Appendix A
First Aid – 2026 Evidence to Decision Tables

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Virtual Opioid Poisoning Education and Naloxone Distribution (OPEND) (FA 7443)

QUESTION

VIRTUAL OPIOID POISONING EDUCATION AND NALOXONE DISTRIBUTION	
POPULATION:	People at risk of opioid poisoning or likely to witness opioid poisoning or otherwise interested in OPEND program participation.
INTERVENTION:	Any opioid poisoning education programming with or without naloxone distribution that is conducted entirely at a distance and without in-person interaction between that program personnel and participant.
COMPARISON:	Any comparison.
MAIN OUTCOMES:	Any outcomes.
SETTING:	Worldwide.
PERSPECTIVE:	As opioid poisoning education and naloxone distribution (OPEND) programs are powerful tools against the opioid poisoning crisis, but are often difficult to access for rural, remote, small, and mid-sized communities, virtual OPEND programs can provide life-saving training to underserved areas.
BACKGROUND:	The opioid poisoning and drug toxicity crisis is a complex and multi-faceted public health epidemic, with far-reaching population effects.[1] Opioid-related harms can affect people in all communities, ages, and socioeconomic groups.[2] Opioid poisoning education and naloxone distribution (OPEND) programs include education on the effects of opioid poisoning, how to respond to opioid poisoning including naloxone administration, and distribution of naloxone,[3,4] and are a powerful tool against the opioid poisoning crisis. However, there remain issues of access to OPEND, such as stigma and location. During the COVID-19 pandemic, the potential of remote OPEND programs to improve issues of access was demonstrated. While remote programs already existed prior to the pandemic and were shown to be effective in improving knowledge of opioids and opioid poisoning response, they have not been widely implemented as alternatives to conventional in-person OPEND programs.[5] In compiling a cohesive overview of existing remote OPEND programs and their advantages and disadvantages, we aim to support the development of future remote OPEND programs and promote them as effective solutions to the various issues of access surrounding traditional, in-person OPEND programs.
CONFLICT OF INTERESTS:	None declared.

ASSESSMENT

Problem

Is the problem a priority?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ No ○ Probably no ○ Probably yes ● Yes ○ Varies ○ Don't know	The opioid poisoning and drug toxicity crisis is a complex and multi-faceted public health epidemic with high fatality rates globally.[1] Opioid poisoning education and naloxone distribution (OPEND) programs can train and equip people to provide intervention, including naloxone administration, in case of opioid poisoning.[3,4] OPEND programs are powerful tools against the opioid poisoning	

	crisis, but are predominantly conducted in person, potentially inhibiting consistent access to those in rural and remote communities, or affected by substance use stigma.[5] Virtual OPEND programs are a potential way to reduce barriers to accessing OPEND.[5] There are no current ILCOR recommendations for virtual OPEND.	

Desirable Effects

How substantial are the desirable anticipated effects?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Trivial ○ Small ○ Moderate ○ Large ○ Varies ● Don't know	The scoping review search identified 9,167 studies for screening, of which 117 were selected for full-text screening. Forty-two studies were included in the study: 20 quasi-experimental pre-post design studies, 13 descriptive studies, 6 randomized controlled trials, 2 program evaluations, and 1 non-randomized controlled trial. Appraisal of studies was not done; thus, certainty of the presented evidence is unclear. **Knowledge, confidence, and preparedness to respond** Most studies reported an increase in the outcome of knowledge about opioids, opioid use disorder, opioid poisoning and risks, naloxone, and opioid misuse.[5–27] Berland et al. (2019)[23] noted increased preparedness to intervene in opioid poisoning. Studies also reported increases in confidence in recognizing poisoning and administering naloxone [11,17,18,25,28,29] However, many of the included studies lack longitudinal data, and thus it is not known whether increases in knowledge are sustained. The studies that do discuss knowledge levels at follow-up portray conflicting data, with Adams et al. (2020)[7] showing the knowledge increase from their virtual training sustained at 6-months, but Cerles et al. (2021)[8] showing that knowledge was not sustained at 3-month follow-up, and Bergeria et al. (2019)[19] noting a small decrease in knowledge at the 30-day mark. **Stigma** For the outcome of stigma reduction, several studies saw improvement in attitudes and decreases in stigma around opioid use disorder and opioid poisoning.[7,9,13,15,20,25,30,31] However, results were mixed, with Giordano et al. (2020)[32] noting worsened attitudes regarding opioid poisoning, and Hohmann et al. (2022)[28] and Berland et al. (2019) [14] finding no differences in attitudes toward naloxone, illicit opioid use, or prescribed opioid misuse.	

Undesirable Effects

How substantial are the undesirable anticipated effects?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS

○ Trivial ○ Small ○ Moderate ○ Large ○ Varies ● Don't know	No undesirable effects were reported in the included studies.	

Certainty of evidence

What is the overall certainty of the evidence of effects?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
● Very low ○ Low ○ Moderate ○ High ○ No included studies	The certainty of evidence was interpreted as very low. No quality appraisal was done on any of the included studies, as the review in question is a scoping review.	

Values

Is there important uncertainty about or variability in how much people value the main outcomes?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Important uncertainty or variability ○ Possibly important uncertainty or variability ○ Probably no important uncertainty or variability ● No important uncertainty or variability	There is no important uncertainty or variability in how much people value the reported upon outcomes. However, most studies reported that participants were satisfied or highly satisfied with the virtual trainings and naloxone kit distribution.[5,7,8,10,11,13–15,17–21,23–25,29,33–37]	

Balance of effects

Does the balance between desirable and undesirable effects favor the intervention or the comparison?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS

○ Favors the comparison ○ Probably favors the comparison ○ Does not favor either the intervention or the comparison ○ Probably favors the intervention ○ Favors the intervention ○ Varies ● Don't know	Due to the uncertainty of evidence, it is difficult to balance the undesirable and desirable effects in favour of the intervention or comparison.	While some prefer in-person OPEND, it is difficult to balance the benefits of the accessibility of virtual programs with qualms about online learning.

