	Modified KDIGO - no AKI n=54 - Class I n=78	30- day mortality 37% 90-day

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
	abnormal kidney function.	(Sepsis 18%)								- Class II n=54 - Class III n=41	mortality 44%
A. A. Royakkers, et al. 2012 [53]	ICU Critically ill patients with mechanical ventilation ≥48 hours and/or length of ICU stay ≥72 hours.	<p>Primary diagnosis:</p> <ul style="list-style-type: none"> -Patients who never developed AKI -- CPB 1.7% -- cardiovascular failure 1.7% -- cerebrovascular event 3.5% -- hemorrhagic shock 12.3% -- multiple trauma 5.3% -- elective major surgery 1.8% -- respiratory failure 38.6% -- septic shock 35.1% <hr/> <ul style="list-style-type: none"> - Patients who developed AKI -- CPB 6.4% -- cardiovascular failure 12.9% -- cerebrovascular event 0% -- hemorrhagic shock 3.2% -- multiple trauma 6.4% -- elective major surgery 3.2% -- respiratory failure 32.2% -- septic shock 35.5% <hr/> <ul style="list-style-type: none"> - Patients with AKI on admission -- CPB - -- cardiovascular failure 7.7% -- cerebrovascular event 0% -- hemorrhagic shock 9.6% -- multiple trauma 1.9% 	Total 140 - Patients who never developed AKI 57 - Patients who developed AKI 31 - Patients with AKI on admission 52	11	N/A	<ul style="list-style-type: none"> - Patients who never developed AKI 64.9 - Patients who developed AKI 67.7 - Patients with AKI on admission 61.5 	<ul style="list-style-type: none"> - Patients who never developed AKI 58.8 (16.1) - Patients who developed AKI 67.1 (15.8) - Patients with AKI on admission 74.4 (9.4) 	<p>APACHE II:</p> <ul style="list-style-type: none"> - Patients who never developed AKI 18.5 (9.4) - Patients who developed AKI 19.3 (8.3) - Patients with AKI on admission 23 (11.5) <hr/> <p>SAPS II:</p> <ul style="list-style-type: none"> - Patients who never developed AKI 35.9 (12) - Patients who developed AKI 42.8 (15) - Patients with AKI on admission 47.1 (14.8) 	<ul style="list-style-type: none"> - Patients who never developed AKI 62 (50-78) - Patients who developed AKI 86 (72-104) - Patients with AKI on admission 110 (73-177) μmol/L 	<p>worst AKI score in ICU:</p> <ul style="list-style-type: none"> - Patients who never developed AKI - - Patients who developed AKI -- Risk n=25 -- Failure n=2 - Patients with AKI on admission -- Risk n=22 -- Injury n=13 -- Failure n=17 	<p>ICU mortality:</p> <ul style="list-style-type: none"> - Patients who never developed AKI 0% - Patients who developed AKI 13% - Patients with AKI on admission 15% <hr/> <p>Hospital mortality:</p> <ul style="list-style-type: none"> - Patients who never developed AKI 7.0% - Patients who developed AKI 16.1% - Patients with AKI on admission 29%

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGOR/RIFLE	Mortality
		-- elective major surgery 9.6% -- respiratory failure 26.9% -- septic shock 46.2%									
A. A. Royakkers, et al. 2011 [54]	ICU Critically ill patients with mechanical ventilation ≥ 48 hours and/or length of ICU stay ≥ 72 hours.	<p>Primary diagnosis:</p> <ul style="list-style-type: none"> -Patients who never developed AKI -- cardiovascular failure 3.3% -- cerebrovascular event 3.3% -- hemorrhagic shock 11.7% -- multiple trauma 6.7% -- elective major surgery 1.7% -- respiratory failure 38.3% -- septic shock 33.3% <hr/> <ul style="list-style-type: none"> - Patients who developed AKI -- cardiovascular failure 11.4% -- cerebrovascular event 0% -- hemorrhagic shock 5.7% -- multiple trauma 5.7% -- elective major surgery 2.9% -- respiratory failure 31.4% -- septic shock 37.1% <hr/> <ul style="list-style-type: