

# AMERICAN RED CROSS SCIENTIFIC ADVISORY COUNCIL SCIENTIFIC REVIEW

# First Aid Kit Content Design

### QUESTIONS TO BE ADDRESSED:

What items are recommended first aid items for a single patient first aid kit?

#### INTRODUCTION/OVERVIEW:

A properly stocked first aid kit is an essential piece of equipment for emergency response, whether at work, home, recreation or an athletic event (American Red Cross, n.d., 2005; National Football League, 2003) (Miller and Berry, 2016). People with first aid training are more likely to have a first aid kit (Arbon, Hayes, & Woodman, 2011) leaving training organizations with a responsibility to identify what first aid materials are most valuable. From a public health or occupational perspective, first aid kits that are accessible and properly stocked serve as resources for emergencies (Feickert, Verma, Plaschka, & Dev, 2006; Ferrer-Roca et al., 2002; Gunderson & Helikson, 2011). In addition, first aid kits should be checked regularly for expiration dates on items; kept out of the reach of young children and in an acceptable temperature range.

As first aid emergencies differ based on context or a particular environment, recommending items to be placed in a first aid kit can be based on epidemiological evidence but must also be modifiable based on its intended use. Previous Scientific Reviews have examined epidemiological evidence to support a common list of items that meet many potential needs of a person providing first aid in a variety of settings (i.e., workplace and home). It also has provided consumers with considerations to adjust and modify a basic kit. This Scientific Review will discuss the epidemiology of overdoses, particularly opioid overdoses.

First aid kits are often recommended for general population use, as well as disaster preparedness kits and high-risk environments/activities (ex., sports, outdoor recreation, remote work and travel). The activity of purchasing or making first aid kits lends to educating individuals and groups. Incorporation of kit development, storage, and use should be a part of first aid education and a contextual conversation for instructors with learners (Campbell et al., 2001; Symonette, 2014).

Prior to the 2018 review, only limited information or rationale could be found for current industry standards, set by ANSI, which is comprised of manufacturers of first aid kits, as to the criterion for first aid kit content and for locating those kits. The same exists for this review. The reality is that first aid kits cannot contain every product used in an emergency, but rather should contain those that cannot be easily improvised (i.e., sterile dressings), limit the spread of pathogens, and assist in stabilizing an ill/injured person until advanced medical care can be accessed/promote self-recovery (International Federation of Red Cross Red Crescent Societies, 2016).

# REVIEW PROCESS & LITERATURE SEARCH OF EVIDENCE SINCE LAST APPROVAL PERFORMED:

**Key Words Used** 

Pubmed.gov: "First Aid Kits"

**Inclusion Criteria** (time period, type of articles & journals, language, methodology)

Hand Search 2021-2023: scoping review of injuries and illness and the equipment needed to manage nonfatal injuries and illness in an emergency first aid setting.

English, 06-01-2021 to 12-31-2023

**Exclusion Criteria** (only human studies, foreign language, etc.) Foreign language

**Databases Searched & Additional Methods Used** (references of articles, texts, contact with authors, etc.)

Hand and single citation searches were conducted for data from:

- National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey
- Web-based Injury Statistics Query and Reporting System (WISQARSTM)
   examining latest year; <a href="https://www.cdc.gov/injury/wisgars/index.html">https://www.cdc.gov/injury/wisgars/index.html</a>
- United States Department of Labor, Bureau of Labor Statistics
- American National Standards Institute, Inc.

Pubmed.gov

#### **SCIENTIFIC FOUNDATION:**

First aid interventions and resources utilized vary depending on the severity of the injury, number of victims involved, and the level of training of the responder. Data from the National Center for Health Statistics, National Hospital, Ambulatory Medical Care, Survey found the top 10 primary doctor diagnosis at emergency department visits by year, 2016–2021 shows no change in the rankings of the top 10 diagnosis.