Resources required

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Large costs ○ Moderate costs ○Negligible costs and savings ● Moderate savings ○ Large savings ○ Varies ○ Don't know	While no studies explicitly discussed the costs of virtual OPEND programs, virtual education programs would likely save on costs, as they would remove the required costs associated with a dedicated space for programming. Additionally, options for asynchronous virtual learning would remove costs associated with instructors. However, programs which offer naloxone distribution will likely experience costs associated with distribution and delivery of naloxone, and medication acquisition.	

Certainty of evidence of required resources

What is the certainty of the evidence of resource requirements (costs)?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
● Very low ○ Low ○ Moderate ○ High ○ No included studies	Studies that mentioned costs associated with naloxone distribution noted it as a potential barrier to obtaining naloxone.[18,38] However, most studies did not explicitly discuss cost.	

Cost effectiveness

Does the cost-effectiveness of the intervention favor the intervention or the comparison?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS

○ Favors the comparison ○ Probably favors the comparison ○ Does not favor either the intervention or the comparison ● Probably favors the intervention ○ Favors the intervention ○ Varies ○ No included studies	Although cost effectiveness was not directly discussed in the included studies, OPEND is consistently considered a cost-effective solution against the opioid poisoning crisis.[39–42] The accessibility of virtual programs may encourage more to get trained in OPEND, further improving cost-effectiveness.	

Equity

What would be the impact on health equity?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Reduced ○ Probably reduced ○ Probably no impact ● Probably increased ○ Increased ○ Varies ○ Don't know	Those most likely to be impacted by the opioid poisoning crisis are marginalized and vulnerable populations, including people living in rural and remote areas, those experiencing homelessness or living in poverty, incarcerated individuals, and Black, Indigenous, and People of Colour. As such, virtual OPEND likely increases health equity, as it provides a more accessible option against a massive public health crisis. However, very few of the included studies reported on the characteristics listed in the Cochrane checklist for equity, PROGRESS-Plus. As most of the included studies did not report on these variables, it is difficult to conclude whether issues with representativeness occurred, potentially limiting the impacts of these interventions on health equity.	

Acceptability

Is the intervention acceptable to key stakeholders?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ No ○ Probably no ● Probably yes ○ Yes ○ Varies ○ Don't know	Most participants in the included studies were highly satisfied or satisfied and found the trainings acceptable.	

Feasibility

Is the intervention feasible to implement?

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ No ○ Probably no ● Probably yes ○ Yes	The included studies did not note any extreme implementation difficulties, other than potential preference for in person training and costs associated with naloxone distribution. Given the likely cost-	

○ Varies ○ Don't know	effectiveness of virtual training, it is likely this intervention is feasible to implement.	

SUMMARY OF JUDGEMENTS

	JUDGEMENT						
PROBLEM	No	Probably no	Probably yes	**Yes**		Varies	Don't know
DESIRABLE EFFECTS	Trivial	Small	Moderate	Large		Varies	**Don't know**
UNDESIRABLE EFFECTS	Trivial	Small	Moderate	Large		Varies	**Don't know**
CERTAINTY OF EVIDENCE	**Very low**	Low	Moderate	High			No included studies
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	Probably no important uncertainty or variability	**No important uncertainty or variability**			
BALANCE OF EFFECTS	Favors the comparison	Probably favors the comparison	Does not favor either the intervention or the comparison	Probably favors the intervention	Favors the intervention	Varies	**Don't know**
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	**Moderate savings**	Large savings	Varies	Don't know
CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	**Very low**	Low	Moderate	High			No included studies
COST EFFECTIVENESS	Favors the comparison	**Probably favors the comparison**	Does not favor either the intervention or the comparison	Probably favors the intervention	Favors the intervention	Varies	No included studies
EQUITY	Reduced	Probably reduced	Probably no impact	**Probably increased**	Increased	Varies	Don't know
ACCEPTABILITY	No	Probably no	**Probably yes**	Yes		Varies	Don't know
FEASIBILITY	No	Probably no	**Probably yes**	Yes		Varies	Don't know

TYPE OF RECOMMENDATION

Strong recommendation against the intervention	Conditional recommendation against the intervention	Conditional recommendation for either the intervention or the comparison	**Conditional recommendation for the intervention**	Strong recommendation for the intervention
○	○	○	●	○

CONCLUSIONS

CONCLUSIONS

Recommendation

Virtual and in-person opioid poisoning education and naloxone distribution programs are effective and appropriate for improving knowledge and preparedness on opioid poisoning response, especially when combined with naloxone distribution.
Virtual programs, in particular, can teach opioid poisoning response anywhere there is a need, such as rural and underserved communities, and can provide life-saving education on opioid poisoning response with or without naloxone distribution.

