



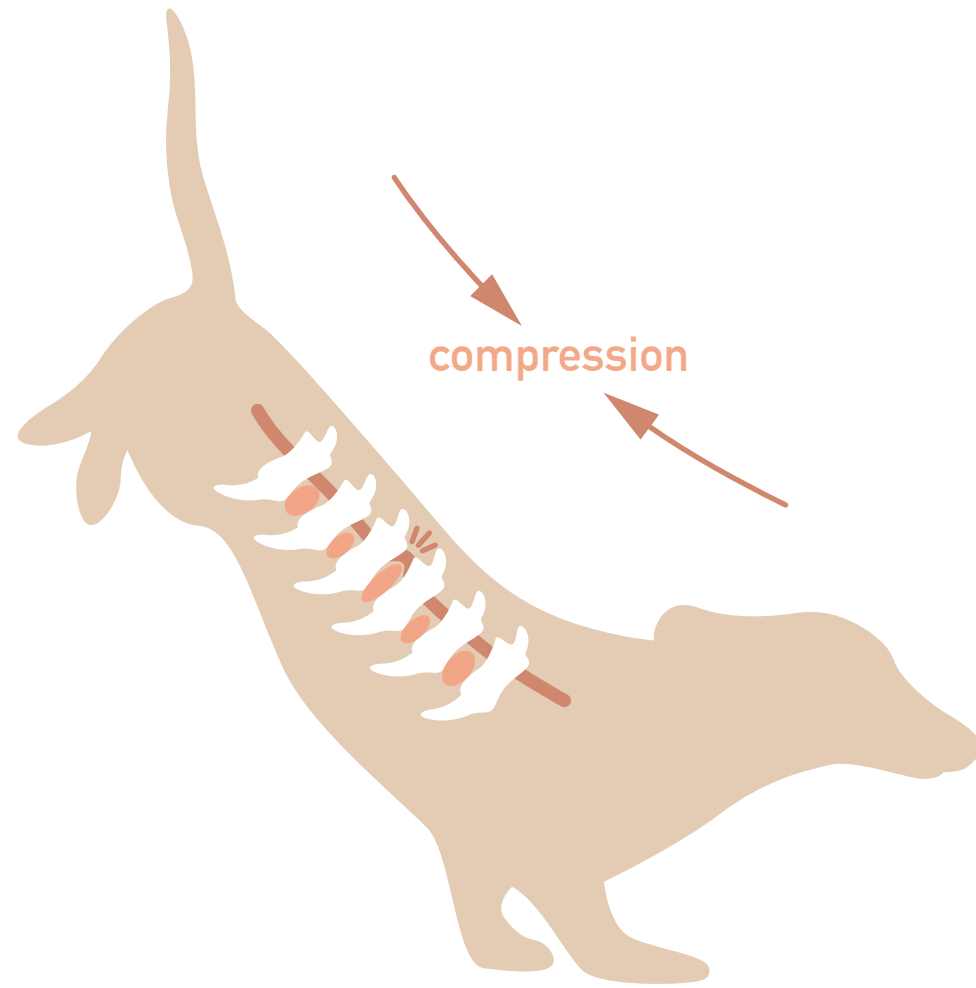
**Heel**

At-home care system for injured dogs

---

## What is IVDD?

IVDD (Intervertebral Disc Disease) occurs in dogs when the cushioning intervertebral discs between the vertebrae of their spinal column become displaced, deteriorate, bulge out, rupture, or burst into the spinal cord space. When this happens, the discs press on the nerves that run through the spinal cord.



### Type I

The outer layer of the discs harden, allowing them to break easily. Jumping puts extra pressure on the discs and can cause them to burst. After bursting, the disc's inner materials start to press on the spinal cord.

### Type II

Discs slowly harden over time, and eventually start to deteriorate or bulge, putting pressure on the spinal cord. When the nerves of the spinal cord are compressed, they are unable to transmit nerve impulses.

## What are the symptoms?

- Pain
- Weakness in back legs
- Hunched back or tense muscles
- Muscle spasms
- Reduced activity or appetite
- Sensitivity to touch or movement
- Anxious behavior
- Loss of bladder control
- Paralysis (in severe cases)



## What are the risk factors?

Small dogs with short legs are the most commonly affected by IVDD.

Dogs that are overweight and lack proper exercise are at the highest risk.

Dogs typically become more prone to back problems as they age.

Jumping from high furniture can cause damage to the spinal discs, especially in breeds with short legs.

### Grade I: pain only

Dogs may exhibit signs of pain, muscle spasms, and an unwillingness to jump, but can still walk normally.

### Grade II: ambulatory paraparesis

Dogs may experience weakness in their hind legs and appear wobbly or stumble when they walk.

### Grade III: non-ambulatory paraparesis

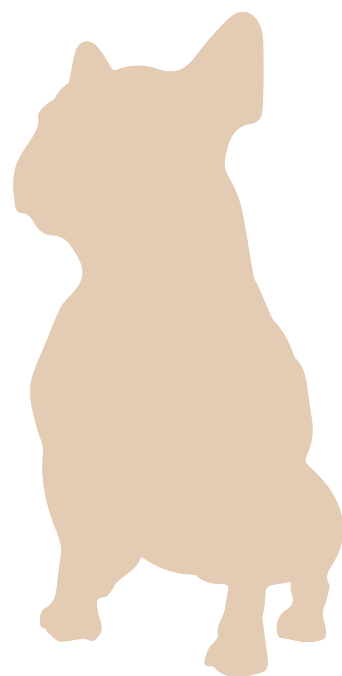
Dogs are no longer strong enough to support their own weight or walk, but still have movement in their legs.

### Grade IV: paraplegia

Dogs can no longer voluntarily move their back legs. They can, however, still feel deep pain.

### Grade V: paralysis

Dogs no longer have any feeling in their back legs, in addition to not being able to move them.



## How is IVDD treated?

Based on the severity of each dog's condition as well as external factors, there are two options for treatment: conservative treatment or surgery.



