별첨2

비뚤림위험 평가

1. RoB

연번		1
1저자(출판연도)		Lu(2022)
영역	비뚤림위험	사유
Adequate sequence generation (무작위 배정순서 생성)	☐ 낮음 ☐ 높음 ■ 불확실	• They were randomly divided into the PiCCO monitoring group (PiCCO, n = 200) and a control group, without PiCCO monitoring (control; n = 200). • 구체적 방법 언급 없음
Allocation concealment (배정순서 은폐)	☐ 낮음 ☐ 높음 ■ 불확실	• 언급없음
Blinding of participants and personnel (연구 참여자, 연구자에 대한 눈가림)	■ 낮음 ☐ 높음 ☐ 불확실	• 눈가림에 대해 언급은 없었으나 중재결과에 영향을 미치지 않을 것으로 판단됨
Blinding of outcome assessment (결과평가에 대한 눈가림)	■ 낮음 ☐ 높음 ☐ 불확실	• 눈가림에 대해 언급은 없었으나 중재결과에 영향을 미치지 않을 것으로 판단됨
Incomplete outcome data addressed (불충분한 결과자료)	☐ 낮음 ☐ 높음 ■ 불확실	• 언급없음
Free of selective reporting (선택적 보고)	■ 낮음 ☐ 높음 ☐ 불확실	• 관련 내용 확인 안됨
Other bias : Cointervention (그 외 비뚤림)	■ 낮음 ☐ 높음 ☐ 불확실	• 다른 추가검사는 확인안됨
Other bias : Funding (그 외 비뚤림)	■ 낮음 ☐ 높음 ☐ 불확실	• The authors declare that they have no competing interests. • funding 받았다는 언급 없음

연번		2
1저자(출판연도)		Morisawa(2020)
영역	비뚤림위험	사유
Adequate sequence generation (무작위 배정순서 생성)	■ 낮음 □ 높음 □ 불확실	• The enrolled patients were randomized and categorized into the CVP group resuscitated by EGDT-CVP or the GEDI group resuscitated by EGDT-GEDI (Appendix S1: eMethods 2). • The central online randomization procedure was performed with the dynamic allocation technique utilizing the minimization method adjusted for the sequential organ failure assessment (SOFA) score and each participating ICU. Patients who met the exclusion criteria were excluded, and the remaining patients were subsequently allocated according to a 1:1 ratio to the GEDI and CVP groups.
Allocation concealment (배정순서 은폐)	□ 낮음 □ 높음 ■ 불확실	• 언급없음
Blinding of participants and personnel (연구 참여자, 연구자에 대한 눈가림)	■ 낮음 □ 높음 □ 불확실	• Furthermore, as our study was not blinded, physicians could adjust the infusion volume and might intentionally change the extubation timing as well. • 눈가림은 유지되지 않았으나 중재결과에 영향을 미치지 않을 것으로 판단됨
Blinding of outcome assessment (결과평가에 대한 눈가림)	■ 낮음 □ 높음 □ 불확실	• 눈가림은 유지되지 않았으나 중재결과에 영향을 미치지 않을 것으로 판단됨
Incomplete outcome data addressed (불충분한 결과자료)	■ 낮음 □ 높음 □ 불확실	• 중재군: 3명 탈락(3/83, 3.61%) • (1 withdrew consent, 1 data missing, 1 duplicate registration) • 대조군: 2명 탈락(2/81, 2.47%) (2 withdrew consent) • 탈락률이 높지 않음
Free of selective reporting (선택적 보고)	■ 낮음 □ 높음 □ 불확실	• 관련 내용 확인안됨
Other bias : Cointervention (그 외 비뚤림)	■ 낮음 □ 높음 □ 불확실	• PiCCO monitoring 외에 다른 추가 검사 확인안됨
Other bias : Funding (그 외 비뚤림)	■ 낮음 □ 높음 □ 불확실	• No funding information provided • Conflict of interest: YT was a member of the medical advisory board of Pulsion Medical Systems. The other authors declare no competing interests.

연번	3	
1저자(출판연도)	Mutoh(2009)	
영역	**비뚤림위험**	**사유**
Adequate sequence generation (무작위 배정순서 생성)	☐ 낮음 ☐ 높음 ■ 불확실	• Patients were randomly allocated to receive either PiCCO-guided management or institutional standard management using a central venous catheter and PAC • 구체적인 방법 언급없음
Allocation concealment (배정순서 은폐)	☐ 낮음 ☐ 높음 ■ 불확실	• 언급없음
Blinding of participants and personnel (연구 참여자, 연구자에 대한 눈가림)	■ 낮음 ☐ 높음 ☐ 불확실	• unblinded study design • 객관적 지표를 사용하고 있어 연구참여자, 연구자에 대한 눈가림이 결과 평가에 영향을 미치지 않을 것으로 판단
Blinding of outcome assessment (결과평가에 대한 눈가림)	■ 낮음 ☐ 높음 ☐ 불확실	• 객관적 지표를 사용하고 있어 평가자의 눈가림이 결과평가에 영향을 미치지 않을 것으로 판단
Incomplete outcome data addressed (불충분한 결과자료)	☐ 낮음 ☐ 높음 ■ 불확실	• 결측치 별도 언급 없음, 환자 선정과정 명시하고 있지 않음
Free of selective reporting (선택적 보고)	■ 낮음 ☐ 높음 ☐ 불확실	• 관련 내용 확인안됨
Other bias : Cointervention (그 외 비뚤림)	■ 낮음 ☐ 높음 ☐ 불확실	• 비교군에서 DIND가 있을 경우 PAC 삽입해서 PACI 체크함-기존 그룹으로 포함될 수 있다는 소위원회 의견 있었음
Other bias : Funding (그 외 비뚤림)	■ 낮음 ☐ 높음 ☐ 불확실	• Source of Funding: This study was supported in part by an institutional research grant (H201105) from Akita Prefecture

<table>
<tr><td>연번</td><td colspan="2">4</td></tr>
<tr><td>1저자(출판연도)</td><td colspan="2">Pavlovic(2016)</td></tr>
<tr><td>영역</td><td>비뚤림위험</td><td>사유</td></tr>
<tr><td>Adequate sequence generation
(무작위 배정순서 생성)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• Randomization was performed using a “block of 600 and stratified according to sepsis and hypovolemia by computer-generated random numbers using opaque sealed envelopes.</td></tr>
<tr><td>Allocation concealment
(배정순서 은폐)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• Randomization was performed using a “block of 600 and stratified according to sepsis and hypovolemia by computer-generated random numbers using opaque sealed envelopes.</td></tr>
<tr><td>Blinding of participants and personnel
(연구 참여자, 연구자에 대한 눈가림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• Pre- and postoperative medical care was left at the discretion of the ICU physicians who were blinded to the group allocation.
• Finally, the care-giving physicians could not be blinded to the treatment protocol.
• Moreover, care-giving nurses and physicians in ICU as well the research assistants collecting clinical and physiological outcome data were all blinded to group allocation.</td></tr>
<tr><td>Blinding of outcome assessment
(결과평가에 대한 눈가림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• 객관적 지표를 사용하고 있어 평가자의 눈가림이 결과평가에 영향을 미치지 않을 것으로 판단</td></tr>
<tr><td>Incomplete outcome data addressed
(불충분한 결과자료)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• GDT 군 23명 배정, 20명 분석(3/23, 13%)
• Control군 27명 배정, 23명 분석(4/27, 14.8%)
• 양군의 탈락률이 유사하고 크지 않음</td></tr>
<tr><td>Free of selective reporting
(선택적 보고)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• 관련 내용 확인안됨</td></tr>
<tr><td>Other bias : Cointervention
(그 외 비뚤림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td><table><tr><td>중재군 지표</td><td>비교군 지표</td></tr><tr><td>MAP, HR, CVP, diuresis, lactate, ScvO2, Hb, +SVV, GEDVI, EVLWI</td><td>MAP, HR, CVP, diuresis, Lactate, ScvO2, Hb+PPV *pressure pulse variation (PPV)</td></tr></table>• 중재검사 외에 검사항목 유사함</td></tr>
<tr><td>Other bias : Funding
(그 외 비뚤림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• Conflict of interest None.
• funding 언급은 없음</td></tr>
</table>