Justification

This topic was introduced by the FA Task Force as the opioid poisoning and drug toxicity crisis is a complex and multi-faceted public health epidemic. Opioid-related harms can affect people of all communities, ages, and socioeconomic status. Opioid poisoning education and naloxone distribution (OPEND) programs are powerful tools against the opioid poisoning crisis. These programs educate on the effects of opioid poisoning, how to respond to opioid poisoning, and stigma, as well as distribute naloxone. OPEND programs destigmatize and legitimize harm reduction measures and increase understanding of naloxone use in opioid poisoning emergencies. However, there remain several barriers to consistent OPEND program access, such as stigma and program location. Rural, remote, small, and mid-sized communities experiencing the opioid poisoning crisis face unique barriers to treatment and opioid poisoning education, such as stigma due to smaller population, and geographical issues accessing resources due to transportation difficulties, distance, and dispersed population. During the COVID-19 pandemic, health services that were previously only conducted in person were adapted to be conducted remotely and across long distances, demonstrating the potential of remote OPEND programs. While such programs existed pre-pandemic and were shown to be effective in improving knowledge of opioid poisoning response, they have not yet been implemented as alternatives to in-person OPEND programs. The FA Task force aimed to support the development of future remote OPEND programs in compiling an overview of existing remote programs.
In making this recommendation, the FA Task force considered:

- That both in-person and virtual opioid poisoning education are effective and appropriate for improving knowledge and preparedness.
- That in jurisdictions with no existing naloxone distribution program, virtual overdose prevention and response training is still effective in providing education on recognizing and responding to opioid poisoning.
- That the learnings from the included studies are useful wherever there is a need for opioid poisoning response, and that virtual opioid poisoning education and naloxone distribution is able to reach communities which would otherwise be unlikely to receive opioid poisoning education and naloxone distribution.

• In making a weak recommendation, we considered that the adolopment was conducted on a scoping review, and thus, critical appraisal of studies was not completed. However, the included studies were positive on the effects on knowledge, confidence, and preparation of virtual OPEND.

Subgroup considerations

Subgroup analysis was not possible, as the conducted review was a scoping review.

Implementation considerations

See above

Monitoring and evaluation

See above

Research priorities

- More studies are necessary to address the long-term outcomes of virtual OPEND interventions, particularly the duration of knowledge retention, and the necessity for retraining.
- More controlled studies are required. Additionally, studies with comparisons to in-person training are required.
- Studies that report more explicitly on aspects of equity, as reported in PROGRESS-Plus, as necessary.

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First Aid Interventions for Caustic Agent Attack (FA 7445)

QUESTION

First Aid Interventions for a Caustic Agent Attack in Adults and Children	
POPULATION:	Adults or children in the out of hospital setting subjected to a caustic agent attack to the skin or eye
INTERVENTION:	Any intervention immediately available to the trained or untrained first aid provider (e.g. irrigation, cold compression, washing with soap, baking soda) and duration
COMPARISON:	Any other treatment and duration, or no treatment
MAIN OUTCOMES:	Any clinical outcomes including pain relief, reduction in pain score, need for analgesia, extent of burn or tissue damage, intervention needed for burn or tissue damage, survival, adverse reaction from use of treatment (e.g. pain, erythema, allergy), and including harm to first aid providers
SETTING:	Pre-hospital
PERSPECTIVE:	First Aid providers
BACKGROUND:	The global incidence of caustic agent attacks is rising, with an estimated 10,000 cases annually worldwide ("Acid Survivors Trust International," 2025). These assaults are typically intended to cause permanent scarring, disfigurement, and long-term disability, and they are associated with profound psychological trauma and socioeconomic hardship (Burd 2010 29; Grundlingh 2017 358; Mannon 2007 159). Data from the United Kingdom highlight the public health significance of these injuries: in an 8-year review of 185 patients, chemical burns represented only about 10% of all burn cases yet were responsible for a disproportionately high share of burn-related mortality. Over a 25-year period, industrial chemical injuries declined, while domestic chemical burns increased, comprising 42% of exposures in the more recent cohort (Hardwicke 2012 383). Data regarding the optimal treatment of caustic attacks is lacking and there is a need for evidence-based guidelines on the topic.
CONFLICT OF INTERESTS:	None

ASSESSMENT

Problem Is the problem a priority?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ No ○ Probably no ○ Probably yes ● Yes ○ Varies ○ Don't know	The global incidence of caustic agent attacks, also referred to as chemical assaults, is rising, with an estimated 10,000 cases annually worldwide ("Acid Survivors Trust International," 2025). These assaults are rarely fatal but are typically intended to cause permanent scarring, disfigurement, and long-term disability, and they are frequently associated with profound psychological trauma and socioeconomic hardship (Burd 2010 29; Grundlingh 2017 358; Mannon 2007 159). Data from the United Kingdom highlight the public health significance of these injuries: in an 8-year review of 185 patients, chemical burns represented only about 10% of all burn cases	Caustic attack may disproportionally effect women and may reflect trends in intimate partner violence.

	yet were responsible for a disproportionately high share of burn-related mortality. Over a 25-year period, industrial chemical injuries declined, while domestic chemical burns increased, comprising 42% of exposures in the more recent cohort (Hardwicke 2012 383). Commonly implicated agents include nitric and sulfuric acids, sodium hydroxide, and in some regions, hydrofluoric acid, which is easily accessible through household and industrial cleaning products (Atley 2015 157; Mannan 2006 235; Milton 2010 924). 1. Acid Survivors Trust International. (2018). Retrieved November 11, 2025, from https://asti.org.uk/ 2. Burd A, Ahmed K. The acute management of acid assault burns: A pragmatic approach. Indian J Plast Surg. 2010 Jan;43(1):29-33. doi: 10.4103/0970-0358.63952. PMID: 20924446; PMCID: PMC2938618.. 3. Grundlingh J, Payne J, Hassan T. Attacks with corrosive substances are increasing in UK. BMJ. 2017 Aug 2;358:j3640. doi: 10.1136/bmj.j3640. PMID: 28768634. 4. Mannan A, Ghani S, Clarke A, Butler PE. Cases of chemical assault worldwide: a literature review. Burns. 2007 Mar;33(2):149-54. doi: 10.1016/j.burns.2006.05.002. Epub 2006 Nov 13. PMID: 17095164. 5. Hardwicke J, Hunter T, Staruch R, Moiemen N. Chemical burns--an historical comparison and review of the literature. Burns. 2012 May;38(3):383-7. doi: 10.1016/j.burns.2011.09.014. Epub 2011 Oct 28. PMID: 22037150. 6. Atley K, Ridyard E. Treatment of hydrofluoric acid exposure to the eye. Int J Ophthalmol. 2015 Feb 18;8(1):157-61. doi: 10.3980/j.issn.2222-	

