In the hospital entrance, a distinct decontamination area should be set up promptly. Separation between clean and contaminated areas is essential. Medical personnel in contaminated areas should wear protective gear, as noted above, and should be rotated in their assignments every 1–2 h to ensure minimal exposure to radiation. If patients are critically wounded and require either surgery or resuscitation, they need to be transported directly to "contaminated" operating rooms or resuscitation sites for lifesaving procedures. Once the condition of such patients is stable, they should be decontaminated. It is important to obtain details concerning the exposure, to look for prodromal signs of radiation sickness, and to conduct a physical examination. One of the simplest ways to estimate exposure clinically is to measure the time of prodromal appearance. The earlier the prodromal signs and symptoms appear, the higher is the dose of radiation exposure. A few laboratory tests need to be done routinely, such as complete blood count and urinalysis. If internal contamination is suspected, specific treatment should be given as outlined below.

TREATMENT RADIONUCLIDE CONTAMINATION

Table 263e-2 summarizes the common treatment regimens for internal radionuclide contamination. Treatment for internal radionuclide contamination, also referred to as *decorporation*, should be started as soon as possible after suspected or known exposure. The approximate upper limit of radionuclide contamination that can reasonably be ignored from a radiation safety point of view is not well defined. These are judgments that will depend on the circumstances of the event and the resources available. The Clinical Decision Guide within the National Council on Radiation Protection and Measurements (NCRP) Report 161 is a decision tool for determining the need for treatment of a contaminated person. Purchase of these volumes by major triage centers (available at *http://www.ncrppublications.org/Reports/161_I*) may be a prudent investment that would help health care workers in a critical situation to determine which patients should undergo decorporation.

The goal is to leave the smallest amount of radionuclide possible in the body. Treatment is given to reduce absorption and enhance elimination and excretion. Some decorporation agents are not approved by the U.S. Food and Drug Administration (FDA) for these indications, and few clinical data support the efficacy of their use.

The gastrointestinal tract may be cleared by stomach lavage, with emetics (such as apomorphine, 5–10 mg; or ipecac, 1- to 2-g capsules or 15 mL in syrup), or by use of purgatives, laxatives, ion exchangers, and aluminum antacids. Prussian blue (1 g tid for a minimum of 3 weeks) is an ion exchanger used to treat cesium-137 internal contamination. Aluminum antacids (such as aluminum phosphate gel) may reduce strontium uptake in the gut if given immediately after exposure. Aluminum hydroxide is less effective.

Radionuclide interaction with tissues can be prevented or reversed through use of agents that block absorption; dilute, mobilize, or release radionucleotides from tissues; or chelate radionucleotides.

TABLE 263e-2 COMMON DRUGS[a] FOR TREATMENT OF INTERNAL RADIONUCLIDE CONTAMINATION

Medication	Administered for Radionuclides	Route of Administration	Dosage	Duration	Mechanism of Action
KI	^{131}I	PO	130 mg/d for adults >40 with thyroid exposure >500 cGy, for adults 18–40 with thyroid exposure >10 cGy, and for pregnant or lactating women with thyroid exposure >5 cGy; 65 mg/d for children and adolescents 3–18 with thyroid exposure >5 cGy; 32.5 mg/d for infants 1 mo to 3 y with thyroid exposure >5 cGy; 16 mg/d for neonates from birth to 1 mo with thyroid exposure >5 cGy	7–14 d	Blocking agent
Zn-DTPA	Plutonium, *trans*-plutonium, yttrium, americium, curium	IV	1 g in 250 mL NS or 5% glucose, given over 1–2 h or as a bolus over 3–4 min	Up to 5 d	Chelating agent
		Inhalation	1 g in 1:1 dilution with water or NS over 15–20 min		
		IM	1 g; not recommended because of pain		
Ca-DTPA	Plutonium, *trans*-plutonium, yttrium, americium, curium	IV	1 g in 250 mL NS or 5% glucose, given over 1–2 h or as a bolus over 3–4 min	Up to 5 d	Chelating agent
		Inhalation	1 g in 1:1 dilution with water or NS over 15–20 min		
		IM	1 g; not recommended because of pain		
Bicarbonate	Uranium	IV	2 ampoules $NaHCO_3$ (44.3 meq each, 7.5%) in 1000 mL NS, 125 mL/L; or 1 ampoule $NaHCO_3$ (44.3 meq, 7.5%) in 500 mL NS, 500 mL/h	Usually IV for the first 24 h, PO for additional 2 d; continuation of treatment for >3 d is rare and is based on titration of uranium amounts in the body	Increased excretion via the kidneys
		PO	2 tablets q4 h until urine pH = 7–8, or 4 g (8 tablets) tid		
Prussian blue	^{137}Cs	PO	1 g tid with 100–200 mL water, up to 10 g/d	3 wk titrated by urine and fecal bioassay and whole-body counting	Ion exchanger
Water	Tritium (^{3}H)	PO	>3–4 L/d	3 wk	Excretion of water
Aluminum phosphate gel	Strontium	PO	100 mL immediately after exposure	Once	Decreased gut absorption
Aluminum hydroxide	Strontium	PO	60–100 mL	Once	Decreased gut absorption

[a]Except for KI and Prussian blue, these drugs had not been approved for this purpose by the U.S. Food and Drug Administration at the time of publication.

Abbreviation: NS, normal saline.