



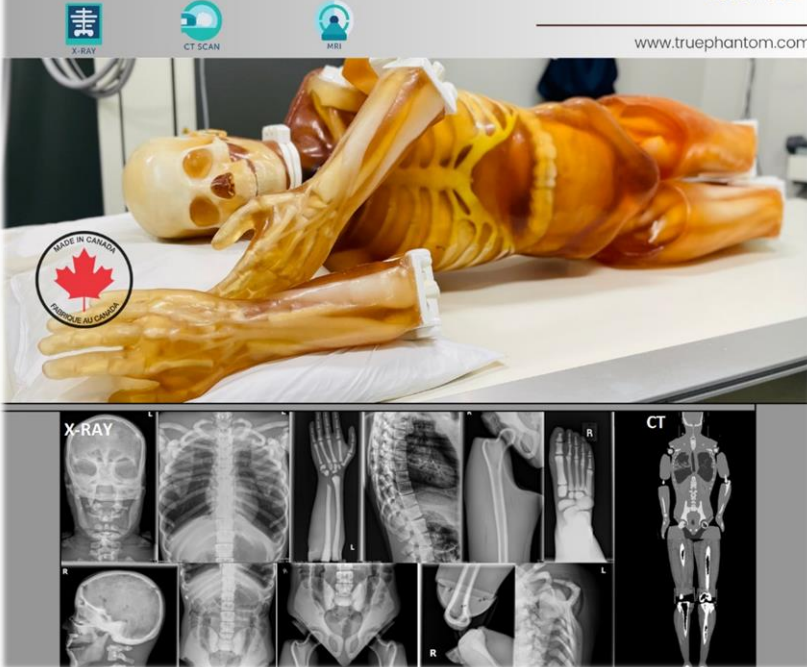
TRUE PHANTOM SOLUTIONS

**ADULT FULL BODY PHANTOM
FOR X-RAY POSITIONING,
CT AND MR IMAGING & TRAINING**



TRUE PHANTOM
SOLUTIONS

www.truephantom.com



User Manual

Adult Full Body (with Muscles) for X-Ray CT, MRI

[FB-A02]

VERSION 2.4 ■ 06 Mar 2024

info@truephantom.com ■ www.truephantom.com

Table of Contents

Description

Anatomy.....

Design

X-Ray Scans

CT Scans

MRI Scans.....

Technical Properties

Materials Used

Size and Weight of the Phantom.....

Included In Order.....

Handling the Phantom.....

Scanning Instructions

Storage and Handling

Cleaning

3

4

5

6

7

8

9

11

11

12

12

12

13

13

Description

Adult Full Body Phantom with Muscles is an X-Ray/CT and MRI-compatible training product. The primary application of this phantom is to train and demonstrate various patient positioning techniques in radiology. Other uses include hands-on experience with diagnostic imaging techniques and visual evaluation to find optimal scanning conditions.

In terms of MRI applications, the phantom tissues have realistic T2 relaxation time values, which makes this product the best fit for any T2-weighted MRI imaging methods. Very good results can also be achieved with proton-density imaging methods. The phantom can be still imaged with T1-weighted methods, but the T1 values are less realistic, and they are within the range of about 100 ms.

The model of this phantom is based on an adult male body that weighs about 70 kg (154 lb) and measures 175 cm (69 in) in height.

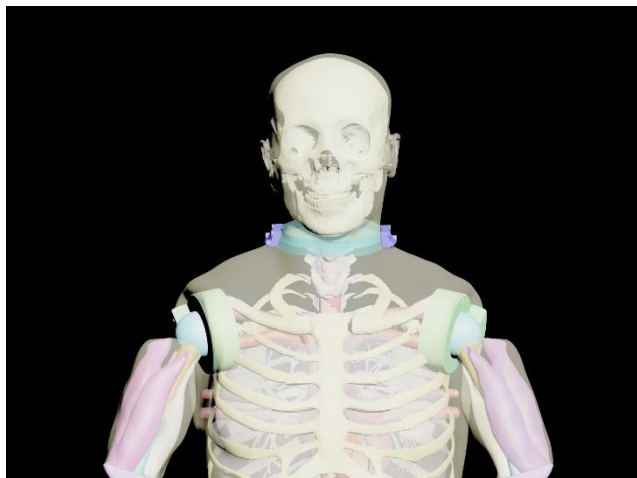
The skeleton is built from individually cast bones with a realistic three-layered structure with inner porosity. The properties and structures of the bones can be adjusted according to the requirements of the particular project. Upon request, the phantom is customizable with different pathologies such as lesions, tumors, infections, and abnormalities. This positioning phantom can be ordered in a translucent or skin-colored version.