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Desirable Effects How substantial are the desirable anticipated effects?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Trivial ○ Small ● Moderate ○ Large ○ Varies ○ Don't know	A prospective cohort from Das et al. (2015) observational evidence that first aid water irrigation reduces burn depth and subsequent scarring in victims of acid assault (Das 2015 484). Among 126 patients with acid burns, those who received immediate water irrigation (n=93) had significantly lower rates of hypertrophic scarring (11.4% vs 48.5%) with a relative risk of 0.24 (95% CI 0.13–0.47). Water-irrigated patients more frequently presented with superficial or superficial partial-thickness injuries, requiring fewer surgical interventions. A controlled porcine skin model (Matar 2024 1968) demonstrated that water-based decontamination (wet or combined dry-then-wet) performed within 10 seconds of acid exposure improved receptor chamber pH and reduced sulfur content. A case series by Kessel in 2015 describes severe ammonium hydroxide ocular injuries among 13 patients (Kessel 2015 e230). Although saline irrigation was used initially, the authors did not evaluate its effectiveness relative to other treatments. Outcomes appeared primarily driven by initial injury severity; many eyes progressed to evisceration or phthisis.	

	1. Das KK, Olga L, Peck M, et al. Management of acid burns: experience from Bangladesh. Burns. 2015 May;41(3):484-92. doi: 10.1016/j.burns.2014.08.003.2. 2. Kessel L, Lindegaard J, Boberg-Ans G, et al. Assault cases involving ammoniumhydroxide - a series of 19 eye alkali eye injuries. Acta Ophthalmol. 2015 May;93(3):e230-1. doi: 10.1111/aos.12539. 3. Matar H, Vuddanda PR, Chilcott RP. Evaluation of emergency skin decontamination protocols in response to an acid attack (vitreolage). Burns. 2024;50(8):1968-1976. doi:10.1016/j.burns.2024.07.003	
Undesirable Effects How substantial are the undesirable anticipated effects?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Large ○ Moderate ○ Small ● Trivial ○ Varies ○ Don't know	A prospective cohort from Das et al. (2015) observational evidence that first aid water irrigation reduces burn depth and subsequent scarring in victims of acid assault (Das 2015 484). Among 126 patients with acid burns, those who received immediate water irrigation (n=93) had significantly lower rates of hypertrophic scarring (11.4% vs 48.5%) with a relative risk of 0.24 (95% CI 0.13–0.47). However, irrigation did not eliminate the risk of scaring. Similarly in a controlled porcine skin model (Matar 2024 1968) early decontamination performed within 10 seconds of acid exposure improved receptor chamber pH and reduced sulfur content. However, delayed irrigation (>30 seconds) resulted in loss of benefit, reflecting the extremely narrow window before irreversible tissue damage occurs. Several case reports and case series (Kadivar 1991 171; Satbir 2025 11; D'Alessandro 2020 e123; Leung 2015 223) document irrigation as either a first aid measure or initial hospital treatment but in these cases irrigation did not fully eliminate the risk of scaring. 1. D'Alessandro AD, Sikon JR, Lacy AJ, et al. Vitriolage by	Irrigation appears important in reducing the risk of injury, including scaring, but may not totally remove the risk. Immediate irrigation appears essential as injury can rapidly occur.

		Sulfuric Acid: Unique Challenges and Considerations in Patient Resuscitation. J Emerg Med. 2020 Oct;59(4):e123-e126. doi: 10.1016/j.jemermed.2020.06.038 . 2. Das KK, Olga L, Peck M, et al. Management of acid burns: experience from Bangladesh. Burns. 2015 May;41(3):484-92. doi: 10.1016/j.burns.2014.08.003. 3. Kadivar H, Adams SC. Treatment of chemical and biological warfare injuries: insights derived from the 1984 Iraqi attack on Majnoon Island. Mil Med. 1991 Apr;156(4):171-7. 4. Leung BC, Burd A. A case of chemical assault in Hong Kong (case report). Int J Surg Case Rep. 2015;10:223-7. doi: 10.1016/j.ijscr.2015.03.059. 5. Matar H, Vuddanda PR, Chilcott RP. Evaluation of emergency skin decontamination protocols in response to an acid attack (vitreolage). Burns. 2024;50(8):1968-1976. doi:10.1016/j.burns.2024.07.003 6. Satbir SG, Fatimah MJ, Ahmad SH, et al. Unmasking the silent threat: deep tissue impacts of chemical burns – a case report. Burns Open. 2025;11:100412. doi.org/10.1016/j.burnso.2025.100412.	
Certainty of evidence What is the overall certainty of the evidence of effects?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**