연번		5
1저자(출판연도)		Schmid(2016)
영역	비뚤림위험	사유
Adequate sequence generation (무작위 배정순서 생성)	■ 낮음 □ 높음 □ 불확실	• Patients were randomly allocated to one of two groups in a 1:1 ratio using a computer-generated list: GDT or control. In the GDT group, the patients' haemodynamic conditions were treated according to an established algorithm, which is an adaption of the one used by Goepfert in patients undergoing cardiac surgery (Fig. 1). • In the control group, haemodynamics were managed using the standard care of our hospital. Prior to anaesthesia induction a study team member assessed the randomisation list.
Allocation concealment (배정순서 은폐)	□ 낮음 □ 높음 ■ 불확실	• 언급없음
Blinding of participants and personnel (연구 참여자, 연구자에 대한 눈가림)	■ 낮음 □ 높음 □ 불확실	• 눈가림에 대해 언급은 없었으나 중재결과에 영향을 미치지 않을 것으로 판단됨
Blinding of outcome assessment (결과평가에 대한 눈가림)	■ 낮음 □ 높음 □ 불확실	• 눈가림에 대해 언급은 없었으나 중재결과에 영향을 미치지 않을 것으로 판단됨
Incomplete outcome data addressed (불충분한 결과자료)	■ 낮음 □ 높음 □ 불확실	• 중재군: 92명 배정, discontinued intervention(protocol violation) 5명 5/92, 5.4% • 비교군: 88명 배정, discontinued intervention(protocol violation 4명, 4/88, 4.5%
Free of selective reporting (선택적 보고)	■ 낮음 □ 높음 □ 불확실	• 관련 내용 확인안됨
Other bias : Cointervention (그 외 비뚤림)	□ 낮음 □ 높음 ■ 불확실	• 비교군에서 사용되는 지표를 구체적으로 언급하고 있지 않음
Other bias : Funding (그 외 비뚤림)	■ 낮음 □ 높음 □ 불확실	• This study was funded by institutional support. • There authors declare that they have no competing interests.

연번		6
1저자(출판연도)		Scully(2019)
영역	비뚤림위험	사유
Adequate sequence generation (무작위 배정순서 생성)	■ 낮음 □ 높음 □ 불확실	• Block randomisation was performed via an independent statistician with block size of 4 and 1:1 allocation.
Allocation concealment (배정순서 은폐)	□ 낮음 □ 높음 ■ 불확실	• 언급없음
Blinding of participants and personnel (연구 참여자, 연구자에 대한 눈가림)	■ 낮음 □ 높음 □ 불확실	• We conducted a non-blinded, randomised controlled study • In the cardiac output monitoring group, despite the presence of an EV1000, the treating team were not mandated to utilise the EV1000 parameters and were free to use non-EV1000 data to guide fluid use. • 눈가림이 중재검사의 의료결과에 영향을 미치지 않았을 것으로 판단됨
Blinding of outcome assessment (결과평가에 대한 눈가림)	■ 낮음 □ 높음 □ 불확실	• We conducted a non-blinded, randomised controlled study • 눈가림이 중재검사의 의료결과에 영향을 미치지 않았을 것으로 판단됨
Incomplete outcome data addressed (불충분한 결과자료)	■ 낮음 □ 높음 □ 불확실	• 중재군:37명 배정, 37명 분석 • 비교군: 43명 배정, 43명 분석
Free of selective reporting (선택적 보고)	■ 낮음 □ 높음 □ 불확실	• 관련 내용 확인안됨
Other bias : Cointervention (그 외 비뚤림)	□ 낮음 □ 높음 ■ 불확실	• 중재군: CO, CI, SVV • 비교군 : 구체적 지표 언급 없음
Other bias : Funding (그 외 비뚤림)	■ 낮음 □ 높음 □ 불확실	• All funding for this study was obtained from Nepean Hospital, NSW. • The authors declare that they have no competing interests.

<table>
<tr><th>연번</th><th colspan="2">7</th></tr>
<tr><th>1저자(출판연도)</th><th colspan="2">Smetkin(2009)</th></tr>
<tr><th>영역</th><th>비뚤림위험</th><th>사유</th></tr>
<tr><td>Adequate sequence generation
(무작위 배정순서 생성)</td><td>☐ 낮음
☐ 높음
■ 불확실</td><td>• were enrolled into a prospective randomized study
• 구체적 랜덤방법 명시하고 있지 않음</td></tr>
<tr><td>Allocation concealment
(배정순서 은폐)</td><td>☐ 낮음
☐ 높음
■ 불확실</td><td>• 언급없음</td></tr>
<tr><td>Blinding of participants and personnel
(연구 참여자, 연구자에 대한 눈가림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• The clinician responsible for patient discharge was blinded for the study groups.
• 연구참여자, 연구자에 대한 눈가림이 결과지표에 영향을 미치지 않을 것으로 판단함</td></tr>
<tr><td>Blinding of outcome assessment
(결과평가에 대한 눈가림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• 결과평가에 대한 눈가림이 결과 평가에 영향을 미치지 않을 것으로 판단함</td></tr>
<tr><td>Incomplete outcome data addressed
(불충분한 결과자료)</td><td>☐ 낮음
☐ 높음
■ 불확실</td><td><table><tr><th></th><th>중재군</th><th>비교군</th></tr><tr><td>배정</td><td></td><td></td></tr><tr><td>탈락</td><td>3</td><td>2</td></tr><tr><td>분석</td><td>20</td><td>20</td></tr></table>• 43 adult patients diagnosed with coronary artery disease, ranked ASA II–III and scheduled for elective OPCAB, were enrolled into a prospective randomized study
• 43명 무작위 배정했다고 했는데 각군당 몇명씩 배정했는지는 언급하고 있지 않으며 최종 20명군에서 분석결과를 제시하고 있음</td></tr>
<tr><td>Free of selective reporting
(선택적 보고)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• 관련 내용 확인 안됨</td></tr>
<tr><td>Other bias : Cointervention
(그 외 비뚤림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• 중재군 지표: CI, ITBVI
• 비교군지표: CVP, HR, MAP</td></tr>
<tr><td>Other bias : Funding
(그 외 비뚤림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• funding, COI 언급없음</td></tr>
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<table>
<tr><th>연번</th><th colspan="2">8</th></tr>
<tr><th>1저자(출판연도)</th><th colspan="2">Tang(2021)</th></tr>
<tr><th>영역</th><th>비뚤림위험</th><th>사유</th></tr>
<tr><td>Adequate sequence generation
(무작위 배정순서 생성)</td><td>■ 낮음
□ 높음
□ 불확실</td><td>• Patients were randomized 1:1 into two groups using a set of computer-generated random numbers kept in sealed envelopes by an investigator not involved in clinical care.`</td></tr>
<tr><td>Allocation concealment
(배정순서 은폐)</td><td>■ 낮음
□ 높음
□ 불확실</td><td>• Envelopes were opened shortly before anesthetic induction. One investigator was unmasked of the allocated intervention and obtained intraoperative data; the other remained unaware of the interventions and assessed postoperative outcomes. The random allocation was also masked from patients, surgeons, and the ward physicians.</td></tr>
<tr><td>Blinding of participants and personnel
(연구 참여자, 연구자에 대한 눈가림)</td><td>■ 낮음
□ 높음
□ 불확실</td><td>• Envelopes were opened shortly before anesthetic induction. One investigator was unmasked of the allocated intervention and obtained intraoperative data; the other remained unaware of the interventions and assessed postoperative outcomes. The random allocation was also masked from patients, surgeons, and the ward physicians.</td></tr>
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(결과평가에 대한 눈가림)</td><td>■ 낮음
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<tr><td>Incomplete outcome data addressed
(불충분한 결과자료)</td><td>■ 낮음
□ 높음
□ 불확실</td><td><table><tr><td>중재군</td><td>비교군</td></tr><tr><td>배정: 38명</td><td>배정:38명</td></tr><tr><td>탈락: 5명 5/38, 13.2%
· operative strategy changed n=2
· Failure to undergo placement of PiCCO catheter n=1
· Episodes of arrhythmia n=2</td><td>탈락 6명 6/38, 15.8%
· Operative strategy changed n=4
· Episodes of arrhythmia n=2</td></tr><tr><td>분석:33명</td><td>분석: 32명</td></tr></table>• 양군 탈락률 유사함</td></tr>
<tr><td>Free of selective reporting
(선택적 보고)</td><td>■ 낮음
□ 높음
□ 불확실</td><td>• 관련 내용 확인안됨</td></tr>
<tr><td>Other bias : Cointervention
(그 외 비뚤림)</td><td>□ 낮음
□ 높음
■ 불확실</td><td>• 중재군: CO, CI, SVV, 비교군 지표는 구체적으로 언급하고 있지 않음</td></tr>
<tr><td>Other bias : Funding
(그 외 비뚤림)</td><td>■ 낮음
□ 높음
□ 불확실</td><td>• This work was supported by Shanghai Municipal Commission of Health (202040200) and Project 82071233 supported by the National Natural Science Foundation of China.
• Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.</td></tr>
</table>

