

The MioMed Kit



Industrial Design III

2022

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Problem Statement

Design and quickly prototype a soft good First Aid Kit for the C2C (Connection To Care) homeless/opioid user bags.

This can be a permanent or removable attachment to the original bag and keep in mind its potential use of holding personal hygiene products, first aid kit materials, medications, and other valuables.

Initial Thoughts/Ideas

What materials can we use/are available to the manufacturer?

- Check Dynovis Website for ideas of what materials they may have available

Things to keep in mind:

- It can be a separate pouch, removable, or permanently inside the bag as a pocket
- It needs to be producible/manufacturable
- They should be able to access to their medications/first aid rather simply
- The location of the Narcan is easily readable and able to be seen/labeled

Ideas for kit:

- Something to be able to put their used needles so they won't injure themselves or someone else that is reaching into the bag (a material that they cannot poke through)
- Could be useful to have a hidden pocket to keep their stash safe
- Modular design with differences in the compartments/levels/sizes
- Padding/smaller container for pills to not be crushed
- Waterproof to preserve the medications and products
- A rubber pad that helps with opening pill bottles

Research

What is Narcan?

From: Narcan FAQ- <https://www.narcan.com/frequently-asked-questions/>

Highlights:

- “a prescription medicine used for the treatment of an opioid overdose emergency
- “...to be given right away and does not take the place of emergency medical care. Get emergency medical help right away after giving the first dose of NARCAN Nasal Spray, even if the person wakes up.”
- No special training, measuring, or assembly is required to use Narcan, it comes as a ready-to-use device that contains a single, prefilled, premeasured dose of naloxone.

How to administer Narcan?

From: NARCAN Instructions for Use PDF- <https://www.narcan.com/wp-content/uploads/2021/11/Gen2-Instructions-For-Use.pdf>

Highlights:

- PEEL back the package to remove the device. Hold the device with your thumb on the bottom of the red plunger and 2 fingers on either side of the nozzle
- PLACE the tip of the nozzle in one nostril until your fingers touch the bottom of the patient’s nose
- PRESS the red plunger firmly to release the dose into the patient’s nose

What are the standard sizes of needles for substance users?

From: Variations in Needles and Syringes Used by Injecting Drug Users- <https://nida.nih.gov/international/abstracts/variations-in-needles-syringes-used-by-injecting-drug-users>

Highlights:

- “Syringes received to date range in size from 0.5 ml to 25 ml, with needles ranging in diameter from 30 gauge to 21 gauge and in length from 1/2 inch to 1 1/2 inches.”

From: Management of Household Sharps- <https://www.deq.virginia.gov/home/showpublisheddocument/2483/63743802487770000#:~:text=Use%20an%20empty-%2C%20rigid%20or,milk%20jugs%2C%20or%20aluminum%20cans.&text=Seal%20with%20a%20tight%2Dfitting,lid%20of%20homemade%20sharps%20containers>

Highlights:

- A rigid, heavy-duty plastic container that has a tight-fitting cap or seal.

Hygienic information on those who are homeless/substance users?

From: Personal Hygiene Practices among Urban Homeless Persons in Boston, MA-
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5580630/>

Highlights:

- Many skin conditions are due to unsanitary clothes, sleeping conditions, and infrequent showers.
- “People experiencing homelessness may be more likely to experience recurrent skin infection following treatment as well, possibly due to challenges in maintaining skin hygiene, reinfection from continued exposure to contaminated surfaces in the living environment, or lack of follow-up care”
- Locations for sleep: Homeless shelters, streets/outdoors, transitional housing, friend or family member, and housing without support services.
- 71% showered daily and most showers were in shelters or other homeless service providers
- 70% hand washed more than 5 times a day
- 90% reported use hand sanitizer

What kind of illnesses or medical issues can arise from housing insecurity/drug use?