○ Very low ● Low ○ Moderate ○ High ○ No included studies	Overall evidence is based on observational cohort studies, case series/reports and animal studies.	
Values Is there important uncertainty about or variability in how much people value the main outcomes?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Important uncertainty or variability ○ Possibly important uncertainty or variability ● Probably no important uncertainty or variability ○ No important uncertainty or variability	No direct studies available.	Permanent scarring, disfigurement, and long-term disability, is associated with psychological trauma and socioeconomic hardship in these individuals (Burd 2010 29; Grundlingh 2017 358; Mannon 2007 159). It is reasonable to assume that people would value treatments that would limit these morbidities. 1. Burd A, Ahmed K. The acute management of acid assault burns: A pragmatic approach. Indian J Plast Surg. 2010 Jan;43(1):29-33. doi: 10.4103/0970-0358.63952. PMID: 20924446; PMCID: PMC2938618. 2. Grundlingh J, Payne J, Hassan T. Attacks with corrosive substances are increasing in UK. BMJ. 2017 Aug 2;358:j3640. doi: 10.1136/bmj.j3640. PMID: 28768634. 3. Mannan A, Ghani S, Clarke A, White P, Salmanta S, Butler PE. Psychosocial outcomes derived from an acid burned population in Bangladesh, and comparison with Western norms. Burns. 2006 Mar;32(2):235-41. doi: 10.1016/j.burns.2005.08.027. Epub 2006 Jan 31. PMID: 16448773.
Balance of effects Does the balance between desirable and undesirable effects favor the intervention or the comparison?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**

○ Favors the comparison ○ Probably favors the comparison ○ Does not favor either the intervention or the comparison ○ Probably favors the intervention ● Favors the intervention ○ Varies ○ Don't know	No direct evidence is available to compare the desirable and undesirable effects of the intervention. However, immediate irrigation with water or saline appears to result in a decreased severity of chemical burns with no reported side effects.	

Resources required How large are the resource requirements (costs)?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Large costs ○ Moderate costs ● Negligible costs and savings ○ Moderate savings ○ Large savings ○ Varies ○ Don't know	No available studies	Water is an available resource in most areas. Typically, this is of negligible cost. There may be some resource limited areas in which water is of higher cost or unavailable. In these areas saline is also an option for irrigation.

Certainty of evidence of required resources What is the certainty of the evidence of resource requirements (costs)?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Very low ○ Low ○ Moderate ○ High ● No included studies	No available studies	

Cost effectiveness Does the cost-effectiveness of the intervention favor the intervention or the comparison?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**

○ Favors the comparison ○ Probably favors the comparison ○ Does not favor either the intervention or the comparison ● Probably favors the intervention ○ Favors the intervention ○ Varies ○ No included studies	No available studies	Water and saline would vary in cost and availability by geographical region, with water likely being more readily available than saline in most instances. The cost of water in most areas is likely negligible. Saline may be more available in some hospital settings.
Equity What would be the impact on health equity?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Reduced ○ Probably reduced ● Probably no impact ○ Probably increased ○ Increased ○ Varies ○ Don't know	Water is likely the most available decontamination substance worldwide. Some individuals or hospitals may have more access to physiologic solution/normal saline. Evidence pertaining to specialized irrigation solutions (Diphoterine®) is limited coming from a single study, but suggested improved outcomes in ocular alkali injuries (Merle 2005 205). While there may be some benefit of commercial agents, such as Diphoterine®, over other irrigation media in some instances or for some chemicals, these agents may not be readily available to most individuals and recommending such substances may increase health disparities. 1. Merle H, Donnio A, Ayeboua L, et al. Alkali ocular burns in Martinique (French West Indies) Evaluation of the use of an amphoteric solution as the rinsing product. Burns. 2005;31(2):205-211. doi:10.1016/j.burns.2004.09.001	Water is likely the most available decontamination substance worldwide. Recommending water as the primary decontamination solution would likely not impact health equity.
Acceptability Is the intervention acceptable to key stakeholders?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ No ○ Probably no ○ Probably yes ● Yes	No available studies	Water or saline irrigation are likely all acceptable interventions to key stakeholders.

○ Varies ○ Don't know		

Feasibility Is the intervention feasible to implement?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ No ○ Probably no ● Probably yes ○ Yes ○ Varies ○ Don't know	No available studies	Water is likely to be the least costly and most readily available intervention worldwide. However, water may not always be available in some resource limited settings. In these cases saline is an acceptable alternative for irrigation.

SUMMARY OF JUDGEMENTS

	JUDGEMENT						
PROBLEM	No	Probably no	Probably yes	**Yes**		Varies	Don't know
DESIRABLE EFFECTS	Trivial	Small	**Moderate**	Large		Varies	Don't know
UNDESIRABLE EFFECTS	Large	Moderate	Small	**Trivial**		Varies	Don't know
CERTAINTY OF EVIDENCE	Very low	**Low**	Moderate	High			No included studies
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	**Probably no important uncertainty or variability**	No important uncertainty or variability			
BALANCE OF EFFECTS	Favors the comparison	Probably favors the comparison	Does not favor either the intervention or the comparison	Probably favors the intervention	**Favors the intervention**	Varies	Don't know
RESOURCES REQUIRED	Large costs	Moderate costs	**Negligible costs and savings**	Moderate savings	Large savings	Varies	Don't know
CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	Very low	Low	Moderate	High			**No included studies**
COST EFFECTIVENESS	Favors the comparison	Probably favors the comparison	Does not favor either the intervention or the comparison	Probably favors the intervention	**Favors the intervention**	Varies	No included studies
EQUITY	Reduced	Probably reduced	**Probably no impact**	Probably increased	Increased	Varies	Don't know
ACCEPTABILITY	No	Probably no	Probably yes	**Yes**		Varies	Don't know
FEASIBILITY	No	Probably no	**Probably yes**	Yes		Varies	Don't know

TYPE OF RECOMMENDATION

Strong recommendation against the intervention	Conditional recommendation against the intervention	Conditional recommendation for either the intervention or the comparison	Conditional recommendation for the intervention	Strong recommendation for the intervention
○	○	○	●	○

CONCLUSIONS

Good Practice Statement

Following a caustic attack, immediately irrigate the injured person's affected area with copious amounts of water or saline.