<table>
<tr><th>연번</th><th colspan="2">9</th></tr>
<tr><th>1저자(출판연도)</th><th colspan="2">Yuanbo(2016)</th></tr>
<tr><th>영역</th><th>비뚤림위험</th><th>사유</th></tr>
<tr><td>Adequate sequence generation
(무작위 배정순서 생성)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• All patients were randomized to the PiCCO or CVP group using a randomization sequence generated with Stata 12.0 (StataCorp, College Station, TX, USA). Randomization was stratified according to the presence of shock and using a 1:1 ratio</td></tr>
<tr><td>Allocation concealment
(배정순서 은폐)</td><td>☐ 낮음
☐ 높음
■ 불확실</td><td>• 언급없음</td></tr>
<tr><td>Blinding of participants and personnel
(연구 참여자, 연구자에 대한 눈가림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• Investigators who collected the baseline characteristics and follow-up results were blinded to grouping
• 눈가림이 중재결과에 영향을 미치지 않을 것으로 판단됨</td></tr>
<tr><td>Blinding of outcome assessment
(결과평가에 대한 눈가림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• Investigators who collected the baseline characteristics and follow-up results were blinded to grouping
• 눈가림이 중재결과에 영향을 미치지 않을 것으로 판단됨</td></tr>
<tr><td>Incomplete outcome data addressed
(불충분한 결과자료)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td><table><tr><th>중재군</th><th>비교군</th></tr><tr><td>배정: 151</td><td>배정: 151</td></tr><tr><td>탈락: 21, 21/151, 13.9%
n=3, lost to follow up(transfer to another hospital)
n=16 discontinued intervention
n=3, adverse event
n=15 withdrew consent</td><td>탈락: 13, 13/151, 8.6%
n=6, lost to follow-up(transfer to another hospital)
n=13, discondinued intervention
n=1, adverse event
n=6,withdrew consent</td></tr><tr><td>분석: 126</td><td>분석: 126</td></tr></table></td></tr>
<tr><td>Free of selective reporting
(선택적 보고)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• 관련 내용 확인안됨</td></tr>
<tr><td>Other bias : Cointervention
(그 외 비뚤림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• 중재군: ITBVI, MAP, EVLWI, CI
• 비교군: CVP, MAP</td></tr>
<tr><td>Other bias : Funding
(그 외 비뚤림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• The study was supported by the Science and Technology Planning Foundation of Shenzhen City (approval no. 201201011).
• The authors declare that they have no competing interests.</td></tr>
</table>

<table>
<tr><th colspan="2">연번</th><th>10</th></tr>
<tr><th colspan="2">1저자(출판연도)</th><th>Zhang(3019)</th></tr>
<tr><th>영역</th><th>비뚤림위험</th><th>사유</th></tr>
<tr><td>Adequate sequence generation
(무작위 배정순서 생성)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• Patients that met the inclusion criteria were randomly assigned to either PiCCO or control groups based on the random number table method</td></tr>
<tr><td>Allocation concealment
(배정순서 은폐)</td><td>☐ 낮음
☐ 높음
■ 불확실</td><td>• 언급없음</td></tr>
<tr><td>Blinding of participants and personnel
(연구 참여자, 연구자에 대한 눈가림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• 언급없음
• 눈가림이 중재결과에 영향을 미치지 않을 것으로 판단됨</td></tr>
<tr><td>Blinding of outcome assessment
(결과평가에 대한 눈가림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• 언급없음
• 눈가림이 중재결과에 영향을 미치지 않을 것으로 판단됨</td></tr>
<tr><td>Incomplete outcome data addressed
(불충분한 결과자료)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td><table><tr><th>중재군</th><th>비교군</th></tr><tr><td>배정: 34</td><td>배정: 35</td></tr><tr><td>탈락: 4, 4/34, 11.8%
lost to follow up(transfer to another hospital), n=4</td><td>탈락: 4, 4/35, 11.4%
lost to follow up(transfer to another hospital), n=5</td></tr><tr><td>분석: n=30</td><td>분석: n=30</td></tr></table></td></tr>
<tr><td>Free of selective reporting
(선택적 보고)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• 관련 내용 확인안됨</td></tr>
<tr><td>Other bias : Cointervention
(그 외 비뚤림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• 중재군: CI, GEDI, EVLWI
• 비교군: BP, HR, CVP</td></tr>
<tr><td>Other bias : Funding
(그 외 비뚤림)</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• The authors of this manuscript have no conflicts of interest to disclose.
• fund 언급없음</td></tr>
</table>