Based on the patient's own words and coded according to Schneider D, Appleton L, McLemore T, the reasons for patient visit for ambulatory care demonstrated consisted reporting for the primary reasons for visiting and emergency department. The rankings, while generally consistent, did move up or down some years, but generally only one position. {National Center for Health Statistics. Emergency Department Visits in the United States, 2016-2021. Generated interactively: January 2, 2024, from <a href="https://www.cdc.gov/nchs/dhcs/ed-visits/index.htm">https://www.cdc.gov/nchs/dhcs/ed-visits/index.htm</a>}

The National Hospital Ambulatory Medical Care Survey provides socioeconomic data related to ambulatory care services. {National Center for Health Statistics. Ambulatory Health Care Data 2021. NHAMCS Emergency Department Summary Tables [PDF – 831 KB]. Last

Reviewed: October 13, 2023 from <a href="https://www.cdc.gov/nchs/data/nhamcs/web\_tables/2021-nhamcs-ed-web-tables-508.pdf">https://www.cdc.gov/nchs/data/nhamcs/web\_tables/2021-nhamcs-ed-web-tables-508.pdf</a>

# **Web-based Injury Statistics Query and Reporting System**

When comparing 2018 to the most recent 2021 WISQARS data on the leading causes nonfatal injury Emergency Department visits, United States All Cases, Both Sexes, All Races, All Ages, unintentional fall (ranked 1) and unintentional, struck by against (rank 2) remain the top two leading causes of non-fatal emergency department visits. Of the remaining eight causes of nonfatal emergency department visits, seven, while ranked differently compared to 2018 are still causes of non-fatal emergency department visits. New to 2021, ranking 10th included, unintentional foreign body causes.

Consistent with past triennial reviews, the non-fatal emergency department visits classified by WISQARS appear to be treatable (based on the classification name) by first aid providers using the equipment outlined in the First Aid Kit recommendations. {Centers for Disease Control. National Electronic Injury Surveillance System-All Injury Program for WISQARS Nonfatal data, an estimated number of hospital visits for injury care that start in an emergency department based on a U.S. nationally representative probability sample of hospitals.}

#### United States Department of Labor, Bureau of Labor Statistics

Employer-Reported Workplace Injuries and Illnesses, 2021-2022 provided by the U.S. Bureau of Labor Statistics demonstrated 2,246,900 nonfatal occupational injuries and illnesses involving days away from work (DAFW).

The following dataset outlines the nonfatal occupational injuries and illnesses reported for all events and exposures:

- 1. Sprains, stains, tear (547,980)
- 2. Fractures, (149,090)
- 3. Cuts lacerations (141,450)
- 4. Puncture (expect gum shot wounds) (37,230)
- 5. Heat (thermal) burns (25,430)
- 6. Chemical burns and corrosions (7,480)
- 7. Amputations (10,840)

Multiple traumatic injuries with sprains account for 4,700 nonfatal occupational injuries and illnesses, followed by 21,700 multiple traumatic injuries with fractures. 136,300 sprains, strains, and tears, and 80,280 fractures occurred due to falls, slips, trips.

Employer-Reported Workplace Injuries and Illnesses, 2021-2022 provided by the U.S. Bureau of Labor Statistics demonstrated 3,379,220 nonfatal occupational injuries and illnesses involving days away from work, restricted activity, or job transfer (DART). The following dataset outlines the nonfatal occupational injuries and illnesses reported for all events and exposures:

- 1. Sprains, stains, tear (1,055,410)
- 2. Fractures, (192,240)
- 3. Cuts lacerations (249,490)
- 4. Puncture (expect gum shot wounds) (57,210)
- 5. Heat (thermal) burns (35,020)
- 6. Chemical burns and corrosions (10,230)
- 7. Amputations (12,560)