From: Homelessness, Personal Hygiene, and MRSA Nasal Colonization among Persons Who Inject Drugs- <https://link-springer-com.ezproxy.lib.vt.edu/content/pdf/10.1007/s11524-019-00379-9.pdf>

Highlights:

- “These findings are suggestive of bacterial contamination of these public facilities intended to support sleep and hygiene among persons experiencing housing instability. It is also likely that increased person-to-person contact or crowding in shelters facilitates the transmission and persistence of pathogens, including MRSA.”
- Personal cleaning products/sanitizers are a must! It’s very important to clean some surfaces/handwashing before using them, it can prevent contamination and infections.

Research Cont.

How are those who are struggling with housing insecurity and using treated by others?

From: An Experimental Approach to Assessing the Attitudes of Social Service and Healthcare Employees toward the Homeless- <https://web-p-ebscohost-com.ezproxy.lib.vt.edu/ehost/pdfviewer/pdfviewer?vid=0&sid=20fee7db-9980-47d8-b6e1-c6ef480a603a%40redis>

Highlights:

- On the one hand, there is evidence of prejudice toward a hypothetical homeless client in terms of the belief in his/her ability to read, manage money, and take care of personal hygiene. At the same time, there were also some positive findings, in that participants did not seem to judge the client's criminal history, interest in attending college, access to health insurance, and other public services.
- "findings suggest a certain lack of awareness into one's discriminatory beliefs, which can lead to inadvertent microaggressions or more subtle acts of discrimination."
- "The current investigation reinforces the need for more extensive training for service providers who might have to treat homeless clients at some point in their career. Specific training that can assist service providers with understanding their own biases and implicit associations as well as learning about micro-intervention strategies can prove to be exceptionally useful."

Sources used for what to include in the kit:

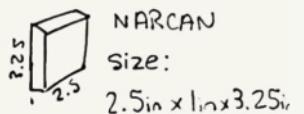
1. The Red Cross: <https://www.redcross.org/store/deluxe-family-first-aid-kit/321275.html?cgid=first-aid-supplies#start=1&cgid=first-aid-supplies>
2. Federal Emergency Management Agency: <https://www.fema.gov/blog/10-items-include-your-emergency-kit>
3. Recovery Problem Solutions of Virginia: <https://www.rpsva.org/homelesssurvivalkits/>
4. Doing Good Together: <https://www.doinggoodtogether.org/bhf/homeless-care-kits>
5. St. Edwards University: <http://sites.stedwards.edu/seucombatshomelessness/2021/04/07/homeless-care-packages-dos-and-donts/>

Design Process Begins!

Sketching
Fabric Prototype
Paper Prototype
Canvas Prototype
Treatment Booklet
Edits/Finalizing Design

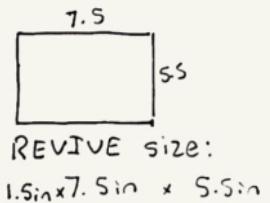
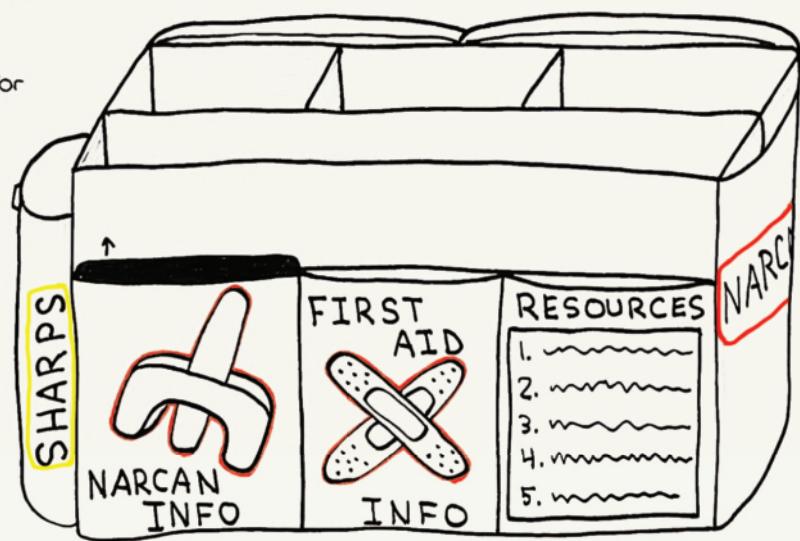
Sketches