none"> - Patients with AKI on admission -- cardiovascular failure 7.1% -- cerebrovascular event 0% -- hemorrhagic 	Total 151 - Patients who never developed AKI 60 - Patients who developed AKI 35 - Patients with AKI on admission 56	14	4 days	- Patients who never developed AKI 65 - Patients who developed AKI 69 - Patients with AKI on admission 62	- Patients who never developed AKI 59.2 \pm 16.1 - Patients who developed AKI 68.4 \pm 15.4 - Patients with AKI on admission 74.6 \pm 9.3	<p>APACHE II:</p> <ul style="list-style-type: none"> - Patients who never developed AKI 18.5\pm9.9 - Patients who developed AKI 19.6\pm8.3 - Patients with AKI on admission 24.2\pm12.9 <hr/> <p>SAPS II:</p> <ul style="list-style-type: none"> - Patients who never developed AKI 37.2\pm13.3 - Patients who developed AKI 44.1\pm14.2 - Patients with AKI on admission 47.6\pm16.4 	- Patients who never developed AKI 72 (61-94) - Patients who developed AKI 87 (76-87) - Patients with AKI on admission 139 (97-211)	<p>Max. RIFLE class</p> <ul style="list-style-type: none"> - Patients who never developed AKI - - Patients who developed AKI -- Risk n=27 -- Injury n=5 -- Failure n=3 - Patients with AKI on admission -- Risk n=22 -- Injury n=14 -- Failure n=20 	<p>ICU mortality:</p> <ul style="list-style-type: none"> - Patients who never developed AKI 0% - Patients who developed AKI 11.4% - Patients with AKI on admission 19.6% <hr/> <p>Hospital mortality:</p> <ul style="list-style-type: none"> - Patients who never developed AKI 6.7% - Patients who developed AKI 17.1% - Patients with AKI on admission 32.1%

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
		shock 10.7% -- multiple trauma 1.8% -- elective major surgery 8.9% -- respiratory failure 25% -- septic shock 46.6%									
H. P. Shum, et al. 2015 [55]	ICU	Emergency operation: - Total 65.6% - AKI 75.6% - No AKI 61.3% Type of operation: - Total: -- Abdominal 56.3% -- Neurosurgery 24.5% -- Vascular 7.3% -- Orthopedics 6.6% -- Others 5.3% - AKI: -- Abdominal 64.6% -- Neurosurgery 15.6% -- Vascular 8.8% -- Orthopedics 11.1% -- Others 0% - No AKI: -- Abdominal 53.8% -- Neurosurgery 28.3% -- Vascular 6.6% -- Orthopedics 4.7% -- Others 6.8%	Total 151 - AKI 45 - No AKI 106	Total n=7 - AKI n=7 - No AKI n=0	N/A	Total 57 - AKI 60 - No AKI 56	Total 65 (55-80) - AKI 74 (60-83) - No AKI 64 (54-78)	APACHE IV - Total 60 (47-79) - AKI 75 (62-93) - no AKI 54 (43-71)	Total 72 (60-96) - AKI 101 (72-133) - No AKI 67 (59-79) μmol/L	AKIN - AKI: -- Stage 1 n=22 -- Stage 2 n=14 -- Stage 3 n=9	ICU mortality: -Total 3.3% - AKI 11.1% - No AKI 0% Hospital mortality: -Total 10.6% - AKI 24.4% - No AKI 4.7%

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGOR/RIFLE	Mortality
E. D. Siew, et al. 2010 [56]	ICU First 588 patients enrolled in the VALID study.	ICU type: <i>Medical</i> - No AKI 151 (49%) - AKI 47 (55%) <i>Surgical</i> - No AKI 54 (18%) - AKI 29 (34%) <i>Trauma</i> - No AKI 92 (30%) - AKI 7 (8%) <i>Cardiac</i> - No AKI 8 (3%) - AKI 3 (3%)	Total 391 - AKI 86 - No AKI 305	21.99 (86)	28 days	AKI: 65 No AKI: 56	AKI: 55 [43-68] No AKI: 52 [37-63]	APACHE II: - AKI 30 (23-34) - No AKI 22 (18-28) modAPACHE II: - AKI 26 (20-31) - no AKI 21 (17-26) SAPS II: - AKI 57 (41-69) - No AKI 44 (32-55)	AKI 1.5 (1.0-2.2) No AKI 0.9 (0.7-1.2)	AKIN - AKI: -- Stage 1 n=61 -- Stage 2 n=7 -- Stage 3 n=18	28-day mortality n=101