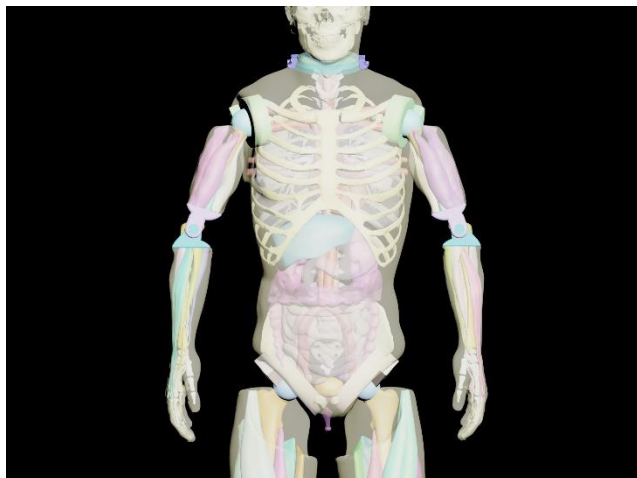
Anatomy

- ✓ Full Human Body (10 Parts)
- ✓ Realistic Body Tissue-Mimicking Material
- ✓ Rotatable Shoulders (360° Around and 180° Sideways)
- ✓ Movable Hip, Knee, and Elbow Joints
- ✓ Detachable Head, Torso, and Limbs
- ✓ Adult Head
 - Skull
 - Brain
 - Brain Tissue
 - Grey and White Matter
 - Air Cavities
 - Frontal Sinus with Air Gaps
 - Alignment Markings
- ✓ Adult Torso
 - Spine
 - Ribcage
 - Shoulders
 - Clavicles
 - Pelvis
- ✓ Torso Organs
 - Trachea
 - Heart
 - Lungs
 - Diaphragm
 - Liver
 - Gallbladder
 - Stomach
 - Kidneys
 - Spleen
 - Pancreas
 - Large and Small Intestines
 - Bladder
 - Prostate
- ✓ Adult Arms
 - Major Muscles
 - Humerus
 - Elbow Joints
 - Radius
 - Ulna
 - Wrist
 - Fingers
- ✓ Adult Legs
 - Major Muscles
 - Femur
 - Knee Joints
 - Tibia
 - Fibula
 - Foot
 - Toes
- ✓ Transparent or Skin-Mimicking Appearance