*FLEXIBLE & SOFT material
•waterproof *



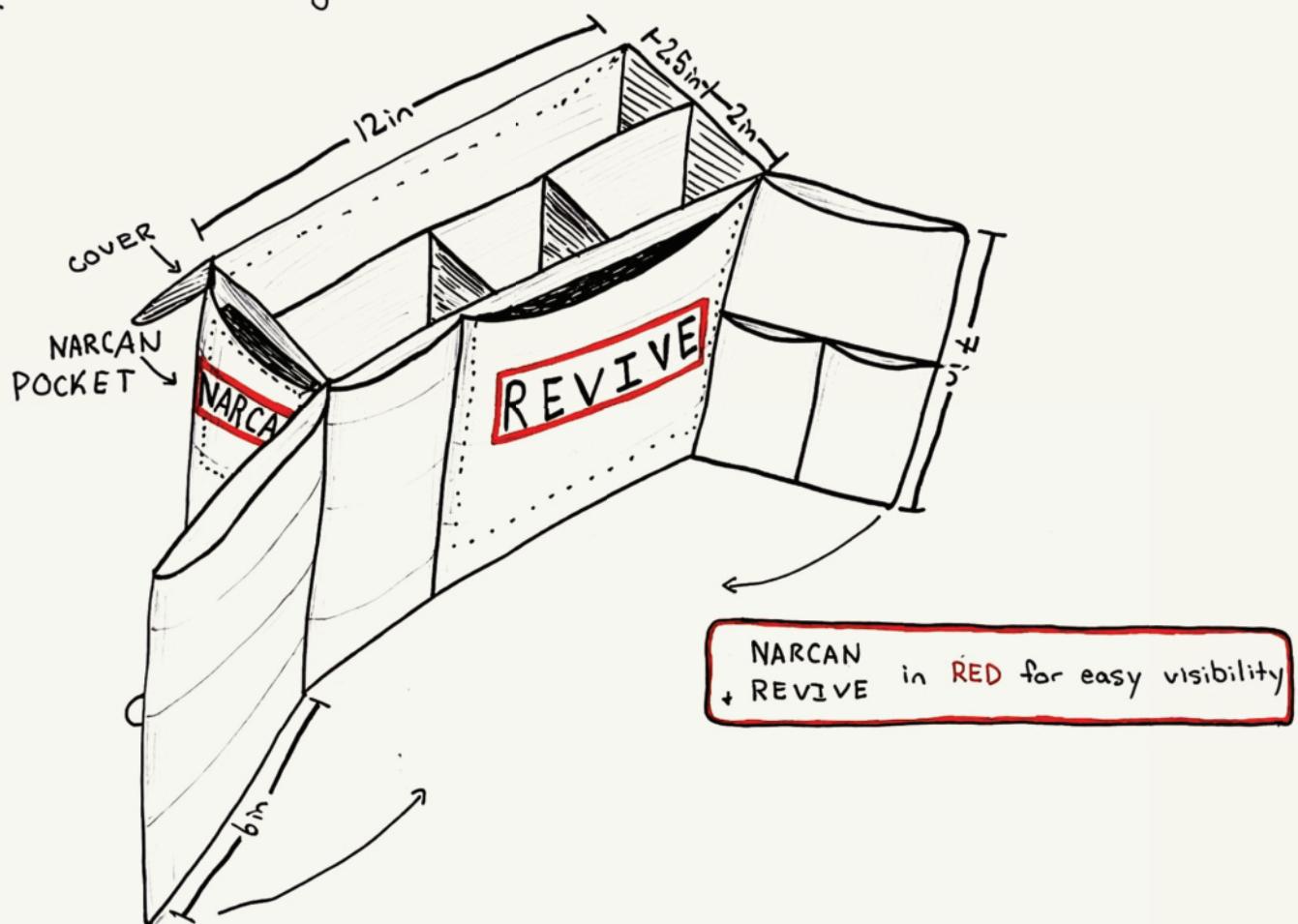
- Brighter color for SHARPS
- Red or Orange for First Aid related

SHARPS CONTAINER
• What is size of provided SHARPS container?