### Conservative

**Consists of:** strict crate rest, medication, limiting mobility, and possibly physical therapy

**Recommended for:** Less severe cases (grades I-II) or when surgery is not an option

**Estimated cost:** < \$1000 for exam and medication

**Medication:** steroids and anti-inflammatories

**Estimated recovery time:** 6-8 weeks

**Prognosis:** grades I-II have a very good chance of recovery, while higher grades are not as likely to have a full recovery. There is also a higher chance of the problem recurring than with surgery.

**Possible complications:** potential IVDD issues in the future if not healed properly



### Surgery

**Consists of:** removal of harmful disc material followed by some physical therapy

**Recommended for:** More severe cases (grades III-V) but is an option for less severe cases as well

**Estimated cost:** \$2000 - \$6000 for surgery alone

**Medication:** dependent on individual cases

**Estimated recovery time:** 1-3 weeks

**Prognosis:** grades I-IV have a very good chance of recovery, but grade V may not be successful or may even worsen.

**Possible complications:** Myelomalacia (irreversible damage to spinal cord, sometimes fatal), urinary tract infections, or long-lasting mobility issues

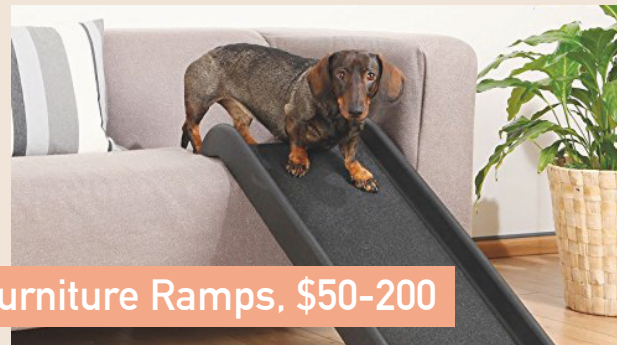
## At-Home Care Recommendations

- Limit movement during the recovery period, either with crate rest or a small, closed off area
- It may be necessary to express your dog's bladder (applying manual pressure to assist with urination)
- Dogs may require physical support of their back end when going to the bathroom
- Prohibit your dog from going up and down stairs or jumping on and off furniture
- Monitor how your dog is responding to medication, as well as eating/drinking habits
- Start to introduce physical therapy exercises to help your dog rebuild muscle
- Keep in contact with your dog's veterinarian about their progress
- If your dog's condition does not improve, a rear-supporting wheelchair may be recommended

## Assistive Products



Handheld Slings, \$20-80



Furniture Ramps, \$50-200

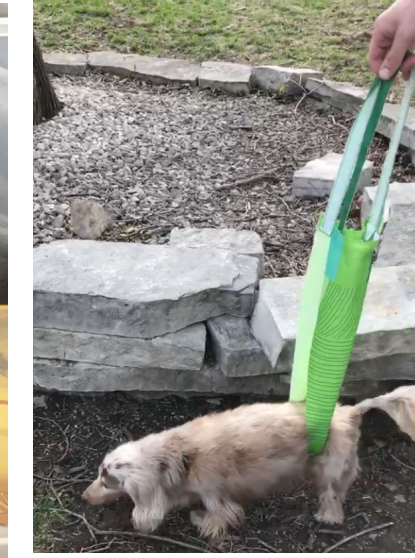


Dog Wheelchair, \$60-500

## IVDD Stories



Emmie



"Emmie is twelve years old, and when we found out she had a deteriorated disc, we agreed that surgery was not the best option for her. Although she was Grade 5, we still had hope and took our chances with medication and crate rest.

"Within just a few days, we saw some movement in her back legs again! She does not like to be in her crate when we are home (she likes to be included) so we filled a bin with her bed, pee pads, blankets, and her water bowl rested on a board game box so we could set her on the couch or carry her around with us.

"After about a week, we took her out for short bathroom breaks with the support of a homemade sling made from a grocery bag. Six weeks later, she was back to walking on her own without our help, and all discomfort seemed to be gone.

"Five months later, she is back to her happy squirrel-chasing self, but we are careful not to let her jump, carry her often, and use a baby-gate to block off the stairs."



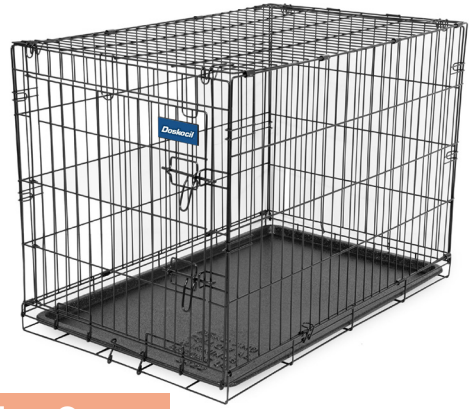
Daisy

"After her surgery, Daisy underwent six weeks of strict crate rest. During this, we expressed her bladder and gave her medicine. Although she is still paralyzed, she is now pain free and happy!"



Zeke

"During Zeke's recovery, I was afraid of picking him up. He was so fragile, what if I hurt him again? Thankfully, he made a quick recovery and is back to himself, but I have to keep a close eye on him now."



### Wire Crate

- Heavy, not easily transported
- Can be difficult to break down
- Poor accessibility to dog
- Often stays in one part of the home
- Very common



### Travel Crate

- Lightweight, easier to transport
- Can be dark or visually closed-off
- More difficult to clean
- Less durable/stable
- Not as commonly used at home

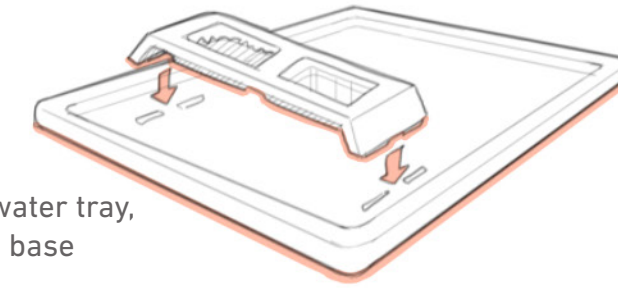
## Insights

Dogs may feel alone, upset, or restless during crate rest. Although it may be an emotional time, owners should never end crate rest before their dog is physically ready.