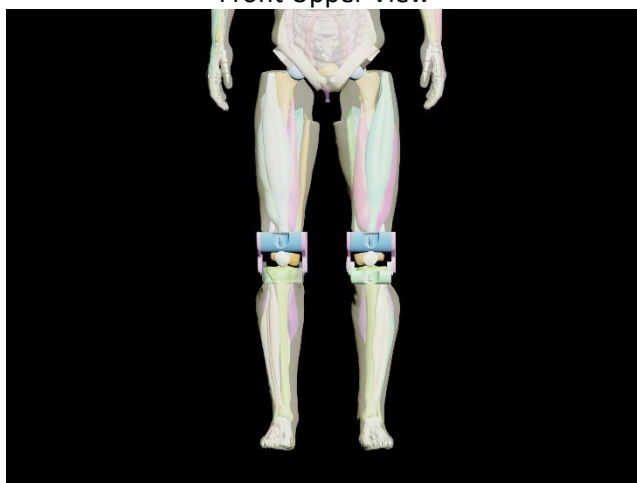
Design



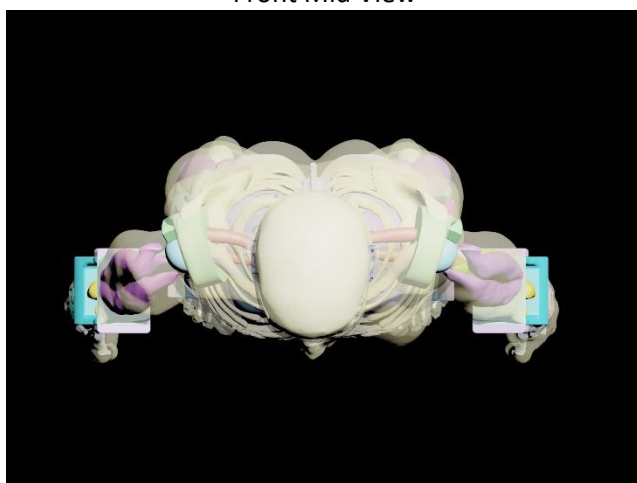
Front Upper View



Front Mid View



Front Lower View



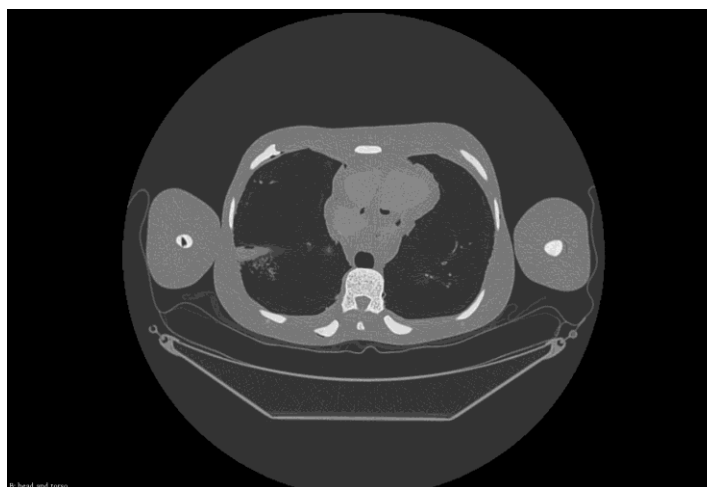
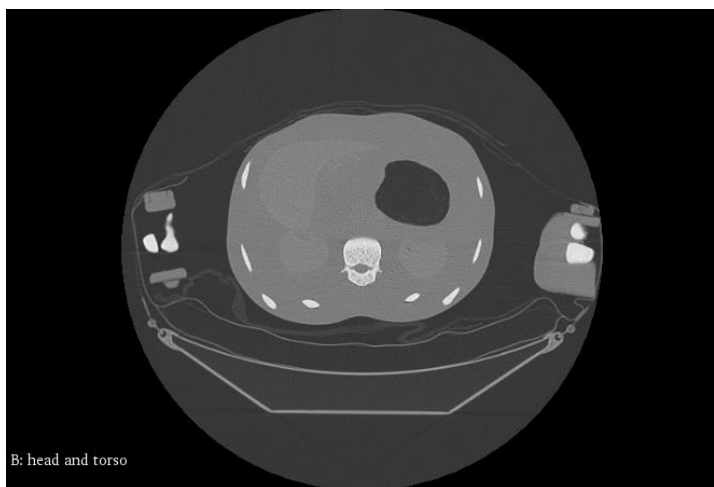
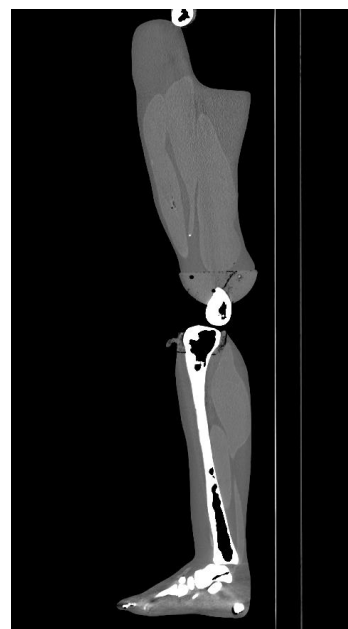
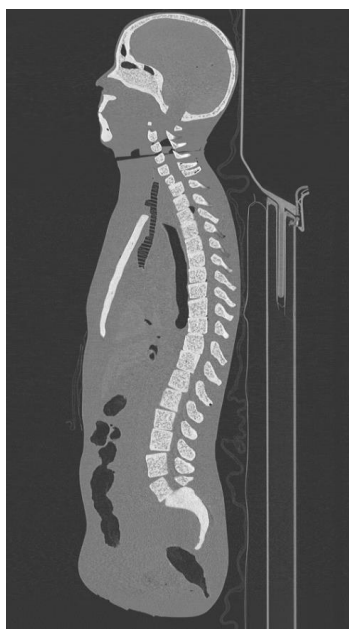
Top View