Multiple traumatic injuries with sprains account for 5,380 nonfatal occupational injuries and illnesses, followed by 38,390 multiple traumatic injuries with fractures. 674,100 sprains, stains, tears, and 229,200 fractures occurred due to falls, slips, trips. Data suggests first aid kit design for nonfatal occupational injuries and illnesses should be focused on managing musculoskeletal injuries, bleeding control, and thermal and chemical burns. {U.S. Bureau Of Labor Statistics. Employer-Reported Workplace Injuries and Illnesses, 2021-2022. Last Modified Date: November 09, 2023 from <a href="https://www.bls.gov/news.release/osh.nr0.htm">https://www.bls.gov/news.release/osh.nr0.htm</a>}{U.S. Bureau Of Labor Statistics. R31. Detailed event or exposure by selected natures Last Modified Date: November 09, 2023 from <a href="https://www.bls.gov/iif/nonfatal-injuries-and-illnesses-tables/case-and-demographic-characteristics-table-r31-2021-2022.xlsx">https://www.bls.gov/iif/nonfatal-injuries-and-illnesses-table-r31-2021-2022.xlsx</a>}

In 2022, the *American National Standards Institute, Inc* updated ANSI/ISEA Z308.1-2021, "American National Standard for Minimum Requirements for Workplace, First Aid Kits and Supplies." (ANSI 2022).

This addition retains the classifications (Class A and B) established in 2015 and includes several notable updates:

- Foil blankets (Class A and B): This was considered based on an assessment of similar international standards, and recognition of the multiple purposes, that the item can serve during treatment of workplace injury and illness.
- Tourniquet: more specificity has been included for tourniquets to distinguish those from similar bands you used to draw blood which are not effective in providing for loss as intended.

The appendix includes greater guidance on separately package with any control kits. The standards also include more robust discussion to assist the employer in assessing risk, identifying potential hazards, and sliding additional first aid supplies relevant to a particular application for work environment.

The revision was prepared by a task group of industry stakeholders who are recognize leaders in the research and development of first aid treatment items and training, included in the task force group was the American Red Cross.

Minimum First Kit Requirements [ANSI/ISEA standard, Z308.1-2021]

Table 1. Classes of First Aid Kits and Required Supplies					
First Aid Supply	Minimum Quantity		Minimum Size or Volume		
	Class A Kits	Class B Kits	(US)	(metric)	
Adhesive Bandage	16	50	1 x 3 in.	2.5 x 7.5 cm	
Adhesive Tape	1	2	2.5 yd (total)	2.3 m	
Antibiotic Application	10	25	1/57 oz	0.5 g	
Antiseptic	10	50	1/57 oz	0.5 g	
Breathing Barrier	1	1	N/A	N/A	
Burn Dressing (gel soaked)	1	2	4 x 4 in.	10 x 10 cm	
Burn Treatment	10	25	1/32 oz	0.9 g	
Cold Pack	1	2	4 x 5 in.	10 x 12.5 cm	
Eye Covering, with means of attachment	2	2	2.9 sq. in.	19 sq. cm	
Fue /Skin Week	1	0	1 fl oz total	29.6 ml	
Eye/Skin Wash	0	1	4 fl. oz total	118.3 ml	
Foil Blanket	1	1	52 x 84 in.	132 x 213 cm	
First Aid Guide	1	1	N/A	N/A	
Hand Sanitizer	10	20	1/32 oz	0.9 g	
Medical Exam Gloves	2 pair	4 pair	N/A	N/A	
Dollar Bandaga	1	2	2 in. x 4 yd	5 cm x 3.66 m	
Roller Bandage	0	1	4 in. x 4 yd	10 cm x 3.66 m	
Scissors	1	1	N/A	N/A	
Splint	0	1	4.0 x 24 in.	10.2 x 61 cm	
Sterile pad	2	4	3 x 3 in.	7.5 x 7.5 cm	
Tourniquet	0	1	1.5 in. (width)	3.8 cm (width)	
Trauma pad	2	4	5 x 9 in.	12.7 x 22.9 cm	
Triangular Bandage	1	2	40 x 40 x 56 in.	101x 101 x 142 cm	

(ANSI 2022)

Minimum First Kit Requirements [ANSI/ISEA standard, Z308.1-2021] Class A

#### Figure 1A. ANSI/ISEA Z308.1-2021, Class A Kit Label

#### ANSI/ISEA Z308.1-2021, Class A, Type I, II, III or IV First Aid Kit

This kit meets the ANSI/ISEA Z308.1-2021 standard as sold. It contains first aid products which meet performance specifications detailed in the standard at the below required minimum fill. It will continue to be compliant only when maintained with products that meet the standard at specified quantities.