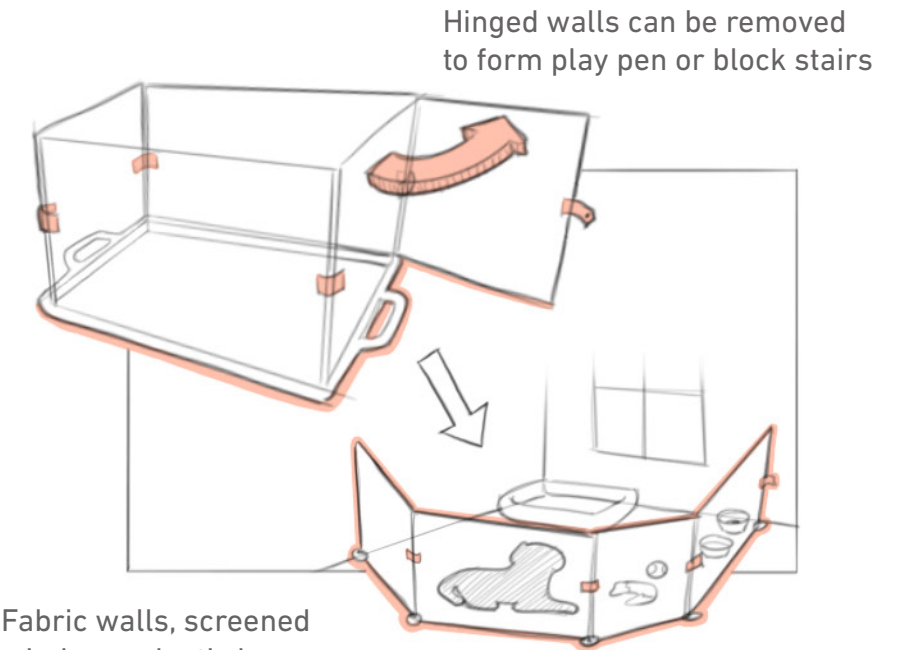
During the recovery period, owners will need to transport their dog, give food/water and medicine, and possibly express their bladder or do physical therapy exercises.

After dogs have recovered, barriers to block stairs or create safe areas could be helpful to monitor behavior and prevent future injury.

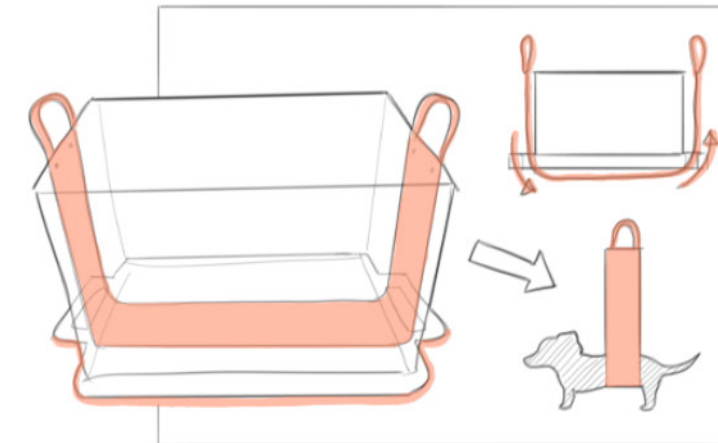
**Objective: to design a comfortable enclosure for dogs on crate rest with good accessibility and visual openness that is easily transported.**



Raised food and water tray, snaps into plastic base

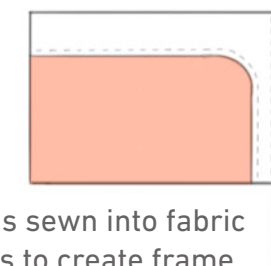


Hinged walls can be removed to form play pen or block stairs

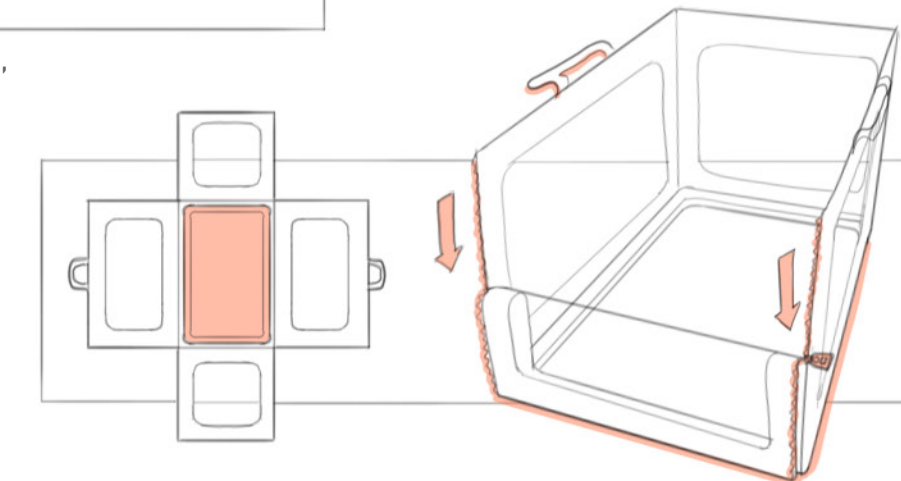


Fabric walls, screened windows, plastic base

Secure carry-strap wraps around base, can be used as supportive sling



Poles sewn into fabric walls to create frame



Walls zip down for better accessibility

## Prototype and User Feedback



“Zipping down a wall part-way would be nice, as long as she couldn’t climb over it easily.”