E. D. Siew, et al. 2013 [57]	ICU Patients from the Validation of biomarkers for Acute Lung Injury Diagnosis (VALID) study.	<i>Surgical ICU</i> - AKI 36 (28%) - No AKI 45 (18%) <i>Medical ICU</i> - AKI 52 (41%) - No AKI 79 (32%) <i>Trauma ICU</i> - AKI 35 (28%) - No AKI 118 (48%) <i>Cardiac ICU</i> - AKI 4 (3%) - No AKI 3 (1%)	Total: 372 - AKI: 127 - No AKI: 245	34.14 (127)	28 days	AKI: 69 No AKI: 74	AKI: 49 (40-63) No AKI: 51 (36-61)	Modified APACHE II: - AKI 24 (19-27) - No AKI 22 (18-27) SAPS II: - AKI 49 (37-58) - No AKI 49 (37-58)	AKI 0.90 (0.74-1.15) No AKI 0.91 (0.70-1.08)	AKIN - AKI: -- Stage 1 n=93 -- Stage 2 n=18 -- Stage 3 n=16	'Died' - AKI 31% - No AKI 11% 28-day mortality n=38
D.L. Skinner, et al. 2017 [58]	Crush injuries	Patients with crush injuries secondary to sjambok injuries (retrospective analysis of a local trauma database)	310	12	N/A	83.3	27±9.8	N/A	83 (70-110) µmol/L	KDIGO - no AKI n=264 - Stage 1 n=18 - Stage 2+3 n=28	1.9%
N. Srisawat, et al. 2011 [59]	Emergency department Post hoc analysis of the GenIMS (Genetic and Inflammatory Markers of Sepsis) study.	GenIMS: Patients with community-acquired pneumonia presenting to the emergency department. Subset of 189 patients who met the RIFLE-F criteria.	Total 181 - Recovery 93 - Non-recovery 88	- Recovery 0 - Non-recovery 14	N/A	- Recovery 51.6 - Non-recovery 60.2	- Recovery 67.9 (±15.6) - Non-recovery 72.9 (±14.9)	APACHE III - Recovery 48.4±16.4 - Non-recovery 52.4±18 SAPS II - Recovery 4.35±2.91 - Non-recovery 5.45±3.56	- Recovery 1.75 (±1.87) - Non-recovery 3.14 (±2.8)	RIFLE-F n=181	Hospital: - Recovery 0% - Non-recovery 48.9% 30-day - Recovery 4.3% - Non-recovery 47.7% 60-day - Recovery 9.7% - Non-recovery

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
											55.7% 90-day - Recovery 12.9% - Non-recovery 55.7%
M. Sumida, et al. 2014 [60]	Cardiac surgery	Patients after cardiac surgery	Total 31 - Non-AKI 14 - AKI-without RRT 11 - AKI with RRT 6	6	N/A	- Non-AKI 86 - AKI-without-RRT 82 - AKI-with-RRT 67	- Non-AKI 39 [32-51] - AKI-without-RRT 41 [36-50] - AKI-with-RRT 48 [34-62]	N/A	- Non-AKI 0.91 (0.73-10.8) - AKI-without-RRT 1.39 (0.62-1.87) - AKI-with-RRT 1.75 (0.85-2.19)	N/A	28-day mortality - Non-AKI 0% - AKI-without-RRT 0% - AKI-with-RRT 17% Total mortality - Non-AKI 7% - AKI-without-RRT 9% - AKI-with-RRT 67%
P. Susantitaphong, et al. 2012 [61]	Acute care facilities	Hospitalized patients with AKI who received in-hospital nephrology consultation for AKI. Cause of AKI - Patients with Risk-allele (allele I or G) -- Ischemic 21% -- Nephrotoxic 19% -- Sepsis 14% -- Multifactorial/other 46% - Patients w/o risk allele (other alleles) -- Ischemic 31% -- Nephrotoxic 13% -- Sepsis 7% -- Multifactorial/other 49%	- AKI patients n=241 - Healthy non-hospitalized controls n=267	- AKI: 92	N/A	- AKI 54 - Controls 26	- AKI 64.5±15.9 - Controls 41.5±16.5	APACHE II - Patients with Risk-allele (allele I or G) 19.7±6.8 - Patients w/o risk allele (other alleles) 20.0±6.4		AKIN - AKI: -- Stage 1 n=66 -- Stage 2 n=12 -- Stage 3 n=136	- AKI: 24%
K. Tiranathanagul, et al. 2013 [62]	ICU Critically ill patients with AKI stage 2/3 (AKIN criteria).	Primary diagnosis N/A - Sepsis -- Non-RRT n=16 -- RRT n=17 - Shock -- Non-RRT n=11	47	18	3 days	- Non-RRT 62 - RRT 72	- Non-RRT 63.8±19.4 - RRT 62.0±16.3	APACHE II - Non-RRT 14.5±5.1 - RRT 25.6±6.1 SOFA score - Non-RRT	- Non-RRT 0.94±0.32 - RRT 1.27±0.69	N/A	Hospital death 40%

Author, Year	Setting	Patient type	No. of Patients	No. of Pat. receiving RRT	Initiation of RRT within	% male	Age (years)	Illness severity Scores	blood Cr (mg/dl)	AKIN/KDIGO/RIFLE	Mortality
		-- RRT n=14						7.1±3.2 - RRT 13.0±3.44			