Req	uired Minimum Fill		
16	Adhesive Bandage 1 x 3 in. (2.5 x 7.5 cm)	1	Eye/Skin Wash 1 fl oz (29.6 ml) total
1	Adhesive Tape 2.5 yd (2.3 m), total	1	First Aid Guide
10	Antibiotic Application 1/57 oz (0.5 g)	1	Foil Blanket 52 x 84 in. (132 x 213 cm)
10	Antiseptic 1/57 oz (0.5 g)	10	Hand Sanitizer 1/32 oz (0.9 g)
1	Burn Dressing (gel soaked) 4 x 4 in.(10 x 10	2 pr	Medical Exam Gloves
	cm)	1	Roller Bandage 2 in. x 4 yd (5 cm x 3.66 m)
10	Burn Treatment 1/32 oz (0.9 g)	1	Scissors
1	Cold Pack 4 x 5 in. (10 x 12.5 cm)	2	Sterile pad 3 x 3 in. (7.5 x 7.5 cm)
1	CPR Breathing Barrier	2	Trauma pad 5 x 9 in. (12.7 x 22.9 cm)
2	Eye Covering w/ means of attachment 2.9 sq. in. (19 sq cm)	1	Triangular Bandage 40 x 40 x 56 in. (101 x 101 x 142 cm)

The described kit should be considered adequate for a workplace only when a hazard assessment of the work environment has been competed by competent personnel. For a variety of operations, employers may find that additional first aid supplies and kits are needed. Kits should be inspected frequently to ensure the completeness and usability of all first aid supplies. Any supply beyond its marked expiration date should be discarded and replaced.

Class A: kits intended to provide a basic range of products to deal with most common types of injuries encountered in the workplace including: major bones, minor wounds, minor burns, and eye injuries (ANSI 2022).

#### Minimum First Kit Requirements [ANSI/ISEA standard, Z308.1-2021] Class B

Figure 1B. ANSI/ISEA Z308.1-2021, Class B Kit Label

#### ANSI/ISEA Z308.1-2021, Class B, Type I, II, III or IV First Aid Kit

This kit meets the ANSI/ISEA Z308.1-2021 standard as sold. It contains first aid products which meet performance specifications detailed in the standard at the below required minimum fill. It will continue to be compliant only when maintained with products that meet the standard at specified quantities.

uired Minimum Fill	1	First Aid Guide
Adhesive Bandage 1 x 3 in. (2.5 x 7.5 cm)	1	Foil Blanket 52 x 84 in. (132 x 213 cm)
Adhesive Tape 2.5 yd (2.3 m) total	20	Hand Sanitizer 1/32 oz (0.9 g)
Antibiotic Application 1/57 oz (0.5 g)	4 pr	Medical Exam Gloves
Antiseptic 1/57 oz (0.5 g)	2	Roller Bandage 2 in. x 4 yd (5 cm x 3.66 m)
Burn Dressing (gel soaked) 4 x 4 in. (10 x 10	1	Roller Bandage 4 in. x 4 yd (10 cm x 3.66 m)
	1	Scissors
	1	Splint 4 x 24 in (10.2 x 61 cm)
	4	Sterile pad 3 x 3 in. (7.5 x 7.5 cm)
CPR Breathing Barrier	1	Tourniquet
Eye Covering w/ means of attachment 2.9 sq.	4	Trauma pad 5 x 9 in. (12.7 x 22.9 cm)
in. (19 sq cm) Eye/Skin Wash 4 fl. oz. total (118.3 ml)	2	Triangular Bandage 40 x 40 x 56 int (101 x 101 x 142 cm)
	Adhesive Bandage 1 x 3 in. (2.5 x 7.5 cm) Adhesive Tape 2.5 yd (2.3 m) total Antibiotic Application 1/57 oz (0.5 g) Antiseptic 1/57 oz (0.5 g) Burn Dressing (gel soaked) 4 x 4 in. (10 x 10 cm) Burn Treatment1/32 oz. (0.9 g) Cold Pack 4 x 5 in. (10 x 12.5 cm) CPR Breathing Barrier Eye Covering w/ means of attachment 2.9 sq. in. (19 sq cm)	Adhesive Bandage 1 x 3 in. (2.5 x 7.5 cm) Adhesive Tape 2.5 yd (2.3 m) total Antibiotic Application 1/57 oz (0.5 g) Antiseptic 1/57 oz (0.5 g)  Burn Dressing (gel soaked) 4 x 4 in. (10 x 10 cm)  Burn Treatment1/32 oz. (0.9 g)  Cold Pack 4 x 5 in. (10 x 12.5 cm)  CPR Breathing Barrier  Eye Covering w/ means of attachment 2.9 sq. in. (19 sq cm)