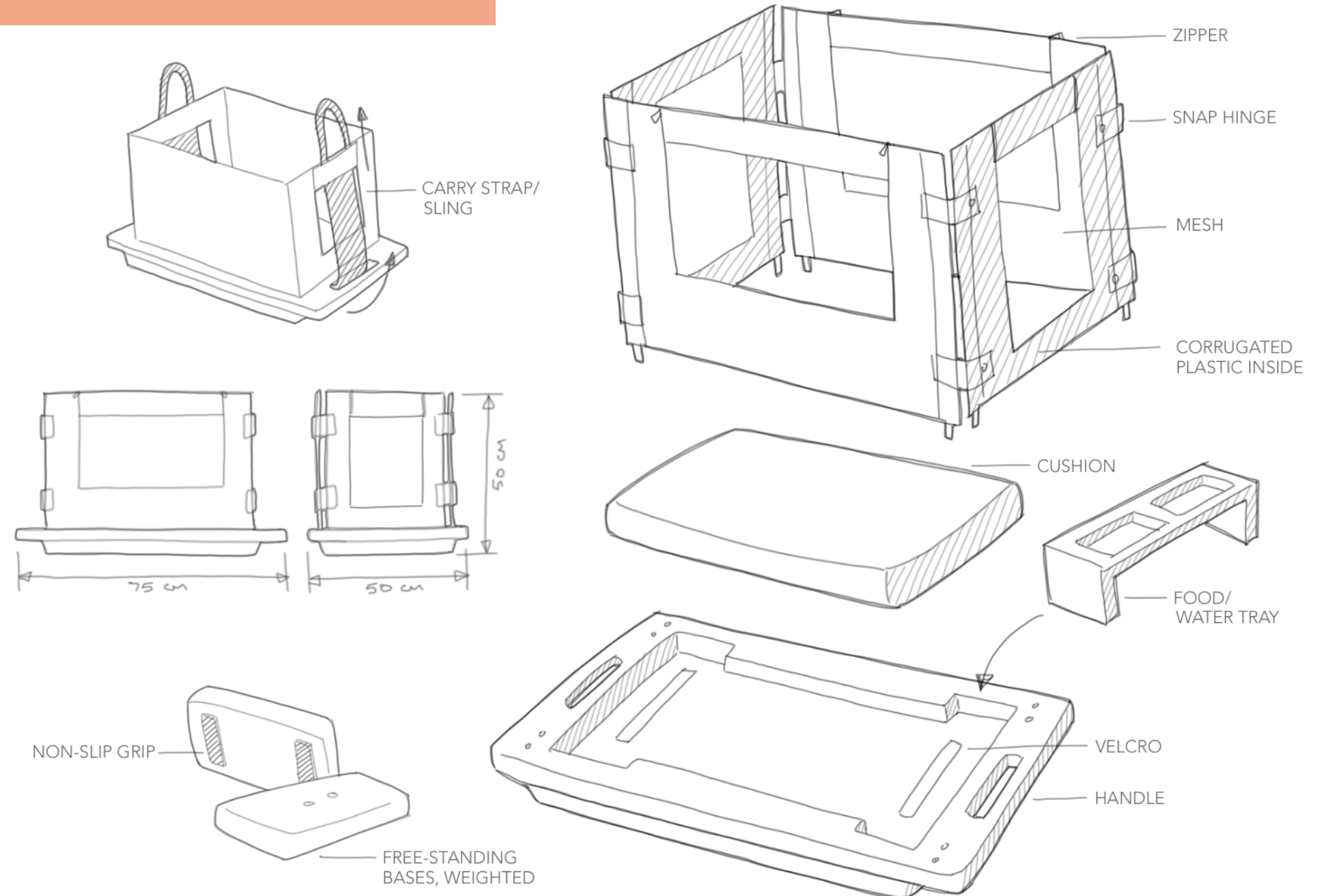


“I love the idea of a free-standing barrier, but it would need to be very stable”



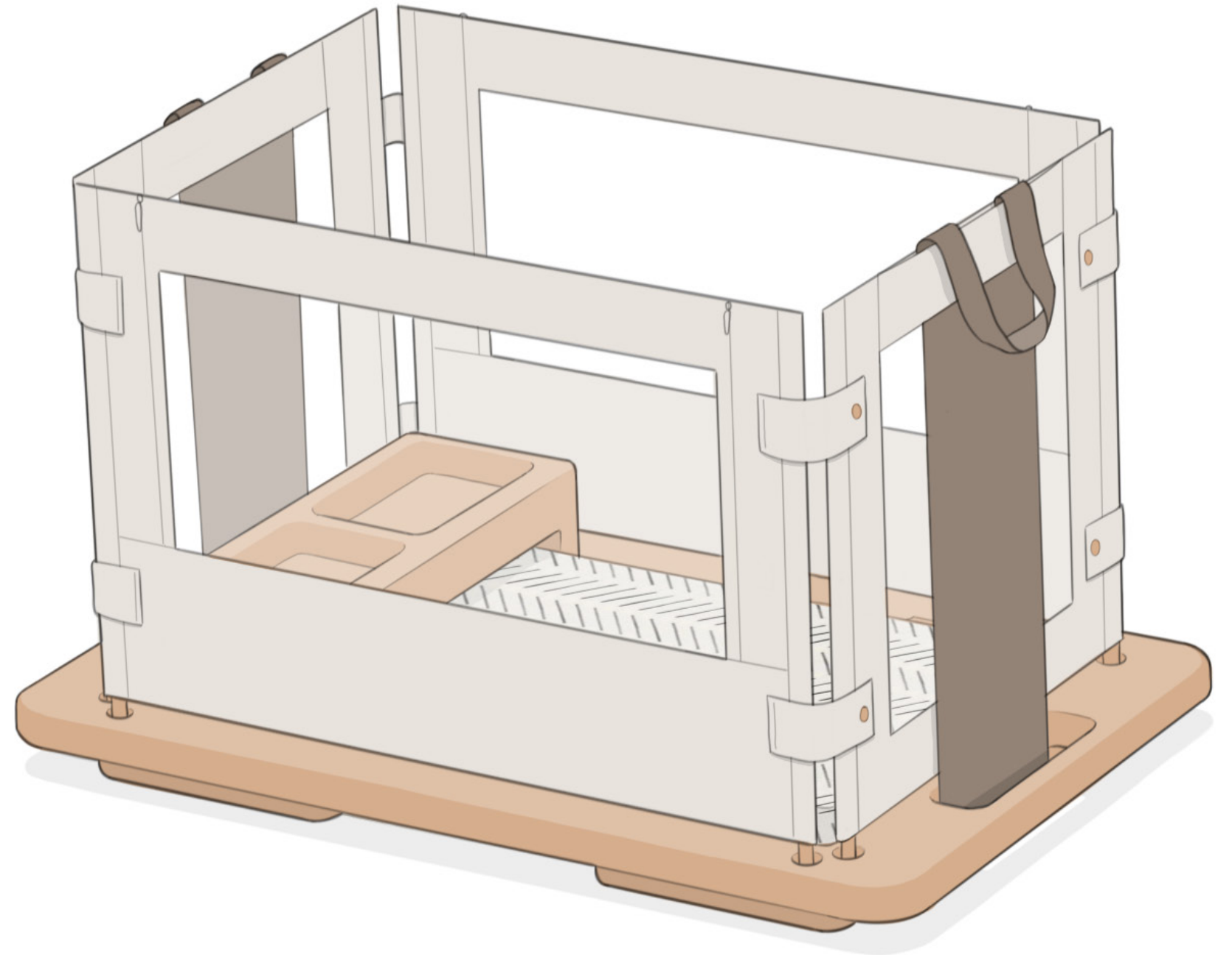
“The ability to detach individual walls for interacting with her or changing the barrier size is a great addition.”