X-Ray Scans

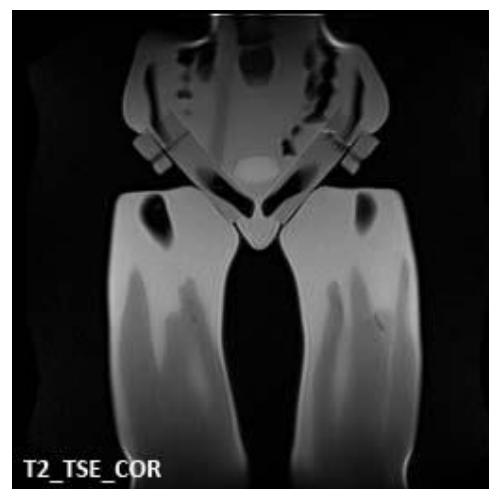




CT Scans



MRI Scans



Technical Properties

Type of Tissue	Sound Velocity[m/s]	Density [g/cm ³]	Attenuation Measured at 2.25 MHz [dB/cm]	Hardness [Shore OO]	T2 [ms]	Speckles
Organs with Speckles (liver, kidneys, etc.)	1400 ± 10	0.99	1.0 ± 0.2	20	70	VARIABLE
Organs without Speckles (stomach, intestines, etc.)	1400 ± 10	0.99	1.0 ± 0.2	20	70	NO
Body Tissue	1400 ± 10	1.00	1.5 ± 0.2	40	55	NO/LOW
Tumor Feature (Optional)	1400 ± 10	1.01	1.2 ± 0.2	30	65	YES
Cortical Bone	3000 ± 30	2.31	6.4 ± 0.3	N/A	N/A	N/A
Trabecular Bone	2800 ± 50	2.03	21 ± 2	N/A	N/A	N/A
Brain Matter	1400 ± 10	0.99	1.0 ± 0.2	20	70	YES
Brain White Matter	1400 ± 10	1.01	1.3 ± 0.2	35	60	YES

Muscle Tissue	1400 ± 10	1.01	1.3 ± 0.2	35	60	YES
---------------	-----------	------	-----------	----	----	-----

Thermal Properties of Bone-Mimicking Tissue

Thermal Conductivity	Volumetric Specific Heat Capacity	Thermal Diffusivity	Thermal Resistivity	Specific Heat	Speed of Sound
0.776 W/ m K	1.040 MJ/ m ³ K	0.746 mm ² / s	1.289 m K/ W	0.978 J/ g Deg Celsius	3070 m/s

HU Values of the Tissue Mimicking Materials

S.No.	Tissue Type	HU Value (average)
1	Body Tissue	-25
2	Brain Tissue	-25
3	Trabecular Bone	800
4	Cortical Bone	1300
5	Aorta	40
6	Vena Cava	40
7	Trachea	80 (Tissue Part), -1000 (Air Filled Part)