The described kit should be considered adequate for a workplace only when a hazard assessment of the work environment has been competed by, competent personnel. For a variety of operations, employers may find that additional first aid supplies and kits are needed. Kits should be inspected frequently to ensure the completeness and usability of all first aid supplies. Any supply beyond its marked expiration date should be discarded and replaced.

Class B: kits intended to provide a broader range and quality supplies to deal with injuries in counts in more populated, complex, an/or high-risk working environment (ANSI 2022).

#### **SUMMARY OF RECOMMENDATIONS:**

We recommend reaffirmation of Red Cross First Aid Kit Minimum Contents (see below), with modifications pursuant to the ANSI/ISEA Z308.1-2021 regarding Class A and B minimum first aid kit requirements and Red Cross First Aid Task Force expert opinion.

#### **Red Cross First Aid Kit Minimum Contents**

Because of the high probability of specific injuries and illnesses based on occupational data, first aid kits\* should be provided with the following for a SINGLE individual.

Item	Quantity	Minimum Size
Medical exam gloves	2 pair	
Adhesive bandage	3 each [4 each (16 total)]	1 x 3 in. <sup>3</sup> / <sub>4</sub> x 3 in. large fingertip knuckle
Adhesive tape	1	3/8" x 2.5 yd
Topical wound gel or ointment (topical antibiotic)	10	1/32 oz. (0.9 g) application [1/57 fl oz (0.5 g)]
Alcohol-based hand sanitizer	1(10)	1 oz [1/32 oz. (0.9 g)]
Eye/skin wash, saline solution	1	1 oz
First aid guidebook	1	1
Supplies to secure dressing, roller bandage	4	2 in., 3 in., or 4 in. x 4 yd
Utility shears/scissors	1	7"
Splint (compact, moldable splitting device with securing mechanism eg., roller bandage, elastic bandage, triangular bandage, tape)	1	4.0 x 24 in.
Supplies to control bleeding, sterile pad	8	4 x 4 in.
Tourniquet, manufactured, windless	1	
Triangular bandages	2	40 x 40 x 56 in.
Plastic bag, application of ice, storage of amputations or waste	2	1 qt. and/or 1 gal
(or instant cold pack)	(2)	(4 x 5 in.)
Aspirin	(81 mg x 4) or (325 mg x 1)	Low dose Adult aspirin, chewable
Oral glucose tablet	1 tablet	20 g
Splinter forceps/tweezers	1	

Quantity/size in red differs from ARC SAC recommendations but are needed if the kit is to meet current ANSI compliance

Items in red are new additions based on ANSI 2021 standards for class A first aid kits or language tidying to maintain consistency with the ANSI 2021 standards.

# **Optional Items**

The following items are optional items to be considered in a first aid kit. Items in red are optional items that will allow the kit to meet the 2021 recommendations for an ANSI Class A first aid kit.