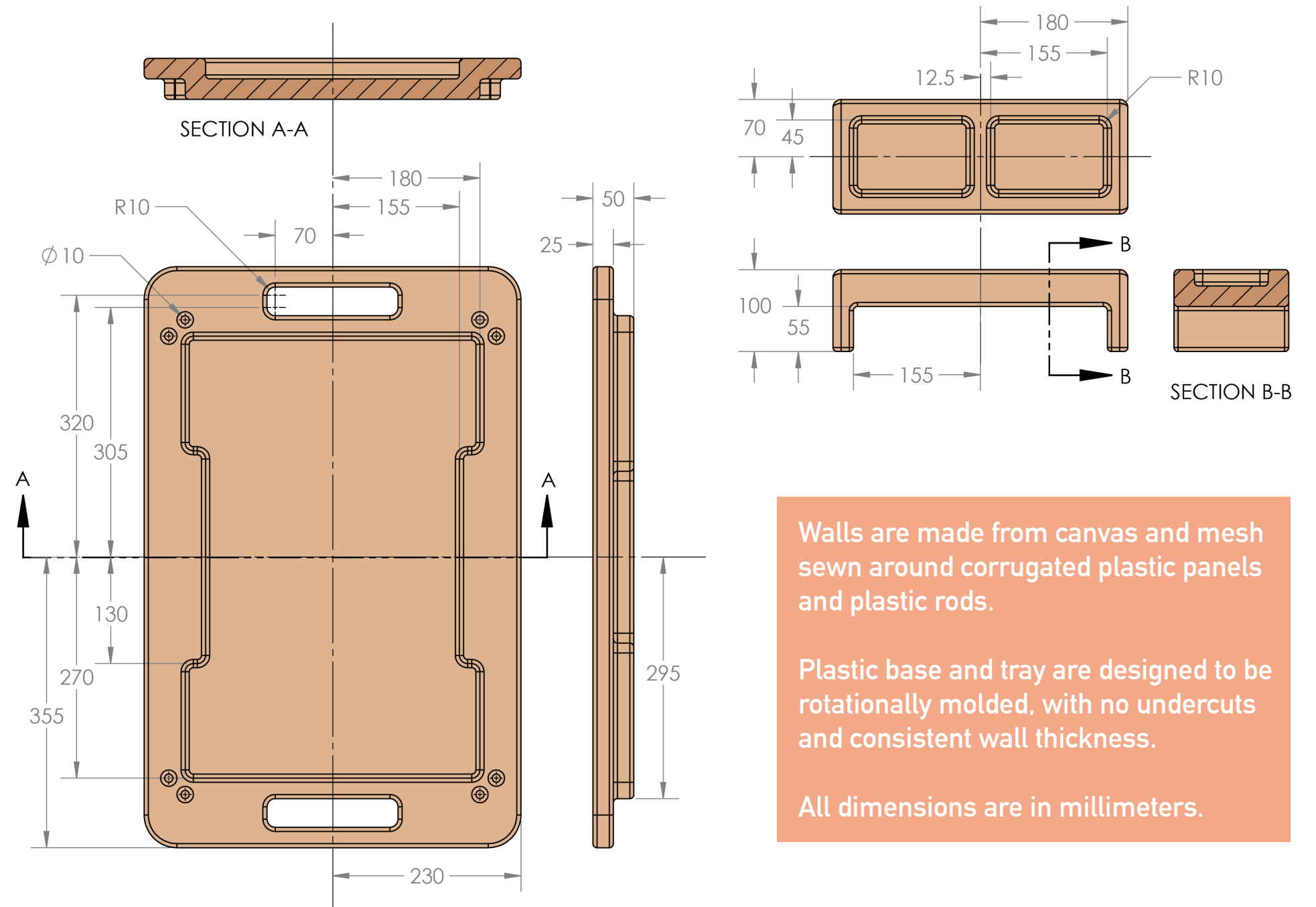
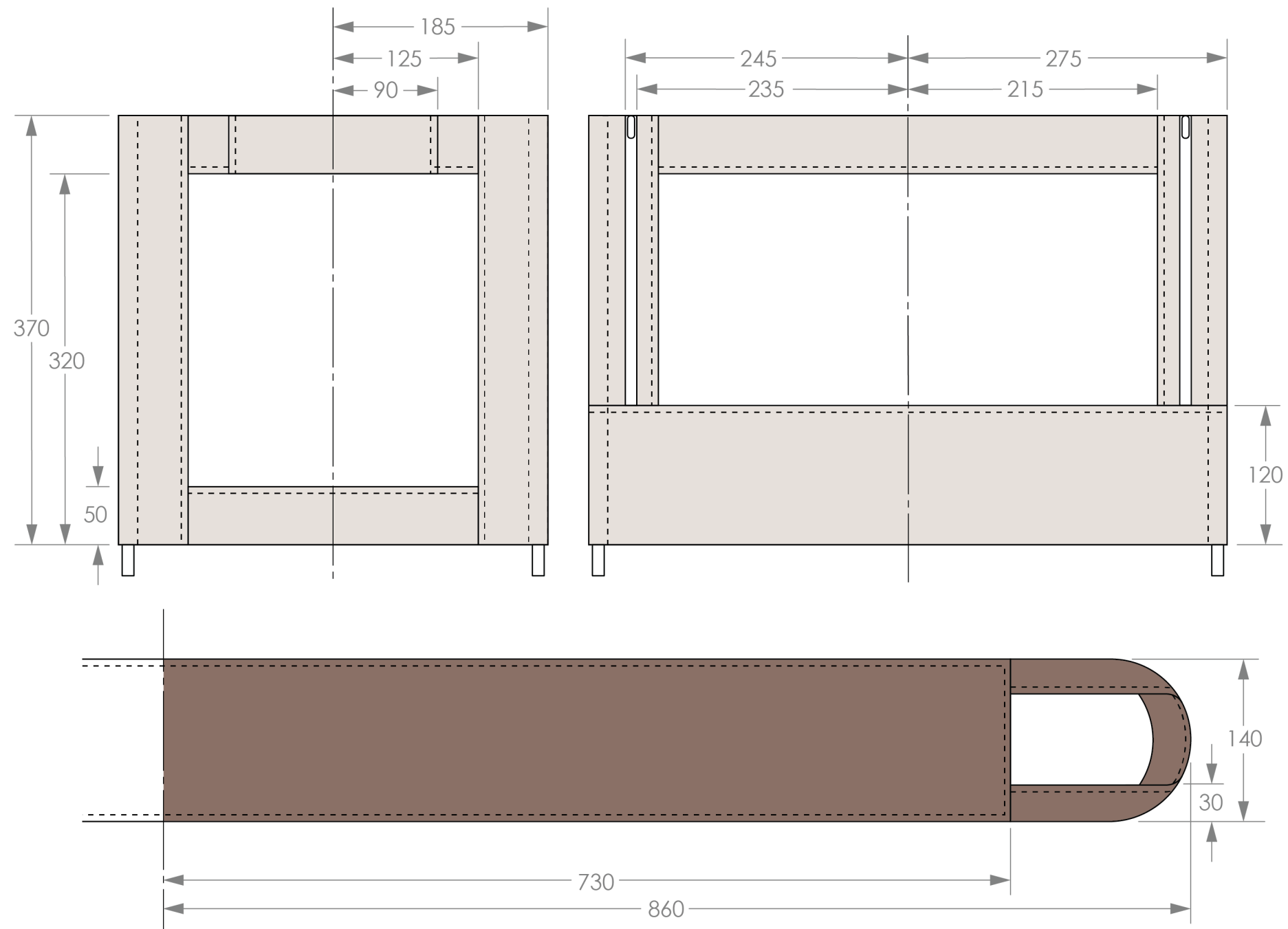
## Concept Refinements