2. RoBANS 2.0

연번		1
1저자(출판연도)		Adler(2013)
영역	비뚤림위험	사유
대상군 비교 가능성	■ 낮음 □ 높음 □ 불확실	• clinical characteristics of the patients _table 1 확인: p=NS
대상군 선정	■ 낮음 □ 높음 □ 불확실	• In this study, we retrospectively reviewed the fluid therapy of **patients in cardiogenic shock after OHCA** comparing patients with and without hemodynamic and volumetric monitoring. All patients were treated with MTH for 24 h in the intensive care unit (ICU) of the Heart Centre of the University of Cologne between November 2007 and October 2010. • Patients **were enrolled in the study** if they fulfilled the **inclusion criteria** (OHCA, ROSC, ≥18 years, GCS ≤ 8 and cardiogenic shock) and all relevant data during the observation period was documented. **Criteria for cardiogenic shock** were adopted in a modified version from the SHOCK-Trial. • Patients **were included** if they showed hypotension with systolic blood pressure 〈90 mm Hg for at least 30 min. Patients with systolic blood pressure higher than 90 mm Hg supported by catecholamines and typical clinical signs of end-organ hypoperfusion like cool extremities and cyanosis were also included.
교란변수	■ 낮음 □ 높음 □ 불확실	• Categorical data, particularly the occurrence of AKI (RIFLE criteria), were compared between groups by Fisher's exact test and **binary logistic regression adjusted for multivariable** • **propensity score (based on sex, age, diabetes, arterial hypertension, time to ROSC, volume of contrast medium etc.).**
노출 측정	■ 낮음 □ 높음 □ 불확실	• 중재군: PICCO monitoring ▶ In hemodynamic monitored patients fluid management was assessed by measurements of global end diastolic volume index (GEDI target between 700 and 800 ml/m2) as a prediction preload value and extravascular lung water index (ELWI target ≤ 10 ml/kg) as a volume parameter for detecting and quantification of pulmonary edema.19,20 Further on, pulmonary vascular permeability index (PVPI) was measured to specify the difference between hydrostatic lung edema (PVPI ≤ 3) and permeability lung edema (PVPI 〉 3).21 Decisions regarding volume therapy were also based on arterial waveform derived variables, (PPV target 〈 10% and SVV target 〈 10%). The complete treatment algorithm is shown in Fig. 1 • 비교군 conventional monitoring ▶ In standard ICU monitored patients their application was performed based on conventional ICU monitoring, urine output and fluid requirements at the discretion of the attending physician. In addition, fluid management was controlled by clinical signs of possible volume overload, like peripheral edema, filled jugular veins and lung auscultation at regular intervals.
평가자의 눈가림	■ 낮음 □ 높음 □ 불확실	• retrospective 연구이므로 평가자가 결과 평가에 영향을 미치지 않은 것으로 판단
결과 평가	■ 낮음	• Acute kidney injury (AKI) was defined by the RIFLE criteria.22

	□ 높음 □ 불확실	On this basis, patients with an increase in serum creatinine or a reduced urine secretion were categorized into at risk of AKI, kidney injury or kidney failure. Since only one patient (conventional monitoring) fulfilled the criteria of kidney failure we have combined the categories kidney injury and kidney failure for further analysis. All OHCA and clinic data was reviewed retrospectively by analyzing the documented records of pre-hospital emergency team and the intensive care unit. • 대부분 객관적인 지표이며, 사건발생의 경우 정의를 제시하고 있음
불완전한 결과자료	■ 낮음 □ 높음 □ 불확실	• 후향적 연구여서 해당사항 없음
선택적 결과 보고	■ 낮음 □ 높음 □ 불확실	• 프로토콜에서 제시한 내용 모두 보고함

연번		2
1저자(출판연도)		Ali(2019)
영역	비뚤림위험	사유
대상군 비교 가능성	■ 낮음 □ 높음 □ 불확실	• Characteristics of patients-table 1, p=NS
대상군 선정	■ 낮음 □ 높음 □ 불확실	• The present study inclusion criteria were (1) age 〉 18 years; (2) non-traumatic SAH and the presence of an aneurysm identified on diagnostic cerebral angiography (DSA); (3) score 〈 4 on the informant questionnaire on cognitive decline in the elderly short form (IQCODE-SF; this questionnaire was provided to patients' relatives on the first day of admission to evaluate if the patient had dementia prior to aSAH; (4) admission to neuro ICU ≤ 2 days following ictus; (5) neuro ICU follow-up until the 14th day following aSAH; and (6) acceptance to participate.
교란변수	■ 낮음 □ 높음 □ 불확실	• The univariate and multivariate binary logistic regression analyses were performed to determine the strength of variables in predicting the number of patients with poor MoCA score in both cohorts separately. Because of fewer cases in each cohort, first, the significant relation was tested using the univariate regression analysis, and then the significant variables in the multiple regression analysis were utilized
노출 측정	■ 낮음 □ 높음 □ 불확실	• 중재기술: Transpulmonary thermodilution (TPT) monitor-guided hemodynamic management · Baseline fluid balance and hemodynamics of patients were managed by the PiCCO monitor that aimed to keep CI value between 3 and 5 l/min/m2 , GEDI value between 680 and 800 ml/m2 , MAP value 〉 80 mmHg, and ELWI value ≤ 12 ml/kg. · When DCI-related neurological deterioration was diagnosed, additional colloid or crystalloid was administered to the patient to obtain 50 ml/m2 increase in GEDI value (maximum allowable GEDI value was 900 ml/m2). Further, CI value was increased stepwise until symptoms of DCI disappeared (maximum allowable CI value was 6 l/min/m2). If ELWI value was 〉 14 ml/kg or patients showed any sign of congestive heart failure or PE, fluid loading was stopped and furosemide was administered until the symptoms disappeared, and ELWI value was reduced to 14 ml/kg. Noradrenaline (0.01-0.3 μg/kg/min) and/or dopamine (5-20 μg/kg/min) and/or dobutamine (5-20 μg/kg/min) were used for CI augmentation. • 비교기술: traditional parameter-guided hemodynamic management · All patients had a 7-Fr central venous catheter inserted into the subclavian vein. During neuro ICU follow-up, normovolemia and MAP were maintained at 〉 80 mmHg. Volume status was determined based on CVP value, HR, arterial blood pressure, fluid balance, and clinical examination, including dry mouth, urine output, and skin turgor. Patients received a baseline infusion of crystalloid (1500-3000 ml/day). CVP value was maintained between 5 and 8 mmHg, and at least 750 ml of positive daily fluid balance was provided. · When Delayed cerebral ischemia (DCI)-related neurological deterioration was diagnosed, the maintenance goals were changed to CVP value of 8-12 mmHg and at least 1000 ml of positive daily fluid balance. Volume expansion was provided by additional colloid

<table>
<tr><th>연번</th><th></th><th>2</th></tr>
<tr><th>1저자(출판연도)</th><th></th><th>Ali(2019)</th></tr>
<tr><td></td><td></td><td>or crystalloid infusion. Further, arterial blood pressure was increased stepwise until the symptoms of DCI disappeared (maximum allowable systolic blood pressure and MAP were 200 and 140 mmHg, respectively). Noradrenaline (0.01– 0.3 μg/kg/min) and/or dopamine (5–20 μg/kg/min) and/or dobutamine (5–20 μg/kg/min) were used for arterial blood pressure augmentation</td></tr>
<tr><td>평가자의 눈가림</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• The MoCA test was made by a psychologist who was blinded to subjects.
• mRS was assessed by one of the researchers who were not blinded to patients.
• 결과지표가 그룹배정에 대한 눈가림에 대해 영향을 받지 않으로 판단됨</td></tr>
<tr><td>결과 평가</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• Measurements and definitions에 결과지표에 대한 정의를 상세히 기술하고 있음</td></tr>
<tr><td>불완전한 결과자료</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• cohort 1: 비교군, cohort 2: 중재군
<table><tr><th>중재군 n=52</th><th>비교군 n=56</th></tr><tr><td>연구 참여 n=48</td><td>연구참여 n=41</td></tr><tr><td>missing data n=3, 6.3%</td><td>missing data n=2, 4.9%</td></tr><tr><td>연구완료 n=45</td><td>연구완료 n=39</td></tr></table>• 양군의 결측치가 높지 않음</td></tr>
<tr><td>선택적 결과 보고</td><td>■ 낮음
☐ 높음
☐ 불확실</td><td>• 프로토콜에서 제시한 내용 모두 보고함</td></tr>
</table>