8	Pancreas	110
9	Spleen	110
10	Kidneys	110
11	Bladder	35
12	Rectum Wall	100
13	Sigmoid Colon Wall	100
14	Heart	40
15	Liver	110
16	Gallbladder	35

Materials Used

- ✓ Soft tissue and organs: Composition of urethane-based soft resin
- ✓ Synthetic bones: Patented ceramic-reinforced epoxy-based composite material

Size and Weight of the Phantom

- ✓ Phantom Size: 69 Inches, Weight: 154.4 Lbs (approx.).
- ✓ Shipment Size: 47 x 26 x 18 Inches, Weight: 198.5 Lbs (approx.)

Included In Order

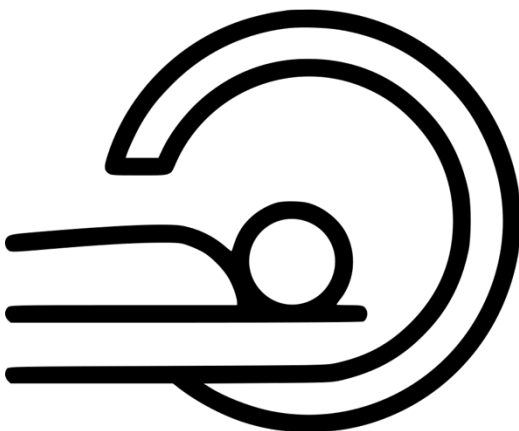
- ✓ Adult Full Body (with Muscles) Phantom
- ✓ User Manual/Assembly Instructions
- ✓ 2-Year Warranty & Unlimited Customer Service
- ✓ Hard Carry Case

Handling the Phantom



- **Handle with Care:** When lifting, carrying, or moving the phantom, use caution to avoid damage.
- **Two-Person Handling:** We recommended that two individuals handle the phantom together, ensuring secure and controlled movement.
- **Positioning the Phantom:** While moving the limbs of the phantom be cautious to avoid any damage to joints/connectors.
- **Proper Gripping Technique:** Hold the phantom firmly by its torso to maintain stability. Avoid any pulling or gripping of the arms, legs, or head.
- **Moving the phantom:** We suggest the use of a stretcher for carrying the phantom within the premises.

Scanning Instructions



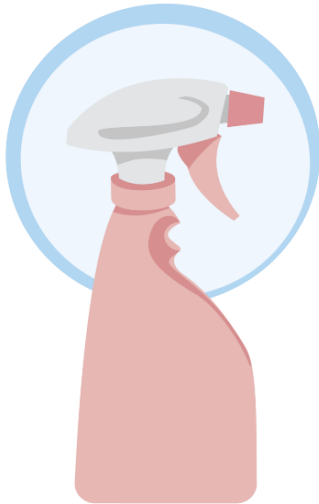
- The phantom is fabricated based on the anatomy of the real human body. It can be scanned per the standard protocols used while positioning a real person.
- The phantom can be put in horizontal and vertical positions for scanning purposes.
- Anterior, Lateral, and Posterior techniques can also be performed.

Storage and Handling



- The phantom is made of urethane-based material and should be protected from direct exposure to any intense UV light.
- The experiments conducted on the phantom can be performed in a sunny lab, but leaving the phantom under direct sunlight for weeks or months is not recommended. If the phantom is not in use, we strongly recommend storing it in a dry and dark place or covering it with a plastic sheet/foil.

Cleaning



- The phantom is water-resistant and can be cleaned after use. It is ideal for cleaning it either with water or with soapy water.
- It is also quite resistant to chemicals, but if stronger solvents are meant to be used with the phantom, we recommend doing a small test on the bottom part of the neck or legs. The phantom should be placed on its belly, and the chosen solvent can be applied on a small, selected surface of the phantom for a few hours. If there is no visible effect on the phantom's surface, it is safe to assume that the phantom is resistant to the tested chemical, and it is safe to use it for the rest of the phantom. In other cases, avoid the solvent or contact us for alternatives.