# Home Trends Study

- Warm-toned neutrals for a light and cozy feel
- Patterned textiles for contrast and visual interest
- Simple, geometric shapes for a modern look









Whether your dog is healing from an injury or surgery, crate rest is vital for a healthy recovery.

Crate-rest will generally last around 4-8 weeks.

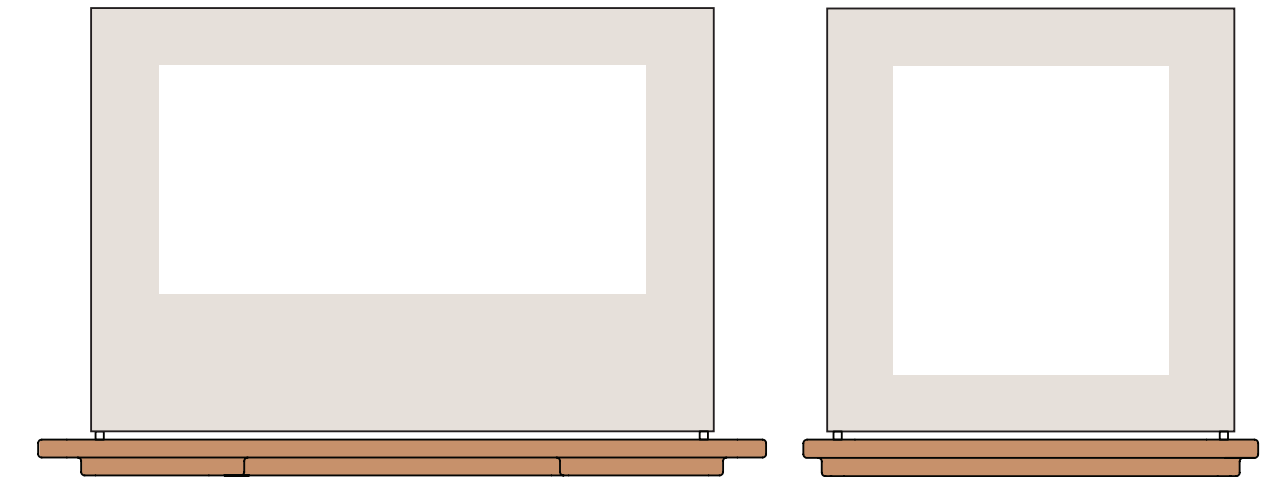
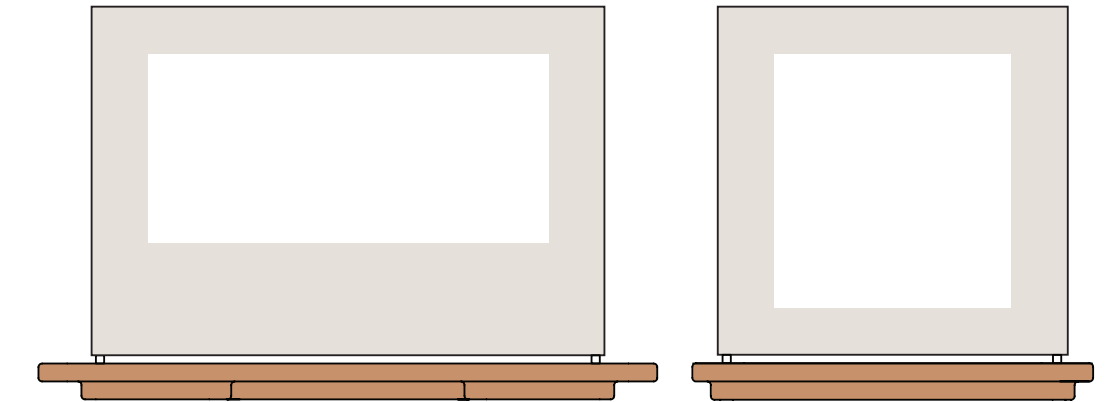
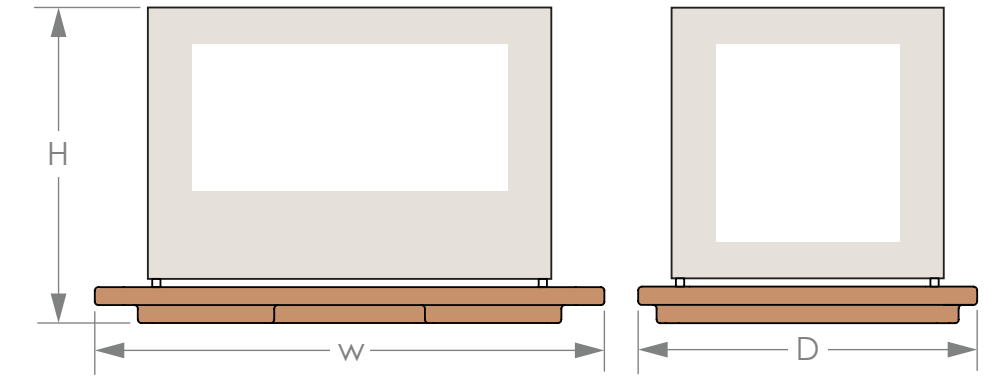
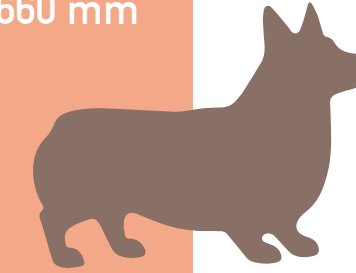
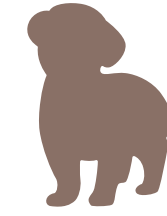
## Size Options