연번		3
1저자(출판연도)		Chen(2017)
영역	비뚤림위험	사유
대상군 비교 가능성	☐ 낮음 ■ 높음 ☐ 불확실	• ScvO2, PaO2/FiO2, Levels of lactic acid, mean fluid volume 항목은 군간 유의한 차이를 보임
대상군 선정	■ 낮음 ☐ 높음 ☐ 불확실	• This study is a retrospective case series, including 34 seriously burned patients (97≥%TBSA≥ 80, the average TBSA% burn of 87.3±5.6) collected from January 2008 to January 2014. • They all had similar monitoring or treatment modalities at this burn center. Based on a randomized trial (Random Number Table), selected patients were classified into two groups (no significant differences in age, TBSA and treatment modalities between these two groups), an EGDT group and a conventional group (CG). The EGDT group consisted of 13 patients aged from 17 to 62 years old (a mean age of 31.7 years), and the CG group consisted of 21 patients aged from 18 to 71 years old (a mean age of 33.0 years).
교란변수	☐ 낮음 ☐ 높음 ■ 불확실	• 별도의 언급 없음 Patients treated with EGDT were asked to be treated immediately with fluid resuscitation of crystalloid-colloid (ratio 1:1), until their physiological characters reached the resuscitation criteria under PICCO guidance in 6 hours. In EGDT group, CVP was maintained between 8 and 12 cm H2O, mean arterial pressure (MAP) was kept ≥65 mmHg, urine volume was remained ≥1 mL·Kg-1·h-1, and extravascular lung water index (EVLWI) was maintained between 3.0 and 7.0 mL·Kg-1, and some special cases as below were strongly advised to take appropriate doses of norepinephrine booster drug. • 비교군: in control group (CG), patients from were conducted fluid management by traditional formula (First Affiliated Hospital of PLA General Hospital).
노출 측정	☐ 낮음 ☐ 높음 ■ 불확실	• 중재군: Patients treated with EGDT were asked to be treated immediately with fluid resuscitation of crystalloid-colloid (ratio 1:1), until their physiological characters reached the resuscitation criteria under PICCO guidance in 6 hours. In EGDT group, CVP was maintained between 8 and 12 cm H2O, mean arterial pressure (MAP) was kept ≥65 mmHg, urine volume was remained ≥1 mL·Kg-1·h-1, and extravascular lung water index (EVLWI) was maintained between 3.0 and 7.0 mL·Kg-1, and some special cases as below were strongly advised to take appropriate doses of norepinephrine booster drug. • Index for further observation · The needed volume of crystalloid-colloid, the cases of limb peripheral cyanosis, multiple organ dysfunction syndrome(MODS), ultra-capacity, and fatality were all observed and recorded in 48 hours. Additionally hemodynamic parameters, including CVP, CO index, SVRI, GEDI, intrathoracic blood volume index, and EVLWI were also recorded before and after EGDT. • 비교군: in control group (CG), patients from were conducted fluid management by traditional formula (First Affiliated Hospital of PLA General Hospital). • 비교군의 수액조절방법 구체적 내용은 기술되고 있지 않음
평가자의 눈가림	■ 낮음 ☐ 높음	• retrospective 연구임. 평가자의 눈가림이 의료결과에 영향을 미치지 않을 것으로 판단

연번		3
1저자(출판연도)		Chen(2017)
	☐ 불확실	
결과 평가	■ 낮음 ☐ 높음 ☐ 불확실	• 객관적 지표(Mortality 등) 사용
불완전한 결과자료	■ 낮음 ☐ 높음 ☐ 불확실	• 후향적 연구라 해당사항 없음
선택적 결과 보고	■ 낮음 ☐ 높음 ☐ 불확실	• 프로토콜에서 제시한 내용 모두 보고함

연번		4
1저자(출판연도)		Huang(2020)
영역	비뚤림위험	사유
대상군 비교 가능성	■ 낮음 □ 높음 □ 불확실	• table 1-Preoperative characteristics of patients at baseline에서 군간 p값 모두 p>0.05
대상군 선정	■ 낮음 □ 높음 □ 불확실	• We retrospectively reviewed the records of all patients who had undergone complete pericardiectomy for constrictive pericarditis in our department from March 2013 to March 2019. The diagnosis of constrictive pericarditis was determined mainly from clinical symptoms, imaging examinations and CVP.
교란변수	□ 낮음 ■ 높음 □ 불확실	• No adjustment for multiple tests was specified because there was no multiplicity problem in this study.
노출 측정	■ 낮음 □ 높음 □ 불확실	• 중재군: In the PiCCO group, a PiCCO catheter was placed preoperatively into patients through the femoral artery to monitor their haemodynamic status. The management of circulatory volume and the use of vasoactive agents were guided by the PiCCO parameters. • 비교군: In the control group, the patients did not receive PiCCO monitoring and the volume status was assessed by CVP.
평가자의 눈가림	■ 낮음 □ 높음 □ 불확실	• retrospective 연구임. 평가자의 눈가림이 의료결과에 영향을 미치지 않을 것으로 판단
결과 평가	■ 낮음 □ 높음 □ 불확실	• Overall survival was defined as the time interval between the date of the operation and the date of death or last follow-up. Overall survival was calculated in months. • 변수 정의 및 설명 제시함
불완전한 결과자료	■ 낮음 □ 높음 □ 불확실	• 후향적 연구라 해당사항 없음
선택적 결과 보고	■ 낮음 □ 높음 □ 불확실	• 프로토콜에서 제시한 내용 모두 보고함

연번		5
1저자(출판연도)		Kovacs(2021)
영역	비뚤림위험	사유
대상군 비교 가능성	☐ 낮음 ■ 높음 ☐ 불확실	• Table S1_nonPiCCO, PiCCO group 간 유의한 차이를 보이는 항목이 확인됨(성별, IHCA, Stroke 등)
대상군 선정	■ 낮음 ☐ 높음 ☐ 불확실	• retrospective longitudinal chart review analysis • We included in our analysis those comatose patients who were cooled to 32–34 C for 24 h after ROSC on the basis of the actual ERC (European Resuscitation Council) guidelines [19], were older than 18 years, had no end-stage illness in history, were not pregnant, had no active bleeding, whose cause of cardiac arrest had a probable cardiac origin, and were not involved in a clinical trial. In addition, only patients cooled with the Blanketrol III™ (Cincinatti SubZero Products, Cincinatti, USA) thermo-feedback device were enrolled into the study—those patients whose temperature management was applied with ice packs and/or physical cooling were excluded because target temperatures could not be reached in most of these cases.
교란변수	■ 낮음 ☐ 높음 ☐ 불확실	• Given the significant or marginally significant differences between the study groups including the patients' severity and other characteristics, it is difficult to assess how the hemodynamic management guided by PiCCO™ could affect outcome of the cardiac arrest patients. Therefore, **interaction effects were explored (candidate variable vs. PiCCO™ use vs. mortality) using the same statistical methods as in the bivariate analysis for those variables that had at least marginal associations with both PiCCO™use and mortality.** Additionally, logistic regression analysis was performed using the interaction terms as dummy variables. If there were zero cell sizes, then dummy categories were combined with non-zero cells. In a first set of logistic regression models, all interaction dummy variables were included, and in a second set of models, only statistically significant dummies stayed.
노출 측정	■ 낮음 ☐ 높음 ☐ 불확실	• 중재군: PiCCOTM group, The hemodynamic management was guided by PiCCO™ parameters and the principles of therapy decision tree of Pulsion Medical System [21] were applied for PiCCO™ patients • 비교군: nonPiCCOTM group, Fluid, vasopressor, and inotrope therapy were accomplished by monitoring heart rate (HR), mean arterial pressure (MAP), central venous pressure, diuresis, and lactate levels for patients without PiCCO™.
평가자의 눈가림	■ 낮음 ☐ 높음 ☐ 불확실	• retrospective 연구임. 평가자의 눈가림이 의료결과에 영향을 미치지 않을 것으로 판단
결과 평가	■ 낮음 ☐ 높음 ☐ 불확실	• Primary patient outcome was defined as mortality after 30 days. Secondary patient outcome was defined as mortality after 1 year. All patient follow-up and mortality data were obtained at least up till 1 year after admission based on the health insurance records of the National Health Insurance Fund of Hungary, which contains accurate and valid information on the vital records of the entire population of Hungary. Patients' death as a hard endpoint was defined as passivation of the healthcare ID in the national records.
불완전한 결과자료	■ 낮음	• Not more than 10% of the data were missing;