X. Valette, et al. 2013 [63]	ICU/Contrast-induced AKI (CI-AKI) All adult patients with expected ICU stay ≥48 hours and underwent imaging with CM administration.	Admission diagnosis - Medical 43% -- Acute respiratory failure 23% -- Coma 5% -- Acute pancreatitis 5% -- Cardiac arrest 4% -- Shock 3% Miscellaneous 2% - Emergency surgery 43% -- Neurosurgery 24% -- Abdominal surgery 11% -- Vascular surgery 4% -- Miscellaneous 3% - Major trauma 11%	98	6	6 (3-14) days after CM injection	75	60 (47-67)	SAPS II 40 (32-51) SOFA score 8 (5-11)	- No CI-AKI (n=68) 0.65 (0.47-0.81) - CI-AKI (n=30) 0.85 (0.61-1.26)	RIFLE - R n=17 - I n=20 - F n=4	ICU mortality 13%

1. Albeladi FI, Algethamy HM (2017) Urinary Neutrophil Gelatinase-Associated Lipocalin as a Predictor of Acute Kidney Injury, Severe Kidney Injury, and the Need for Renal Replacement Therapy in the Intensive Care Unit. *Nephron extra* 7: 62-77
2. Alge JL, Karakala N, Neely BA, Janech MG, Tumlin JA, Chawla LS, Shaw AD, Arthur JM (2013) Urinary angiotensinogen and risk of severe AKI. *Clinical journal of the American Society of Nephrology : CJASN* 8: 184-193
3. Bagshaw SM, Bennett M, Haase M, Haase-Fielitz A, Egi M, Morimatsu H, D'Amico G, Goldsmith D, Devarajan P, Bellomo R (2010) Plasma and urine neutrophil gelatinase-associated lipocalin in septic versus non-septic acute kidney injury in critical illness. *Intensive care medicine* 36: 452-461
4. Cemil K, Elif C, Serkan YM, Fevzi Y, Deniz AE, Tamer D, Polat D (2014) The value of serum NGAL in determination of dialysis indication. *JPMMA The Journal of the Pakistan Medical Association* 64: 739-742
5. Chun W, Kim Y, Yoon J, Lee S, Yim H, Cho YS, Kym D, Hur J, Yang HT (2017) Assessment of Plasma Neutrophil Gelatinase-Associated Lipocalin for Early Detection of Acute Kidney Injury and Prediction of Mortality in Severely Burned Patients. *J Burn Care Res*
6. Constantin JM, Futier E, Perbet S, Roszyk L, Lautrette A, Gillart T, Guerin R, Jabaudon M, Souweine B, Bazin JE, Sapin V (2010) Plasma neutrophil gelatinase-associated lipocalin is an early marker of acute kidney injury in adult critically ill patients: a prospective study. *Journal of critical care* 25: 176.e171-176

7. Cruz DN, de Cal M, Garzotto F, Perazella MA, Lentini P, Corradi V, Piccinni P, Ronco C (2009) Plasma neutrophil gelatinase-associated lipocalin is an early biomarker for acute kidney injury in an adult ICU population. *Intensive care medicine* 36: 444-451
8. de Geus HR, Bakker J, Lesaffre EM, le Noble JL (2011) Neutrophil gelatinase-associated lipocalin at ICU admission predicts for acute kidney injury in adult patients. *Am J Respir Crit Care Med* 183: 907-914
9. Dihazi H, Koziolok MJ, Datta RR, Wallbach M, Jung K, Heise D, Dihazi GH, Markovic I, Asif AR, Muller GA (2016) FABP1 and FABP3 Have High Predictive Values for Renal Replacement Therapy in Patients with Acute Kidney Injury. *Blood purification* 42: 202-213
10. Drey M, Behnes M, Kob R, Lepiorz D, Hettwer S, Bollheimer C, Sieber CC, Bertsch T, Hoffmann U (2015) C-terminal agrin fragment (CAF) reflects renal function in patients suffering from severe sepsis or septic shock. *Clinical laboratory* 61: 69-76
11. Du J, Cao X, Zou L, Chen Y, Guo J, Chen Z, Hu S, Zheng Z (2013) MicroRNA-21 and risk of severe acute kidney injury and poor outcomes after adult cardiac surgery. *PloS one* 8: e63390
12. Dusse F, Edayadiyil-Dudasova M, Thielmann M, Wendt D, Kahlert P, Demircioglu E, Jakob H, Schaefer ST, Pilarczyk K (2016) Early prediction of acute kidney injury after transapical and transaortic aortic valve implantation with urinary G1 cell cycle arrest biomarkers. *BMC anesthesiology* 16: 76