Justification

In making these recommendations, the FA Task Force considered the following:

- This topic was prioritized by the FA Task Force based on the global morbidity that caustic attacks cause throughout the world.
- The Task Force discussed that these is a lack of available evidence-based recommendations for the treatment of caustic attack and acknowledges that the lack of such recommendations may lead to the improper first aid treatment, including decontamination, of the individual.
- Immediate irrigation is of primarily importance. Both human and animal data suggest that immediate irrigation is associated with improved outcomes.
- The Task Force believes that water is likely the most available decontamination substance worldwide. However, some individuals or hospitals may have more access to physiologic solution/normal saline.
- While there may be some benefit of commercial agents, such as Diphoterine®, over other irrigation media in some instances or for some chemicals, these agents may not be readily available to most individuals and recommending such substances may increase health disparities.
- Little data is available regarding the efficacy for removal of contaminated clothing. However, clothing, shoes, and jewelry that are saturated with corrosive substances can retain and continue to deliver the chemical to the skin, deepening tissue injury and extending exposure time. Therefore, contaminated items should be carefully removed as soon as possible, ideally while ensuring that individuals avoid secondary contamination.
- No studies assess the benefit of contact lens removal from the eyes following caustic exposure. However, similar to clothing removal, the prompt removal of contact lenses is expected to decrease the chemical contact with the eye.

References

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2. Burd A, Ahmed K. The acute management of acid assault burns: A pragmatic approach. Indian J Plast Surg. 2010 Jan;43(1):29-33. doi: 10.4103/0970-0358.63952. PMID: 20924446; PMCID: PMC2938618..

3. Grundlingh J, Payne J, Hassan T. Attacks with corrosive substances are increasing in UK. BMJ. 2017 Aug 2;358:j3640. doi: 10.1136/bmj.j3640. PMID: 28768634.
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Single-stage Concussion Scoring Systems in the First Aid Setting (FA 7341)

QUESTION

Simple single-stage concussion scoring system(s) in the first aid setting: a scoping review	
POPULATION:	Adults and children with suspected head injury.
INTERVENTION:	Use of concussion triage recognition tool.
COMPARISON:	Use of a standard first aid assessment without a scoring system or triage tool.
MAIN OUTCOMES:	Any clinical outcomes (detection/recognition outcomes as proxies).
SETTING:	Out-of-hospital or hospital-based strategies feasible by a provider of first aid.
PERSPECTIVE:	Adults or children with a mild traumatic brain injury (mTBI).
BACKGROUND:	In the past ten years, there has been a resurgence globally related to early recognition, management (including removal from activity), and prevention of concussions, led mainly through the sports world. International summary, agreement, and consensus statements related to sport-related concussion have dramatically evolved over the past 20 years and now assist in guiding current clinical practice (Schneider 2022 615) for healthcare providers, but not necessarily for non-trained, non-healthcare providers (i.e., lay responders). Common causes include motor vehicle collisions, falls, sports injuries, and bicycle accidents. Risk factors include drinking alcohol. The mechanism may involve either a direct blow to the head or forces transmitted from elsewhere on the body to the head. Either mechanism may result in neuron dysfunction, as there are increased glucose requirements but insufficient blood supply. In June 2023, the *British Journal of Sports Medicine* published The Amsterdam 2022 International Consensus Statement on Concussion in Sport (Patricios 2023 695) (and its associated works), which summarizes published evidence at the conference on concussions in sport. The Concussion in Sport Group revised several concussion assessment tools for healthcare providers (non-lay providers), including the Concussion Recognition Tool-6 (CRT6) and Sport Concussion Assessment Tool-6 (SCAT6, Child SCAT6), as well as a new tool, the Sport Concussion Office Assessment Tool-6 (SCOAT6, Child SCOAT6). In situations where a medically trained and licensed healthcare provider is present, any person suspected of having a concussion should be stopped from activity or play and assessed using a standardized approach. Several concussion assessment tools have been developed, and in some settings, these assessment tools are required to manage a concussed person. These standardized measures, acquired from the assessment tools, are intended to reduce the subjectivity encountered by healthcare providers responsible for making rapid and accurate injury assessment and concussion diagnosis decisions. The assessment examination date should be compared to a reliable pre-injury baseline.
CONFLICT OF INTERESTS:	None declared.