연번		5
1저자(출판연도)		Kovacs(2021)
	□ 높음 □ 불확실	
선택적 결과 보고	■ 낮음 □ 높음 □ 불확실	• 프로토콜에서 제시한 내용 모두 보고함

연번		6
1저자(출판연도)		Kraft(2013)
영역	비뚤림위험	사유
대상군 비교 가능성	■ 낮음 ☐ 높음 ☐ 불확실	• Table 3_Patient demographics, p=NS
대상군 선정	■ 낮음 ☐ 높음 ☐ 불확실	• This cohort study analyzed seventy six pediatric patients with severe burns over 30% total burn surface area (TBSA) receiving resuscitation guided by transcardiopulmonary thermodilution (PiCCO group) monitoring compared to seventy six conventionally (conventional group) resuscitated patients over the first 20 days with similar demographics and injury characteristics. The PiCCO cohort was matched with Control patients for age, gender and injury characteristics. Patients were admitted to the burn unit between 03/1998 and 06/2008 (Control) and 12/2005 and 08/2008 (PiCCO). All patients were resuscitated according to the Galveston formula with 5000 cc/m2 TBSA burned + 2000 cc/m2 TBSA lactated Ringer's solution given in increments over the first 24 hours. After 24 hours the fluid need was calculated by 3750 ml/m2 BSA burn per day + 1500 ml/m2 BSA per day in the control group.
교란변수	☐ 낮음 ☐ 높음 ■ 불확실	• 언급없음
노출 측정	■ 낮음 ☐ 높음 ☐ 불확실	• 중재군: seventy six pediatric patients with severe burns over 30% total burn surface area (TBSA) receiving resuscitation guided by transcardiopulmonary thermodilution (PiCCO group) monitoring compared. · Resuscitation within the PiCCO group was adjusted by the outcomes of the transcardiopulmonary thermo dilution measurements of CI, EVLWI, and ITBVI after the initial 24 hours. Therapeutic targets were to reach normal ranges, especially to maintain EVLWI below 10. *intrathoracic blood volume index (ITBVI), • 비교군: seventy six conventionally (conventional group) resuscitated patients over the first 20 days with similar demographics and injury characteristics. · All patients were resuscitated according to the Galveston formula with 5000 cc/m2 TBSA burned + 2000 cc/m2 TBSA lactated Ringer's solution given in increments over the first 24 hours. After 24 hours the fluid need was calculated by 3750 ml/m2 BSA burn per day + 1500 ml/m2 BSA per day in the control group.
평가자의 눈가림	■ 낮음 ☐ 높음 ☐ 불확실	• 평가자 눈가림은 수행하지 않았으나 평가자의 눈가림이 의료결과에 영향을 미치지 않을 것으로 판단
결과 평가	■ 낮음 ☐ 높음 ☐ 불확실	• Patient demographics (age, date of burn and admission, sex, burn size, and depth of burn) and concomitant injuries such as inhalation injury, sepsis, morbidity, and mortality were recorded. Sepsis was defined as a positive blood culture or pathologic tissue identifying the pathogen during hospitalization or at autopsy in combination with at least 3 of the following: leucocytosis or leucopenia (〉12,000 or 〈4,000), hyperthermia or hypothermia (〉38.5 or 〈36.5°C), tachycardia

연번		6
1저자(출판연도)		Kraft(2013)
		()150 BPM in childr en), refractory hypotension (systolic BP 〈90 mmHg), thrombocytopenia (platelets 〈50,000/mm3), hyperglycemia (serum glucose 〉240 mg/dl) and enteral feeding intolerance (residuals 〉 200 cc/hr or diarrhea 〉 1 L/day) as previously published.
불완전한 결과자료	■ 낮음 □ 높음 □ 불확실	• 결측치, missing data 언급없음
선택적 결과 보고	■ 낮음 □ 높음 □ 불확실	• 프로토콜에서 제시한 내용 모두 보고함

연번		7
1저자(출판연도)		Li(2022)
영역	비뚤림위험	사유
대상군 비교 가능성	■ 낮음 □ 높음 □ 불확실	• table 1, 군간 p>.05
대상군 선정	■ 낮음 □ 높음 □ 불확실	• Inclusion criteria were as follows: known history of coronary heart disease; orthopnea (inability to lie down); wet rales in the lungs; edema in the lower extremities; echocardiography showing left ventricular end-diastolic diameter of >50 mm and left ventricular ejection fraction (LVEF) of <50%, or chest X-ray showing pulmonary congestion or edema; and type I respiratory failure (partial pressure of oxygen of <50 mm Hg even after oxygen therapy, requiring tracheal intubation and mechanical ventilation after conventional treatments, such as cardiotonic therapy, diuretics, and vasoactive drugs). Exclusion criteria were as follows: heart failure with uncontrolled severe infection, and pulmonary diseases.
교란변수	□ 낮음 □ 높음 ■ 불확실	• 언급없음
노출 측정	■ 낮음 □ 높음 □ 불확실	• 중재검사: In the PiCCO group, a central venous catheter was inserted into the subclavian vein, and an artery thermistor catheter was inserted into the femoral artery. The PiCCO2 monitor (Pulsion Medical Systems, Munich, Germany) was then connected. After a bolus injection of 15 mL of ice-cold saline via the central venous line, the indicators were measured three times, and the mean value was recorded for further analysis. Specifically, CI (cardiac index), GEDVI (global end-diastolic volume index), EVLWI, and systemic vascular resistance index were measured to guide volume management. • 비교검사: In the non-invasive group, the BioZ digital non-invasive hemodynamic monitor (Cardio Dynamics, USA) was used. The patient's height, weight, age, and sex were entered when prompted on the monitor screen. Monitoring began once the cardiac function curve was steady. Monitored indicators included CI, systemic vascular resistance (SVR), acceleration index (ACI; myocardial contractility index), thoracic fluid content (TFC), systolic time ratio (STR), LVET, and pre-ejection period (PEP). Each indicator was measured three times, and the mean value was recorded for further analysis. • A central venous line was inserted via the subclavian vein to monitor CVP in both groups. In addition, echocardiography was performed (patient position: hip angle of 30, halfseating position) to measure LVEF, LVET, and PAP. All echocardiography exams were performed by the same experienced sonographer.
평가자의 눈가림	■ 낮음 □ 높음 □ 불확실	• 눈가림에 대한 언급없음 • 결과지표가 객관적 지표라서 평가자의 눈가림이 결과 평가에 영향을 미치지 않을 것으로 판단함
결과 평가	■ 낮음 □ 높음 □ 불확실	• Hospital stay(CCU stay), Cardiac events, 1 month mortality