Item	Quantity	Minimum Size
Breathing barrier, latex free-face shield	1	
Foil blanket	1	52 x 84 in.
Antiseptic towelette	10	1/57 oz. (0.5g)
Trauma pad	2	5 x 9 in.
Topical antibiotic application	10	0.14 fl oz (0.5 g)
Eye covering with means of attachment	1(2)	2 x 9 sq. in.
Burn dressing (gel soaked)	1	4 x 4 in.
Burn treatment	10	1/32 oz (0.9 g)
Hemostatic agent	1	
Epinephrine autoinjector	minimum 1, recommended 2 doses	
Hanks Balance Salt Solution (HBSS)	1	1 fl oz

<sup>\*</sup> All items should be latex free.

# **RECOMMENDATIONS & STRENGTH:**

**Guidelines:** Because of high probability of specific injuries and illnesses, first aid kits should be provided with the following emergency items based on a trauma or illness to a single individual:

- Latex-free gloves (Nitrile) x 2 pair
- Supplies to control bleeding (sterile 4 x 4 gauze pads) x 8
- Supplies to secure dressing (2 in., 3 in., or 4 in. x 4 yd roller bandage) x 4
- 3/8" x 2.5 yd. adhesive tape x 1
- Triangular bandages x 2
- Latex free adhesive bandage x 3 each
  - o 1 x 3 in.
  - o 3/4 x 3 in.

<sup>\*</sup> All items should be latex free.

- large fingertip
- o knuckle
- Topical wound gel or ointment, 1/32 oz. (0.9 g) application x 10
- Compact, moldable splitting device with securing mechanism (eg., roller bandage, elastic bandage, triangular bandage, tape) x 1
- Plastic bag 1 qt. and/or 1 gal) for application of ice: water x 4 and/or instant cold packs x 2
- Low dose aspirin (81 mg x 4) or adult aspirin (325 mg x 1), chewable
- Oral glucose tablet, minimum of 20 g
- Saline solution, minimum 1 oz x 1
- Utility shears/scissors, 7" x 1
- Alcohol-based hand sanitizer x 1 oz
- Splinter forceps/tweezers x 1
- Latex free-face shield x 1
- First aid guidebook x 1

**Options:** We suggest adding Hank's Balanced Salt Solution (HBSS) to a first aid kit when there is a risk of possible dental avulsion.

The following items are optional items to be considered in a first aid kit. \*These optional items will allow organizations to meet the 2015 recommendations for a Class A first aid kit.

- \*Antiseptic towelette, 0.14 fl. oz. (0.5g) application x 10
- \*Trauma pad 5" x 9" x 2
- \*Topical antibiotic, 0.14 fl. oz. (0.5 g) application x 10
- \*Eve covering with means of attachment, 2 x 9 sq. in, x 1
- \*Burn Dressing 4 x 4 in" x 1
- Tourniquet, manufactured windless x 1unit
- Protective eyewear
- Protective facemask
- Naloxone (nasal or injection) minimum 1 dose, recommended 2 doses
- Hemostatic agent x 1 unit
- Epinephrine autoinjector x minimum 1, recommended 2 doses- Public care environments, such as schools or day camps, with potential delayed access to emergency care could consider epinephrine autoinjectors based on perceived need.
- Hank's Balanced Salt Solution (storage of avulsed tooth)

#### **Best Practice Statements:**

- We recommend periodically checking first aid kits for expired items and replacing them as needed.
- Individuals should customize the first kit based on specific medical needs or any personal health conditions of the individual, environment, or while traveling.
- Consider taking a first aid and CPR course to learn how to properly use the items in your kit.

# **IMPLICATIONS FOR AMERICAN RED CROSS PROGRAMS:**

Existing guidance for First Aid Kits are updated with this review to include modifications pursuant to the ANSI/ISEA Z308.1-2021 regarding Class A and B minimum first aid kit requirements and Red Cross First Aid Task Force expert opinion.

Hank's Balanced Salt Solution has been added as an option for first aid kit inclusion for use to store an avulsed tooth prior to reimplantation.

#### **SUMMARY OF EVIDENCE UPDATE:**

N/A

#### **REFERENCES:**

American National Standards Institute/International Safety Equipment. *American National Standard for Minimum Requirements for Workplace, First Aid Kits and Supplies*. ISEA Z308.1-2021 Revision of ANSI/ISEA Z308.1-2015; 2022.

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