13. Endre ZH, Pickering JW, Walker RJ, Devarajan P, Edelstein CL, Bonventre JV, Frampton CM, Bennett MR, Ma Q, Sabbiseti VS, Vaidya VS, Walcher AM, Shaw GM, Henderson SJ, Nejat M, Schollum JB, George PM (2011) Improved performance of urinary biomarkers of acute kidney injury in the critically ill by stratification for injury duration and baseline renal function. *Kidney international* 79: 1119-1130
14. Endre ZH, Walker RJ, Pickering JW, Shaw GM, Frampton CM, Henderson SJ, Hutchison R, Mehrtens JE, Robinson JM, Schollum JB, Westhuyzen J, Celi LA, McGinley RJ, Campbell IJ, George PM (2010) Early intervention with erythropoietin does not affect the outcome of acute kidney injury (the EARLYARF trial). *Kidney international* 77: 1020-1030
15. Gaipov A, Solak Y, Turkmen K, Toker A, Baysal AN, Cicekler H, Biyik Z, Erdur FM, Kilicaslan A, Anil M, Gormus N, Tonbul HZ, Yeksan M, Turk S (2015) Serum uric acid may predict development of progressive acute kidney injury after open heart surgery. *Renal failure* 37: 96-102
16. Garcia-Alvarez M, Glassford NJ, Betbese AJ, Ordonez J, Banos V, Argilaga M, Martinez A, Suzuki S, Schneider AG, Eastwood GM, Victoria Moral M, Bellomo R (2015) Urinary Neutrophil Gelatinase-Associated Lipocalin as Predictor of Short- or Long-Term Outcomes in Cardiac Surgery Patients. *Journal of cardiothoracic and vascular anesthesia* 29: 1480-1488
17. Glassford NJ, Schneider AG, Xu S, Eastwood GM, Young H, Peck L, Venge P, Bellomo R (2013) The nature and discriminatory value of urinary neutrophil gelatinase-associated lipocalin in critically ill patients at risk of acute kidney injury. *Intensive care medicine* 39: 1714-1724
18. Gocze I, Koch M, Renner P, Zeman F, Graf BM, Dahlke MH, Nerlich M, Schlitt HJ, Kellum JA, Bein T (2015) Urinary biomarkers TIMP-2 and IGFBP7 early predict acute kidney injury after major surgery. *PloS one* 10: e0120863

19. Haase-Fielitz A, Bellomo R, Devarajan P, Bennett M, Story D, Matalanis G, Frei U, Dragun D, Haase M (2009) The predictive performance of plasma neutrophil gelatinase-associated lipocalin (NGAL) increases with grade of acute kidney injury. *Nephrology, dialysis, transplantation : official publication of the European Dialysis and Transplant Association - European Renal Association* 24: 3349-3354
20. Haase-Fielitz A, Mertens PR, Plass M, Kuppe H, Hetzer R, Westerman M, Ostland V, Prowle JR, Bellomo R, Haase M (2011) Urine hepcidin has additive value in ruling out cardiopulmonary bypass-associated acute kidney injury: an observational cohort study. *Critical care (London, England)* 15: R186
21. Haines R, Crichton S, Wilson J, Treacher D, Ostermann M (2017) Cardiac biomarkers are associated with maximum stage of acute kidney injury in critically ill patients: a prospective analysis. *Critical care (London, England)* 21: 88
22. Hanson J, Hasan MM, Royakkers AA, Alam S, Charunwatthana P, Maude RJ, Douthwaite ST, Yunus EB, Mantha ML, Schultz MJ, Faiz MA, White NJ, Day NP, Dondorp AM (2011) Laboratory prediction of the requirement for renal replacement in acute falciparum malaria. *Malaria journal* 10: 217
23. Herget-Rosenthal S, Marggraf G, Husing J, Goring F, Pietruck F, Janssen O, Philipp T, Kribben A (2004) Early detection of acute renal failure by serum cystatin C. *Kidney international* 66: 1115-1122
24. Herget-Rosenthal S, Poppen D, Husing J, Marggraf G, Pietruck F, Jakob HG, Philipp T, Kribben A (2004) Prognostic value of tubular proteinuria and enzymuria in nonoliguric acute tubular necrosis. *Clin Chem* 50: 552-558
25. Hjortrup PB, Haase N, Treschow F, Moller MH, Perner A (2015) Predictive value of NGAL for use of renal replacement therapy in patients with severe sepsis. *Acta anaesthesiologica Scandinavica* 59: 25-34