- packets and cards
Slip out from top
- CLEAR POCKETS
to see:
1. NARCAN information/how to instructions/illustrations
 2. General first aid information and illustrations to treat
 3. The resource card they were given

small + large compartments can
double for personal hygiene
and First Aid storage!



Prototype #1: Fabric

12in x 4.5in x 7in

Back Opened



Back Closed



Front



Top View



Main Body of the kit:
3 identical pockets
1 large pocket

Prototype #2: Paper

8in x 3.33in x 4.66in

Scaled down by 1.5 from prototype #1

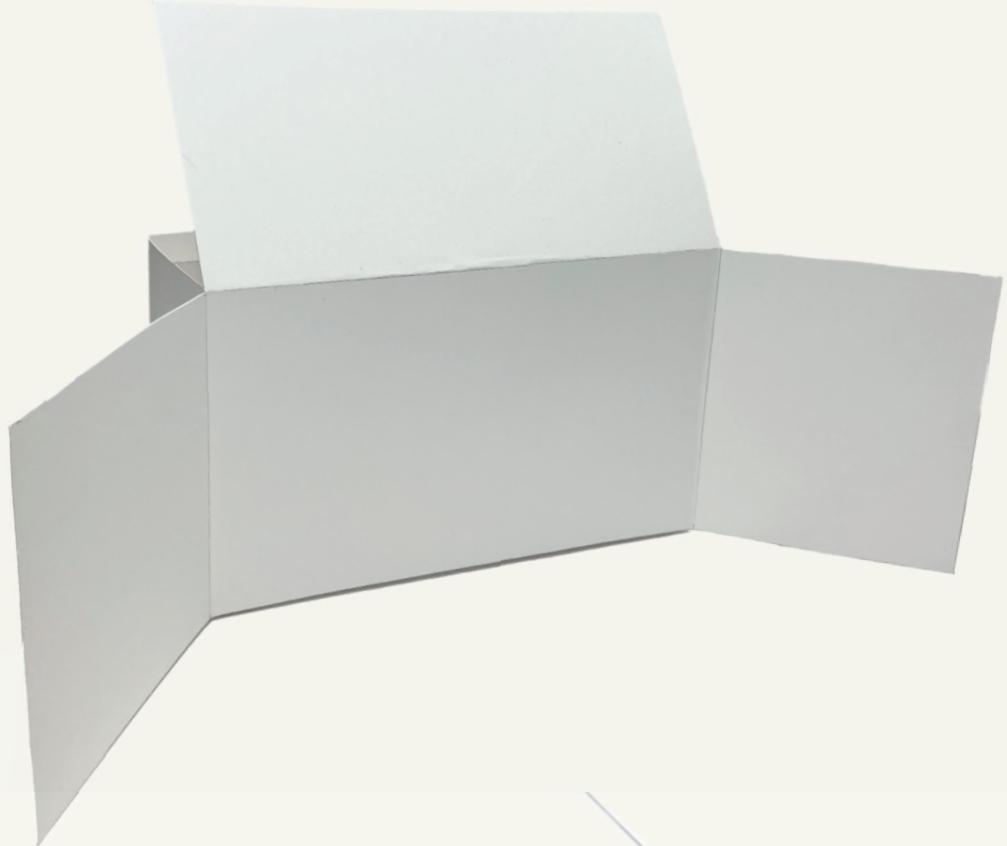
Front



Top View



Back



Back Closed



Prototype #3: Canvas

12in x 5in x 7in



Room for revive kit/sharps container

Adjustable nylon strap and handle

Side pocket that fits 1 narcan pack

Secures to buckles in main bag

Illustrated treatment booklet

Pockets ranging in size



Materials:

Waterproof Vinyl Canvas

Clear Plastic

Mesh

Velcro Strips

Nylon Straps

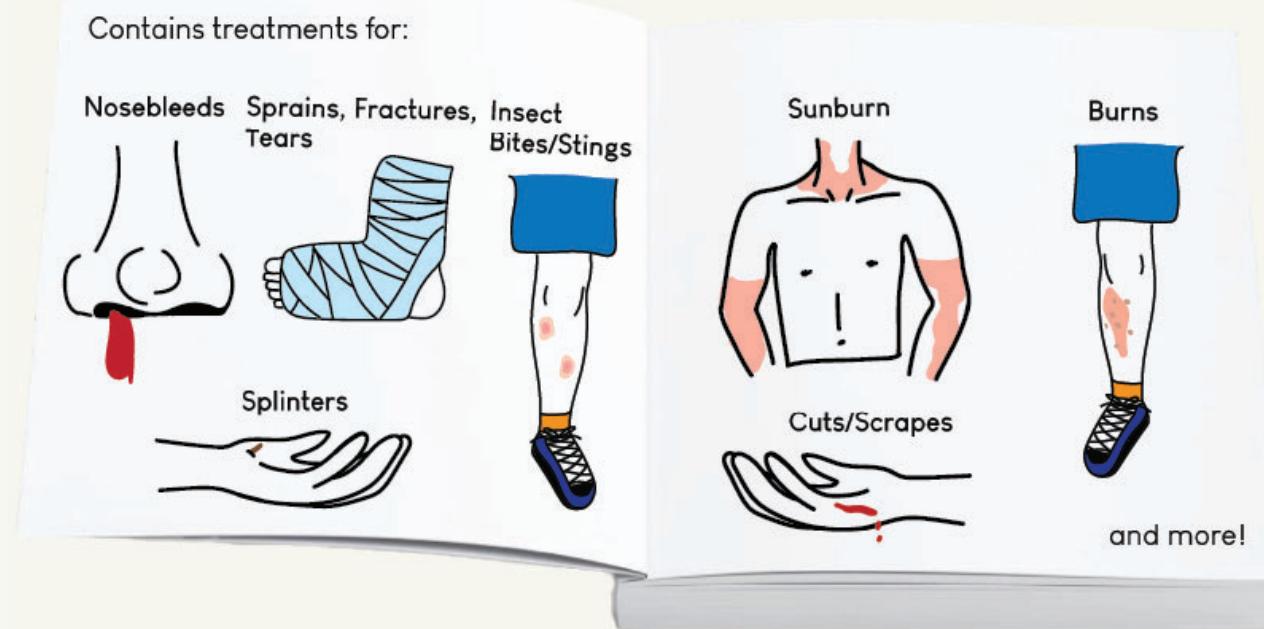
Rubber Pipe

Prototype #3: Canvas





Treatment Booklet



Source: Safetec.com- <https://safetec.com/blog/first-aid/8-of-the-most-common-first-aid-injuries/>

Written treatent information to partner with illustrated treatment directions:

Nosebleed:

Sit upright and don't tilt your head back. Loosen any tight clothing around your neck. Pinch the lower end of the nose close to the nostrils and lean forward while you apply constant pressure for five to ten minutes. Don't release and check the nose; it could prolong the bleeding. If the nosebleed is the result of trauma, you can reduce swelling by holding an ice pack against the bridge of the nose after the bleeding slows down. If it persists for more than ten minutes or returns later, call your doctor or go to the Emergency Room to check for breakage.

Sprains, Strains, and Tears:

The first thing to do is immobilize the affected area, elevate it, and apply ice and compression to reduce swelling. Strains accompanied by severe pain, swelling, or discoloration may require a trip to the hospital. In milder cases, rest, ice, and anti-inflammatory medication will help the area heal.

Fractures:

The affected part should be immobilized, and additional manipulation of the affected area should be avoided. Immobilize the injured part, and transport the patient to the nearest hospital or medical clinic as soon as possible.

Insect Bite/Sting:

If the insect left a stinger, gently scrape the skin with your fingernail to remove it without breaking it. Refrain from using tweezers because that can squeeze more venom out of the stinger, causing further injury. To combat itching, apply 1% hydrocortisone cream or a topical antihistamine if the skin isn't broken or scabbed. Call 911 if you have trouble breathing, coughing, or develop a hoarse voice, hives, or swollen lips or tongue. Contact your doctor if you suspect a tick bite.