연번		7
1저자(출판연도)		Li(2022)
불완전한 결과자료	□ 낮음 □ 높음 ■ 불확실	• 별도로 결측치 언급없음
선택적 결과 보고	■ 낮음 □ 높음 □ 불확실	

연번		8
1저자(출판연도)		Luo(2023)
영역	비뚤림위험	사유
대상군 비교 가능성	■ 낮음 ☐ 높음 ☐ 불확실	• The two groups did not differ greatly in baseline characteristics (p>0.05), which indicated a high degree of comparability.
대상군 선정	■ 낮음 ☐ 높음 ☐ 불확실	• Inclusion criteria: - confirmed to have septic shock; - at the age of 18 to 80; - participation with informed consent. • Exclusion criteria: - having contraindications for PiCCO or critical care ultrasound monitoring; - present with severe arrhythmia; - accompanied with serious organ dysfunction; - diagnosed with conscious disturbance; - early withdrawal.
교란변수	☐ 낮음 ☐ 높음 ■ 불확실	• 언급없음
노출 측정	■ 낮음 ☐ 높음 ☐ 불확실	• 중재검사: Each patient lay in a prostrate position as instructed, and a venous duct (ARROW, REF CS-24301-E) was inserted into the subclavian vein; following that, the PiCCO catheter (PULSION Medical Systems SE, PV2015L20-A) was retained in the femoral artery and connected to the PiCCO monitor (Philips InteliVue MP60, M1012A) to guide fluid resuscitation based on the monitoring results. • 비교검사: The study group underwent fluid resuscitation therapy guided by critical care ultrasound (PHILIPS Saronno ITALY, MCMDO2AA). To gain a clearer picture of the systolic function, ultrasonography was performed by scanning the lower left of the chest with a cardiac probe (frequency: 3 Mhz) to obtain the long axis view and observe the chambers of the heart. Subsequently, the ultrasound system was switched to the M mode, and the sample line was placed at the mitral chordae tendineae to monitor the end-systolic and end-diastole diameters of the left ventricle. To acquire data from the apical four-chamber view, the cardiac probe was placed at the cardiac apex. Then, end-systolic and end-diastolic left ventricular volume, cardiac output, and left ventricular ejection fraction were generated automatically by the ultrasound system.
평가자의 눈가림	■ 낮음 ☐ 높음 ☐ 불확실	• 눈가림에 대한 언급 없음 • 결과지표가 객관적 지표라서 평가자의 눈가림이 결과 평가에 영향을 미치지 않을 것으로 판단함
결과 평가	■ 낮음 ☐ 높음 ☐ 불확실	• ventilation duration, ICU length of stay, CRRT case, 28d mortality, CRI case
불완전한 결과자료	■ 낮음 ☐ 높음 ☐ 불확실	• 결측치 없음
선택적 결과 보고	■ 낮음 ☐ 높음 ☐ 불확실	

연번		9
1저자(출판연도)		Ni(2022)
영역	비뚤림위험	사유
대상군 비교 가능성	■ 낮음 ☐ 높음 ☐ 불확실	• table 1, 군간 p〉.05
대상군 선정	■ 낮음 ☐ 높음 ☐ 불확실	• exclusion criteria 제시하고 있음
교란변수	☐ 낮음 ☐ 높음 ■ 불확실	• 언급없음
노출 측정	■ 낮음 ☐ 높음 ☐ 불확실	• 중재검사: The experimental group received FR through PiCCO monitoring. The procedure was as follows: the catheter (4F, PULSION, Oem1Ony) for PiCCO was inserted into the femoral artery, and a triple-lumen central venous catheter was inserted through the subclavian or intemal jugular vein . The temperature probe for PiCCO was connected, which was also connected to the pressure converter. Subsequently, .9% sodium chloride was rapidly injected into the central vein to the tip of the PiCCO artery catheter through the superior vena cava→right atrium→right ventricle→pulmonary artery → pulmonary capillaries/pulmonary vein → left atrium → left ventricle → ascending aorta → abdominal aorta → femoral artery. Cardiac output was measured using pulse contour analysis and thermodilution techniques. The femoral artery pressure, cardiac output index, cardiac output, and other basic parameters were continuously monitored 3-5 tirnes for each patient, and the calculated average value was recorded. The FR process was dynamically guided based on changes in basic parameter. The dose of norepinephrine, a vasoactive drug was adjusted according to the monitoring value of systemic vascular resistance index (SVRI) to maintain the SVRI at 1700-2400 dyn/s/m2/cm5. Line placement was removed after 5 d • 비교검사: The control group (CO) was treated with FR through transthoracic echocardiography (TTE) monitoring. The procedure was as fo l1ows: TTE was perfonlled with Philips HD color Doppler ullrasound. The blood flow spectrum was recorded from the aortic valve at the apical fifth chamber and left ventricular end-diastolic volume was measured using the bi-plane Simpson method at the apex. The time integral of blood flow velocity was measured. In addition, 5-10 continuus sinus heart rates were measured, and the average value was recorded. The distensibility index of inferior vena cava (dIVC) was measured using the expiratory (Dmax) and inspiratory (Dmin) diameters of the inferior vena cava, dIVC= (Dmax-Dmin)/DminX100%
평가자의 눈가림	■ 낮음 ☐ 높음 ☐ 불확실	• not-double blinded • 결과지표가 객관적 지표라서 평가자의 눈가림이 결과 평가에 영향을 미치지 않을 것으로 판단함
결과 평가	■ 낮음 ☐ 높음 ☐ 불확실	• success rate of fluid resuscitation at 6h, 28 day mortality rate, complications

연번		9
1저자(출판연도)		Ni(2022)
불완전한 결과자료	□ 낮음 □ 높음 ■ 불확실	• 결측치에 대해 별도로 언급없음
선택적 결과 보고	■ 낮음 □ 높음 □ 불확실	

연번		10
1저자(출판연도)		Pan(2021)
영역	비뚤림위험	사유
대상군 비교 가능성	■ 낮음 ☐ 높음 ☐ 불확실	• table 1, 군간 p>.05
대상군 선정	■ 낮음 ☐ 높음 ☐ 불확실	• Inclusion criteria: the enrolled patients 1) met the diagnostic criteria of SMD [14]; 2) had complete clinical data, and 3) aged ≥18 years. Ethics committee of our hospital approved this study, and the participants and their families had been informed and signed the full informed consent form. Exclusion criteria: 1) pregnant and lying-in woman; 2) patients with various heart diseases; 3) patients with malignant tumor, renal function or liver function damage; 4) patients treated with other regimens; 5) those who were allergic to the study medication; 6) referred patients; 7) those who withdrew from the experiment.
교란변수	☐ 낮음 ☐ 높음 ■ 불확실	• 언급없음
노출 측정	■ 낮음 ☐ 높음 ☐ 불확실	• 중재검사: In JG, fluid resuscitation capacity management was carried out under the guidance of PiCCO monitoring technique combined with cTnI detection: referring to EGDT [15] scheme, patients were treated with central venous catheter combined with PICC catheter via femoral artery to detect the hemodynamic changes and give real-time feedback. Besides, cTnI was detect-ed in stages. After admission, 5 ml of venous blood was collected every two days for cTnI detection, and was stored in a cryogenic refrigerator at −70°C for use after centrifugation at 1500×g and 4°C for 10 min. The treatment plan was adjusted according to the hemodynamic indexes of patients monitored by PiCCO combined with cTnI. • 비교검사: Patients in CG were given routine capacity management to: 1) prevent the changes of hemodynamics by central venous catheter, and 2) give medical care to patients according to the EGDT protocol and the resuscitation indicators of routine detection. Treatment plan: the vasoconstrictor norepinephrine was given if the patient's systemic resistance value was lower than the normal range.
평가자의 눈가림	■ 낮음 ☐ 높음 ☐ 불확실	• 눈가림 언급없음 • 결과지표가 객관적 지표라서 평가자의 눈가림이 결과 평가에 영향을 미치지 않을 것으로 판단함
결과 평가	■ 낮음 ☐ 높음 ☐ 불확실	• mechanical ventilation time, ICU stay time, incidence of MODS, 28 day hospitalization mortality
불완전한 결과자료	■ 낮음 ☐ 높음 ☐ 불확실	• 결측치 없음
선택적 결과 보고	■ 낮음 ☐ 높음 ☐ 불확실	