26. Ho PW, Pang WF, Luk CC, Ng JK, Chow KM, Kwan BC, Li PK, Szeto CC (2017) Urinary Mitochondrial DNA Level as a Biomarker of Acute Kidney Injury Severity. *Kidney Dis (Basel)* 3: 78-83
27. Hu Q, Ren J, Wu J, Li G, Wu X, Liu S, Wang G, Gu G, Ren H, Hong Z, Li J (2017) Urinary Mitochondrial DNA Levels Identify Acute Kidney Injury in Surgical Critical Illness Patients. *Shock* 48: 11-17
28. Itenov TS, Jensen JU, Ostrowski SR, Johansson PI, Thormar KM, Lundgren JD, Bestle MH, Procalcitonin, Survival Study" study g (2017) Endothelial Damage Signals Refractory Acute Kidney Injury in Critically Ill Patients. *Shock* 47: 696-701
29. Jalkanen V, Yang R, Linko R, Huhtala H, Okkonen M, Varpula T, Pettila V, Tenhunen J (2013) SuPAR and PAI-1 in critically ill, mechanically ventilated patients. *Intensive care medicine* 39: 489-496
30. Kiessling AH, Dietz J, Reyher C, Stock UA, Beiras-Fernandez A, Moritz A (2014) Early postoperative serum cystatin C predicts severe acute kidney injury following cardiac surgery: a post-hoc analysis of a randomized controlled trial. *Journal of cardiothoracic surgery* 9: 10
31. Kim H, Hur M, Lee S, Marino R, Magrini L, Cardelli P, Struck J, Bergmann A, Hartmann O, Di Somma S, Network G (2017) Proenkephalin, Neutrophil Gelatinase-Associated Lipocalin, and Estimated Glomerular Filtration Rates in Patients With Sepsis. *Ann Lab Med* 37: 388-397

32. Koyner JL, Davison DL, Brasha-Mitchell E, Chalikonda DM, Arthur JM, Shaw AD, Tumlin JA, Trevino SA, Bennett MR, Kimmel PL, Seneff MG, Chawla LS (2015) Furosemide Stress Test and Biomarkers for the Prediction of AKI Severity. *Journal of the American Society of Nephrology : JASN* 26: 2023-2031
33. Koziolok MJ, Datta RR, Mattes H, Jung K, Heise D, Streich JH, Muhlhausen J, Mueller GA, Dihazi H (2012) Predictors of renal replacement therapy in acute kidney injury. *Nephron extra* 2: 247-255
34. Linko R, Pettila V, Kuitunen A, Korhonen AM, Nisula S, Alila S, Kiviniemi O, Laru-Sompa R, Varpula T, Karlsson S (2013) Plasma neutrophil gelatinase-associated lipocalin and adverse outcome in critically ill patients with ventilatory support. *Acta anaesthesiologica Scandinavica* 57: 855-862
35. Lukasz A, Beneke J, Menne J, Vetter F, Schmidt BM, Schiffer M, Haller H, Kumpers P, Kielstein JT (2014) Serum neutrophil gelatinase-associated lipocalin (NGAL) in patients with Shiga toxin mediated haemolytic uraemic syndrome (STEC-HUS). *Thrombosis and haemostasis* 111: 365-372
36. Mahdavi-Mazdeh M, Amerian M, Abdollahi A, Hatmi ZN, Khatami MR (2012) Comparison of Serum Neutrophil Gelatinase-associated Lipocalin (NGAL) with Serum Creatinine in Prediction of Kidney Recovery after Renal Transplantation. *International journal of organ transplantation medicine* 3: 176-182
37. Maisel AS, Wettersten N, van Veldhuisen DJ, Mueller C, Filippatos G, Nowak R, Hogan C, Kontos MC, Cannon CM, Muller GA, Birkhahn R, Clopton P, Taub P, Vilke GM, McDonald K, Mahon N, Nunez J, Briguori C, Passino C, Murray PT (2016) Neutrophil Gelatinase-Associated Lipocalin for Acute Kidney Injury During Acute Heart Failure Hospitalizations: The AKINESIS Study. *Journal of the American College of Cardiology* 68: 1420-1431
38. Martensson J, Vaara ST, Pettila V, Ala-Kokko T, Karlsson S, Inkinen O, Uusaro A, Larsson A, Bell M (2017) Assessment of plasma endostatin to predict acute kidney injury in critically ill patients. *Acta anaesthesiologica Scandinavica*