ASSESSMENT

Problem Is the problem a priority?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ No ○ Probably no	Concussions are estimated to affect more than 6 out of every 1,000 people each year (Cassidy 2004, 28) and	

○ Probably yes ● Yes ○ Varies ○ Don't know	are the most common type of TBI (Cassidy 2004 28; Voss 2015, 32). Annually, there are over 300,000 sports-related TBIs in the United States, with most being concussions and representing between 9%-13% of all high school athletic injuries (Gardner 2019 768). Concussions are estimated to affect more than 6 per 1,000 people yearly (Cassidy 2004 28). It is the most common type of TBI. Males and young adults are the most affected. Outcomes are generally good. Another concussion before the symptoms of a prior concussion have resolved is associated with worse outcomes. Repeated concussions may also increase the risk in later life of chronic traumatic encephalopathy, Parkinson's disease and depression, and behavior issues in children (Fujiwara 2014 79)	
Desirable Effects How substantial are the desirable anticipated effects?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Trivial ○ Small ● Moderate ○ Large ○ Varies ○ Don't know	A review by Guskiewicz and Broglio (2011 603) emphasized that systematic management of sports-related concussions (SRCs) is essential for athlete safety. They recommend individualized approaches using baseline data and advocate for caution, adhering to the principle "When in doubt, sit them out." McCrory et al. (2012 268) highlighted the challenges in diagnosing SRCs, lacking definitive tools, and called for a comprehensive diagnostic framework that includes sideline assessments and observation. Athletes showing clear physical or cognitive signs of injury must be removed from play for evaluation, as symptoms often peak within 24–48 hours and may resolve over days to weeks. McLeod and Jhala (2022 40) noted that SRC can arise from various forms of trauma, and recognizing subtle signs is vital, particularly in amateur sports with limited medical access. Immediate removal from play is recommended for any evident signs of concussion, aligning with the principle "If in doubt, sit them out." Various guidelines underscore the importance of healthcare professionals in recognizing and managing concussions. Organizations like the European Resuscitation Council (Zideman 2021 270) and ANZCOR (ANZCOR Guidelines 2024) advocate for immediate evaluation and the "recognize, remove, refer" approach, utilizing tools like SCAT5 and CRT5 for screening, but stressing the need for thorough clinical assessments.	

	Three observational studies highlighted innovative tools for managing pediatric concussion. Clarke et al (2020 595) found that the HeadCheck app increased parental awareness of concussion recovery. McDonald et al. (2021 104) reported high follow-up adherence after a triage protocol, while Hall et al (2021 A89) demonstrated a triage screening tool's effectiveness in clinical settings. These studies underscore the need for accessible tools to enhance recognition and management of pediatric concussions.	
Undesirable Effects How substantial are the undesirable anticipated effects?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Large ○ Moderate ○ Small ● Trivial ○ Varies ○ Don't know	The undesirable effects are minimal and manageable compared to the high risk of depression and deconditioning associated with prolonged strict rest, but this varies with severity of injury and personal characteristics.	
Certainty of evidence What is the overall certainty of the evidence of effects?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
● Very low ○ Low ○ Moderate ○ High ○ No included studies	This scoping review did not identify any direct evidence for a concussion triage recognition tool that could be used as a one-time scoring system by lay first aid responders with little to no training in out-of-hospital settings. The task force scoping review team found no randomized controlled studies during their initial search that specifically addressed this issue. Additionally, the team highlighted the complex nature of concussion symptoms, which can include memory impairment, attentional deficits, balance disturbances, and headaches. The first aid task force acknowledged that recognizing a concussion is challenging due to its varied symptoms and the absence of a validated triage recognition tool that lay first aid responders can easily use.	
Values Is there important uncertainty about or variability in how much people value the main outcomes?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Important uncertainty or variability ○ Possibly important uncertainty or variability ○ Probably no important uncertainty or variability ● No important uncertainty or variability	Most of the people would value the use of a single stage concussion triage recognition tool. Many people would prefer survival rather than long term brain injury or death.	
Balance of effects Does the balance between desirable and undesirable effects favor the intervention or the comparison?		

JUDGEMENT	RESEARCH EVIDENCE	ADDITIONAL CONSIDERATIONS
○ Favors the comparison ○ Probably favors the comparison ○ Does not favor either the intervention or the comparison ○ Probably favors the intervention ● Favors the intervention ○ Varies ○ Don't know	No direct evidence regarding a concussion triage recognition tool that can be used as a one-time scoring tool by lay first aid responders requiring little to no training in the out-of-hospital setting.	
Resources required How large are the resource requirements (costs)?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Large costs ○ Moderate costs ○ Negligible costs and savings ○ Moderate savings ○ Large savings ● Varies ○ Don't know	To use a single stage concussion triage recognition tool, the cost would focus on education to teach first aid responders to utilizing a three-question screening process. 1. Did a potential injury occur? 2. Was the mechanism associated with a potential head injury? 3. Was there any altered mental status?	Educational efforts must address the importance of initial assessment based on observed mechanisms of injury (or self-reported), overt signs, and self-reported symptoms. Initial examination prioritizes ruling out life-threatening conditions such as severe bleeding or spinal injuries.
Certainty of evidence of required resources What is the certainty of the evidence of resource requirements (costs)?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Very low ○ Low ○ Moderate ○ High ● No included studies	There were no included studies on the costs of the single-stage concussion triage recognition tool in the first aid setting for recognizing concussions.	Human resources and printed materials are the main requirements in educating men about the use of a single-stage concussion triage recognition tool.
Cost effectiveness Does the cost-effectiveness of the intervention favor the intervention or the comparison?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Favors the comparison ○ Probably favors the comparison ○ Does not favor either the intervention or the comparison ● Probably favors the intervention ○ Favors the intervention ○ Varies ○ No included studies	There were no included studies investigating the cost-effectiveness of the single-stage concussion triage recognition tool in the first aid setting for recognizing concussions.	Considering the benefits of educational interventions to increase the identification of concussions in the first aid setting is likely cost-effective.