Splinter:

Use soap and water to wash around the splinter. Clean a pair of tweezers with rubbing alcohol and slowly pull the splinter out. Rewash the skin. If you come across a fragment that is hard to remove, leave it for a day or so to see if it will come out on its own.

Sunburn:

If your only symptoms are discomfort and redness, apply cold compresses and aloe vera lotion and take some ibuprofen. Avoid creams with petroleum, (can cause infection), or anything ending in -Caine. If you feel dizzy, weak, sick to your stomach, or are spiking a high fever—or if the burn is severe (oozing blisters form within 2 days) and covering a large portion of your body—go to the Emergency Room.

Burn:

Immediately hold injury under cold running water or apply a cold, wet towel until the pain subsides. Cover any small blisters with a loose bandage or gauze and tape. DO NOT pop any blisters yourself. If the skin breaks, apply antibiotic cream and cover the area with a bandage or gauze until it's healed. Watch for any redness, swelling, tenderness, or discharge for these are all signs of infection. Call a doctor as soon as possible if burns are on the face, hands, or genitals, or if they're larger than 1/4 inch anywhere on the body.

Cut/Scrape:

If there is bleeding: press firmly over the site with a clean cloth until it stops, anywhere from three to 15 minutes. Clean with lukewarm running water and gently pat dry.

If the skin is broken: apply a thin layer of antibiotic ointment, then cover with a bandage or gauze and adhesive tape. If you can't control the bleeding after several attempts with direct pressure, call your pediatrician or head to an Emergency Room. Continue utilizing antibiotic ointment and apply a new bandage daily (or more often if necessary) until the cut heals. If the wound appears to be forming or draining pus or becomes swollen, tender, or red, see a doctor right away to treat the infection.

The MioMed Kit



General First Aid Treatment Booklet

Contains treatments for:

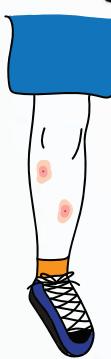
Nosebleeds



Sprains, Fractures,
Tears



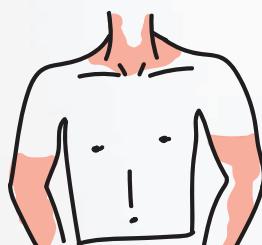
Insect
Bites/Stings



Splinters



Sunburn



Cuts/Scrapes



Burns



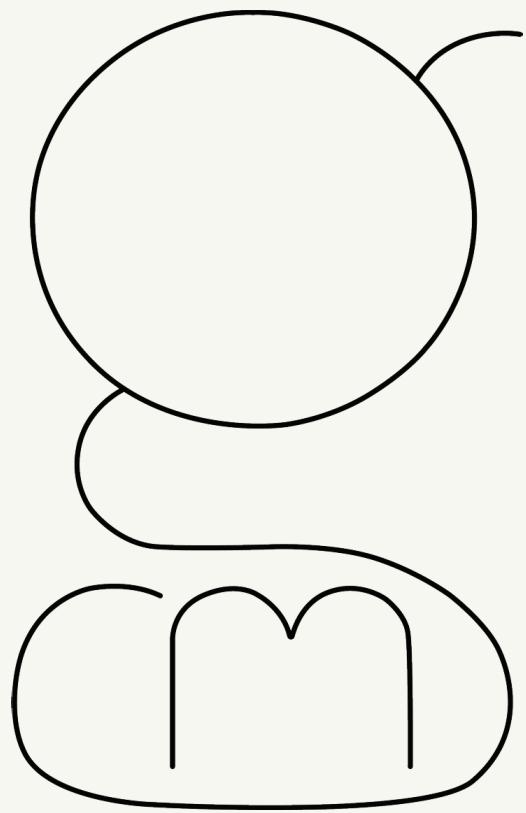
and more!



back closed



- <side pocket that fits 1 narcan pack
- <room inside for revive kit/sharps container
- <adjustable nylon strap and handle
- <pockets ranging in size
- <illustrated treatment booklet



gcmdesigns