39. McIlroy DR, Farkas D, Matto M, Lee HT (2015) Neutrophil gelatinase-associated lipocalin combined with delta serum creatinine provides early risk stratification for adverse outcomes after cardiac surgery: a prospective observational study. *Critical care medicine* 43: 1043-1052
40. Nejat M, Pickering JW, Walker RJ, Endre ZH (2010) Rapid detection of acute kidney injury by plasma cystatin C in the intensive care unit. *Nephrology, dialysis, transplantation : official publication of the European Dialysis and Transplant Association - European Renal Association* 25: 3283-3289
41. Nisula S, Yang R, Kaukonen KM, Vaara ST, Kuitunen A, Tenhunen J, Pettila V, Korhonen AM (2014) The urine protein NGAL predicts renal replacement therapy, but not acute kidney injury or 90-day mortality in critically ill adult patients. *Anesthesia and analgesia* 119: 95-102
42. Nisula S, Yang R, Poukkanen M, Vaara ST, Kaukonen KM, Tallgren M, Haapio M, Tenhunen J, Korhonen AM, Pettila V (2015) Predictive value of urine interleukin-18 in the evolution and outcome of acute kidney injury in critically ill adult patients. *British journal of anaesthesia* 114: 460-468
43. O'Sullivan ED, Doyle A (2017) The clinical utility of kinetic glomerular filtration rate. *Clin Kidney J* 10: 202-208

44. Park MY, Choi SJ, Kim JK, Hwang SD, Lee YW (2013) Urinary cystatin C levels as a diagnostic and prognostic biomarker in patients with acute kidney injury. *Nephrology (Carlton, Vic)* 18: 256-262
45. Pianta TJ, Peake PW, Pickering JW, Kelleher M, Buckley NA, Endre ZH (2015) Evaluation of biomarkers of cell cycle arrest and inflammation in prediction of dialysis or recovery after kidney transplantation. *Transplant international : official journal of the European Society for Organ Transplantation* 28: 1392-1404
46. Pickering JW, Endre ZH (2013) The clinical utility of plasma neutrophil gelatinase-associated lipocalin in acute kidney injury. *Blood purification* 35: 295-302
47. Pickering JW, Frampton CM, Walker RJ, Shaw GM, Endre ZH (2012) Four hour creatinine clearance is better than plasma creatinine for monitoring renal function in critically ill patients. *Critical care (London, England)* 16: R107
48. Plewes K, Kingston HWF, Ghose A, Maude RJ, Herdman MT, Leopold SJ, Ishioka H, Hasan MMU, Haider MS, Alam S, Piera KA, Charunwatthana P, Silamut K, Yeo TW, Faiz MA, Lee SJ, Mukaka M, Turner GDH, Anstey NM, Jackson Roberts 2nd L, White NJ, Day NPJ, Hossain MA, Dondorp AM (2017) Cell-free hemoglobin mediated oxidative stress is associated with acute kidney injury and renal replacement therapy in severe falciparum malaria: an observational study. *BMC infectious diseases* 17: 313-313
49. Pipili C, Ioannidou S, Tripodaki ES, Parisi M, Douka E, Vasileiadis I, Joannidis M, Nanas S (2014) Prediction of the renal replacement therapy requirement in mechanically ventilated critically ill patients by combining biomarkers for glomerular filtration and tubular damage. *Journal of critical care* 29: 692.e697-613
50. Ralib AM, Pickering JW, Shaw GM, Devarajan P, Edelstein CL, Bonventre JV, Endre ZH (2012) Test characteristics of urinary biomarkers depend on quantitation method in acute kidney injury. *Journal of the American Society of Nephrology : JASN* 23: 322-333
51. Renhua L, Miaolin C, Junlin W, Qingwei W, Xiaoping X, Huili D, Weiming Z, Zhaohui N, Jiaqi Q, Yan Y (2014) The level of the biomarkers at the time of nephrology consultation might predict the prognosis of acute kidney injury in hospitalized patients. *BioMed research international* 38: 89-95