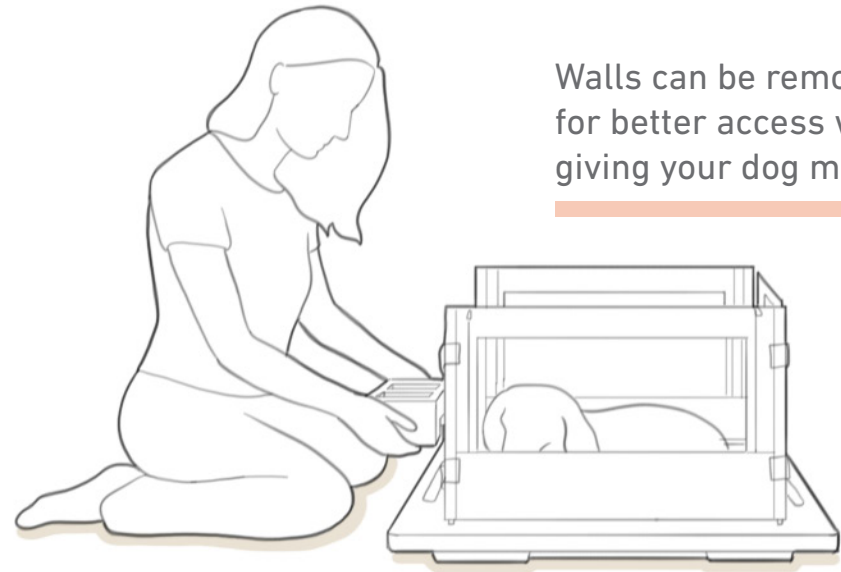
Small  
W 710 x H 440 x D 460 mm

Medium  
W 860 x H 550 x D 560 mm

Large  
W 1020 x H 650 x D 660 mm

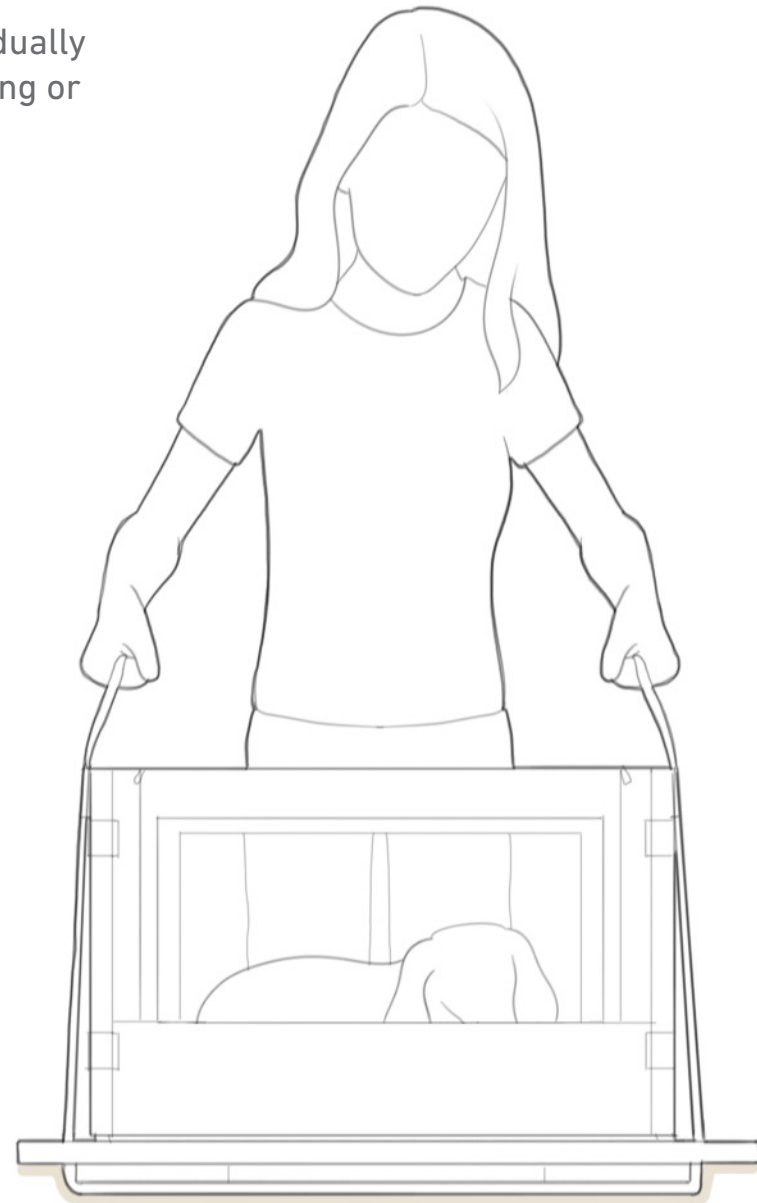
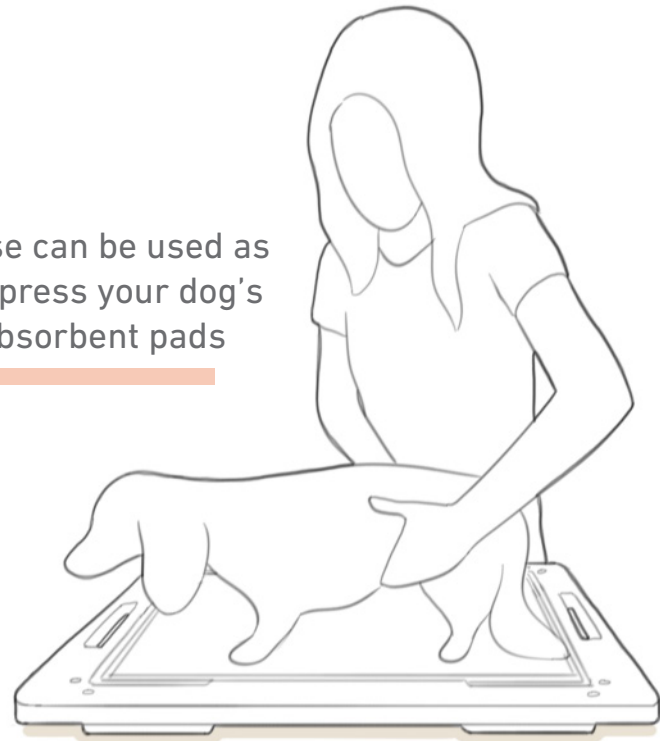
Spinal injuries like IVDD are more common in smaller dogs, but hip or knee injuries and heartworm treatment often require crate rest as well.





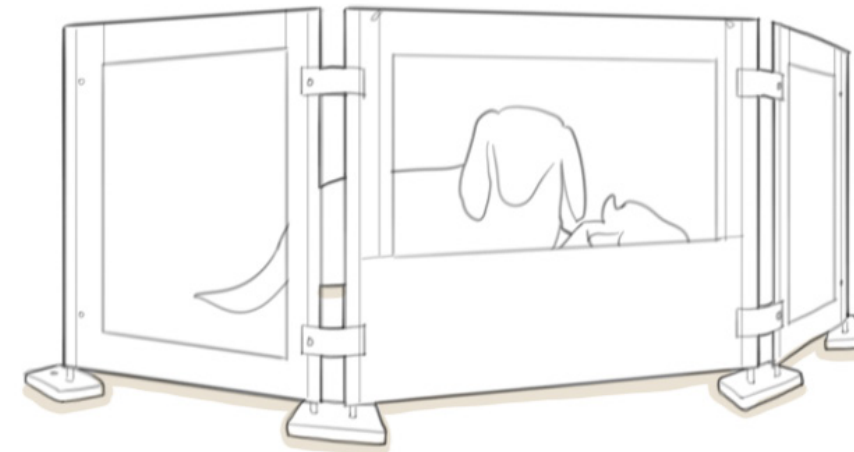
Walls can be removed individually for better access when feeding or giving your dog medicine

The plastic base can be used as a surface to express your dog's bladder over absorbent pads



Carry strap wraps securely around base, through handles