연번		11
1저자(출판연도)		Sun(2015)
영역	비뚤림위험	사유
대상군 비교 가능성	■ 낮음 □ 높음 □ 불확실	• table 1_Comparison of basic data the study group (PiCCO monitoring group) and the control group (PiCCO non-monitoring group) 군간 p>0.05
대상군 선정	■ 낮음 □ 높음 □ 불확실	• The select criteria of SAP referred to the digestive diseases diagnostic criteria of America society [2]. The exclusion criteria: (1) The complications of heart, lung, kidney and other organ dysfunction before the onset. (2) Non-normal fluid therapy for more than 12 h after SAP diagnosis. (3) Acute obstructive biliary pancreatitis. (4) Pregnancy with SAP.
교란변수	□ 낮음 ■ 높음 □ 불확실	• Differences between groups were compared with single factor analysis of variance (One-way ANOVA). Linear correlation of fluid volumes and clinical parameters of two groups at different times were measured using statistical analysis.
노출 측정	■ 낮음 □ 높음 □ 불확실	• 중재군: Every measurement was repeated three times and interval less than 10 min. ITBVI, GEDVI, EVWI and other indexes were obtained by taking the average to determine whether to continue the fluids or vasoactive drugs. • 비교군: Changes of CVP, heart rate, mean arterial pressure, urine volume and HCT index of the control group by fluids infusion test were observed to determine the fluid resuscitation.
평가자의 눈가림	■ 낮음 □ 높음 □ 불확실	• 평가자 눈가림은 수행하지 않았으나 평가자의 눈가림이 의료결과에 영향을 미치지 않을 것으로 판단
결과 평가	■ 낮음 □ 높음 □ 불확실	• Invasive mechanical ventilation indicators: given conventional oxygen therapy or noninvasive mechanical ventilation was still difficult to correct respiratory failure. Respiratory failure indicators: pO2/FiO2 was 300), decreases of lactic acid, urea nitrogen of microcirculation perfusion index in the resuscitation process and changes of APACHE II score of the severity, mean ICU stay, mortality, the ratio of Moderately Severe Acute Pancreatitis (MSAP) diagnosed after 48 h. The evaluation criteria is on the basis of the “The classification of acute pancreatitis e 2012”: the international consensus criteria: revised by Atlanta classification and definition (“2012 Atlanta consensus”) [3].
불완전한 결과자료	■ 낮음 □ 높음 □ 불확실	• 결측치, missing data 언급없음
선택적 결과 보고	■ 낮음 □ 높음 □ 불확실	• 프로토콜에서 제시한 내용 모두 보고함

연번		12
1저자(출판연도)		Wang(2021)
영역	비뚤림위험	사유
대상군 비교 가능성	■ 낮음 □ 높음 □ 불확실	• table 1_Baseline characteristics of young children with EV-A71 induced Severe HFMD, 군간 P>0.05
대상군 선정	■ 낮음 □ 높음 □ 불확실	• Their diagnosis of severe EV71 HFMD, complicated with respiratory and circulatory failure, occurred at stages 3 and 4. At stage 3, the pediatricians found that patients' heart and respiration, blood pressure, and the coldness and dampness in the extremities all increased. In stage 4, patients showed cyanotic, pink phlegm; bloody sputum; hypotension; altered states of consciousness, or oliguria; and, many eventually advanced to respiratory and circulatory failure. From October 2011 to September 2015, the cases of 20 children, successfully treated for stages 3 and 4 HFMD, were reviewed.
교란변수	□ 낮음 □ 높음 ■ 불확실	• 언급없음
노출 측정	■ 낮음 □ 높음 □ 불확실	• 중재군: In the PiCCO group, the hemodynamic parameters were mainly monitored by PiCCO. · Fluid input and urine output were monitored every 8 h and arterial blood gas was tested once daily in both groups. · The PiCCO monitoring procedure: patients' femoral artery was implanted with an PiCCO catheter under the guidance of bedside ultrasound. The PiCCO catheter was manufactured by Pulse Medical System SE, Germany; model, pv2014l16n; outer diameter, 4F; total length, 16 cm. As part of the process, their pulse and invasive blood pressure were continuously monitored by pressure sensor; additionally, every 6 h, 20 ml of 4 °C saline was injected into the conduit to monitor hemodynamic parameters such as cardiac output index (CI); stroke volume index (SI); extra vascular lung water index (EVLWI); global end diastolic volume index (GEDVI); and, systemic vascular resistance index (SVRI), and other such indicators. This saline injection was repeated thrice, and the average value of the parameters was obtained. • 비교군: In control group, the noninvasive blood pressure, respiratory rate, pulse, Electrocardiogram and peripheral oxygen saturation were monitored by ECG monitor. · Fluid input and urine output were monitored every 8 h and arterial blood gas was tested once daily in both groups.
평가자의 눈가림	■ 낮음 □ 높음 □ 불확실	• 평가자 눈가림은 수행하지 않았으나 평가자의 눈가림이 의료결과에 영향을 미치지 않을 것으로 판단
결과 평가	■ 낮음 □ 높음 □ 불확실	• outcome 지표는 객관적인 지표로 확인함
불완전한 결과자료	■ 낮음 □ 높음 □ 불확실	• 결측치 없음
선택적 결과 보고	■ 낮음 □ 높음 □ 불확실	• 프로토콜에서 제시한 내용 모두 보고함

연번		13
1저자(출판연도)		Wernly(2016)
영역	비뚤림위험	사유
대상군 비교 가능성	☐ 낮음 ■ 높음 ☐ 불확실	• table 1_SAPS2 score, lactate, glucose, heart frequency, age 군간 유의한 차이 있음
대상군 선정	☐ 낮음 ☐ 높음 ■ 불확실	• 별도의 기준 제시하고 있지 않음
교란변수	☐ 낮음 ☐ 높음 ■ 불확실	• 언급없음
노출 측정	☐ 낮음 ☐ 높음 ■ 불확실	• 중재기술: patients monitored by PiCCO, 지표: cardiac index, ITBVI, systemic vascular resistance, global end-diastolic volume, extravascular lung water, cardiac output, central venous pressure • 비교기술: those not monitored by thermodilution measurements, 지표: 구체적 언급없음 *No treatment algorithm based on knowledge obtained by the PiCCO monitor was applied.
평가자의 눈가림	■ 낮음 ☐ 높음 ☐ 불확실	• 후향적 연구임, 연구결과가 눈가림에 의해 영향을 받을 것으로 보이지는 않음
결과 평가	☐ 낮음 ☐ 높음 ■ 불확실	• 결과지표에 대해 정의나 기준 설명 언급없음
불완전한 결과자료	■ 낮음 ☐ 높음 ☐ 불확실	• 후향적 연구라서 해당사항 없음
선택적 결과 보고	■ 낮음 ☐ 높음 ☐ 불확실	• 프로토콜에서 제시한 내용 모두 보고함