52. Rewa O, Wald R, Adhikari NK, Hladunewich M, Lapinsky S, Muscedere J, Bagshaw SM, Smith OM, Lebovic G, Kuint R, Klein DJ (2015) Whole-blood neutrophil gelatinase-associated lipocalin to predict adverse events in acute kidney injury: A prospective observational cohort study. *Journal of critical care* 30: 1359-1364
53. Royakkers AA, Bouman CS, Stassen PM, Korevaar JC, Binnekade JM, van de Hoek W, Kuiper MA, Spronk PE, Schultz MJ (2012) Systemic and urinary neutrophil gelatinase-associated lipocalins are poor predictors of acute kidney injury in unselected critically ill patients. *Crit Care Res Pract* 2012: 712695
54. Royakkers AA, Korevaar JC, van Suijlen JD, Hofstra LS, Kuiper MA, Spronk PE, Schultz MJ, Bouman CS (2011) Serum and urine cystatin C are poor biomarkers for acute kidney injury and renal replacement therapy. *Intensive care medicine* 37: 493-501
55. Shum HP, Leung NY, Chang LL, Tam OY, Kwan AM, Chan KC, Yan WW, Chan TM (2015) Predictive value of plasma neutrophil gelatinase-associated lipocalin for acute kidney injury in intensive care unit patients after major non-cardiac surgery. *Nephrology (Carlton, Vic)* 20: 375-382

56. Siew ED, Ikizler TA, Gebretsadik T, Shintani A, Wickersham N, Bossert F, Peterson JF, Parikh CR, May AK, Ware LB (2010) Elevated urinary IL-18 levels at the time of ICU admission predict adverse clinical outcomes. *Clinical journal of the American Society of Nephrology : CJASN* 5: 1497-1505
57. Siew ED, Ware LB, Bian A, Shintani A, Eden SK, Wickersham N, Cripps B, Ikizler TA (2013) Distinct injury markers for the early detection and prognosis of incident acute kidney injury in critically ill adults with preserved kidney function. *Kidney international* 84: 786-794
58. Skinner DL, Laing GL, Bruce J, Biccard B, Muckart DJJ (2017) Validating the utilisation of venous bicarbonate as a predictor of acute kidney injury in crush syndrome from sjambok injuries. *S Afr Med J* 107: 446-450
59. Srisawat N, Murugan R, Lee M, Kong L, Carter M, Angus DC, Kellum JA, Genetic, Inflammatory Markers of Sepsis Study I (2011) Plasma neutrophil gelatinase-associated lipocalin predicts recovery from acute kidney injury following community-acquired pneumonia. *Kidney international* 80: 545-552
60. Sumida M, Doi K, Kinoshita O, Kimura M, Ono M, Hamasaki Y, Matsubara T, Ishii T, Yahagi N, Nangaku M, Noiri E (2014) Perioperative plasma neutrophil gelatinase-associated lipocalin measurement in patients who undergo left ventricular assist device implantation surgery. *Circulation journal : official journal of the Japanese Circulation Society* 78: 1891-1899
61. Susantitaphong P, Perianayagam MC, Kang SW, Zhang W, Rao F, O'Connor DT, Jaber BL (2012) Association of functional kallikrein-1 promoter polymorphisms and acute kidney injury: a case-control and longitudinal cohort study. *Nephron Clin Pract* 122: 107-113
62. Tiranathanagul K, Amornsuntorn S, Avihingsanon Y, Srisawat N, Susantitaphong P, Praditpornsilpa K, Tungsanga K, Eiam-Ong S (2013) Potential role of neutrophil gelatinase-associated lipocalin in identifying critically ill patients with acute kidney injury stage 2-3 who subsequently require renal replacement therapy. *Therapeutic apheresis and dialysis : official peer-reviewed journal of the International Society for Apheresis, the Japanese Society for Apheresis, the Japanese Society for Dialysis Therapy* 17: 332-338
63. Valette X, Savary B, Nowoczyn M, Daubin C, Pottier V, Terzi N, Seguin A, Fradin S, Charbonneau P, Hanouz JL, du Cheyron D (2013) Accuracy of plasma neutrophil gelatinase-associated lipocalin in the early diagnosis of contrast-induced acute kidney injury in critical illness. *Intensive care medicine* 39: 857-865