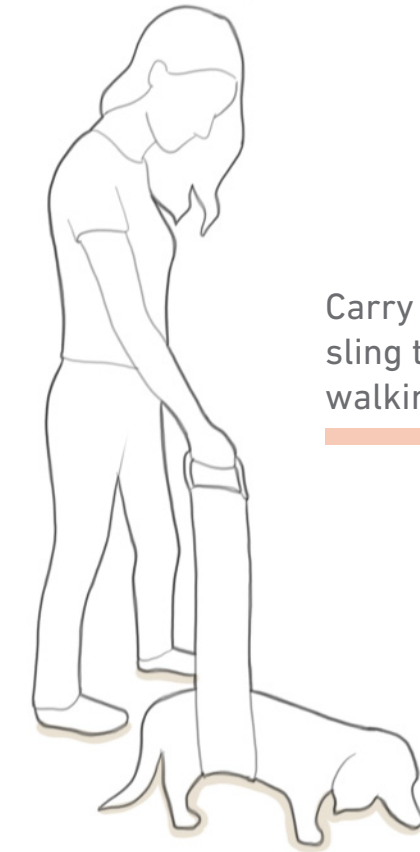
Walls can zip down for better accessibility while keeping your dog secure



Walls can be set up with free-standing bases to block off stairs or create a secure space

Having an injured dog is a stressful time, both for the dog and owner.

Balancing comfort and safety, this system adapts to your dog's and your needs to facilitate a positive healing process.



Carry strap can be used as sling to assist your dog in walking while they heal



“Although Emmie made a full recovery, I can’t always keep an eye on her and I worry about her getting injured again. This product brings me peace of mind that I am keeping her secure and comfortable.”