Equity What would be the impact on health equity?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ Reduced ● Probably reduced ○ Probably no impact ○ Probably increased ○ Increased ○ Varies ○ Don't know	An additional requirement of human resources and printed materials for educational would potentially decrease health equity. Requirement of training on the single-stage concussion triage recognition tool in the first aid setting for recognizing concussions would also increase the cost. Characteristics like socioeconomic status, ethnicity, and education level are rarely addressed in studies, leaving gaps in understanding how these factors influence concussion recognition, triage, and outcomes.	
Acceptability Is the intervention acceptable to key stakeholders?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ No ○ Probably no ○ Probably yes ● Yes ○ Varies ○ Don't know	Most of the stakeholders would accept the use of a simple, single-stage concussion triage recognition tool in the first aid setting for recognizing concussions, utilizing a three-question screening process. 1. Did a potential injury occur? 2. Was the mechanism associated with a potential head injury?	
Feasibility Is the intervention feasible to implement?		
JUDGEMENT	**RESEARCH EVIDENCE**	**ADDITIONAL CONSIDERATIONS**
○ No ○ Probably no ● Probably yes ○ Yes ○ Varies ○ Don't know	No feasibility issues.	

SUMMARY OF JUDGEMENTS

	JUDGEMENT						
PROBLEM	No	Probably no	Probably yes	**Yes**		Varies	Don't know
DESIRABLE EFFECTS	Trivial	Small	**Moderate**	Large		Varies	Don't know
UNDESIRABLE EFFECTS	Large	Moderate	Small	**Trivial**		Varies	Don't know
CERTAINTY OF EVIDENCE	**Very low**	Low	Moderate	High			No included studies
VALUES	Important uncertainty or variability	Possibly important uncertainty or variability	Probably no important uncertainty or variability	**No important uncertainty or variability**			

BALANCE OF EFFECTS	Favors the comparison	Probably favors the comparison	Does not favor either the intervention or the comparison	Probably favors the intervention	**Favors the intervention**	Varies	Don't know
RESOURCES REQUIRED	Large costs	Moderate costs	Negligible costs and savings	Moderate savings	Large savings	**Varies**	Don't know
CERTAINTY OF EVIDENCE OF REQUIRED RESOURCES	Very low	Low	Moderate	High			**No included studies**
COST EFFECTIVENESS	Favors the comparison	Probably favors the comparison	Does not favor either the intervention or the comparison	**Probably favors the intervention**	Favors the intervention	Varies	No included studies
EQUITY	Reduced	**Probably reduced**	Probably no impact	Probably increased	Increased	Varies	Don't know
ACCEPTABILITY	No	Probably no	Probably yes	**Yes**		Varies	Don't know
FEASIBILITY	No	Probably no	**Probably yes**	Yes		Varies	Don't know

TYPE OF RECOMMENDATION

Strong recommendation against the intervention	Conditional recommendation against the intervention	Conditional recommendation for either the intervention or the comparison	Conditional recommendation for the intervention	Strong recommendation for the intervention
○	○	○	●	○

CONCLUSIO

Good Practice Statement

Considering the evidence reviewed and based on the first aid task force consensus of expert opinion, the following good practice statements are made:

When attempting to determine if a concussion has occurred, non-medically trained, non-healthcare providers (i.e., lay first aid responders) may consider utilizing a three-question screening process.

1. Did a potential injury occur?
2. Was the mechanism associated with a potential head injury?
3. Was there any altered mental status?

*If the answer to all three questions is "yes," the existing literature suggests that these individuals be removed from the activity and EMS be **activated, or the patient be referred** to a qualified healthcare professional.*

Since concussion symptoms vary, first aid responders who are unsure if a concussion occurred may consider removing the individual from the activity until **a qualified healthcare professional can evaluate them**.

Justification

In making this good practice statement, the first aid task force agreed that recognition of a concussion is complicated by its variable symptomatology and the lack of a validated concussion triage recognition tool that can be used as a one-time scoring tool by lay first aid responders. Rather, signs and self-reported symptoms will fall into THINKING AND REMEMBERING, PHYSICAL, EMOTIONAL, and BEHAVIORAL (See Appendix). Symptoms may evolve rapidly (within seconds to minutes) or develop over hours, with acute symptoms such as dizziness and nausea presenting early, while irritability and sleep disturbances emerge later.

The task force agrees that altered mental status (AMS) refers to a significant change in a person's level of consciousness, cognition, or behavior. It can manifest as a range of symptoms, including confusion, disorientation, lethargy, agitation, delirium, difficulty concentrating, slurred speech, and altered sleep patterns.

The task force scoping review team noted the "recognize," "remove," and "refer" approach underscores the need for immediate removal from activity and referral to appropriate medical care when a concussion is suspected.

The task force scoping review team agrees that educational efforts must address the importance of initial assessment based on observed mechanisms of injury (or self-reported), overt signs, and self-reported symptoms. Initial examination prioritizes ruling out life-threatening conditions such as severe bleeding or spinal injuries.

Subgroup considerations

Characteristics like socioeconomic status, ethnicity, and education level are rarely addressed in studies, leaving gaps in understanding how these factors influence concussion recognition, triage, and outcomes.

Implementation considerations

Implementation of a single-stage concussion triage recognition tool in patients with suspected concussion requires education of the public and first aid providers with no medical training. The preparedness of using a A one-time scoring tool for lay first aid responders, who require little to no training in the out-of-hospital setting, necessitates funding from stakeholders, especially in institutions with high-risk patients.

Research priorities

While tools like the HeadCheck app and triage protocols for children exist, more research is needed to validate their effectiveness in diverse pediatric populations and to understand how age-related differences affect concussion symptom presentation and recovery.

While apps like the HeadCheck app show promise, the potential of digital tools, AI, and wearable technology for concussion triage and recognition still needs to be explored.

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