Hospital preparedness assessment tool in the face of nuclear-radiation threats

Introduction:

The present tool is a researcher-made checklist (Heidranloo and Esmaeili) designed to evaluate hospital preparedness in the face of nuclear and radiation incidents, in 6 domains (physical infrastructure, pharmaceuticals and equipment, nuclear-radiation standards and indicators, human resources, communication and inter-organizational coordination) and includes the following:

1. The " physical infrastructure" domain of hospital preparedness evaluation checklist has been designed to include 10 items numbered 1 to 10.
2. The evaluation checklist for the " pharmaceuticals and Equipment" domain of hospital preparedness has been designed to include 18 items numbered 11 to 28.
3. The evaluation checklist for the "Standards and Indicators" domain of hospital preparedness has been designed to include 19 items numbered 29 to 47.
4. The evaluation checklist for the "human resources" domain of hospital preparedness has been designed to include 5 items from number 48 to 52.
5. The evaluation checklist for the "Communications" domain of hospital preparedness has been designed to include 7 items, numbered 53 to 59.
6. The evaluation checklist for the " inter-organizational coordination " domain of hospital preparedness has been designed to include 11 items from numbers 60 to 70.

Guide to completing the tool:

Scoring:

The checklist items were weighted and scored using the opinions of experts in the field of disaster health.

Scoring method:

A score of 1 to 5 is considered, ranging from no program to program revision.

Determining the tool cutoff point:

Considering the total number of comments on 70 questions based on a 5-point Likert scale, the highest score will be 350 and the lowest score will be 70.

In this tool

- scores of 0-70 indicate very poor preparation
- scores of 140-71 indicate poor preparation
- scores of 210-141 indicate average preparation
- scores of 280-211 indicate good preparation
- scores of 350-281 indicate very good preparation.

The preparedness level of the tool is also calculated and reported in percentages as follows:

- 0-20% Very poor preparedness score
- 20-40% Poor preparedness score
- 40-60% Average preparedness score
- 60-80% Good preparedness score
- 100%-80% Very good preparedness score

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Dimensions	No.	items	Very poor	Poor	Average	Good	Very good
physical infrastructure	1	A safe and standard triage space is provided for Nuclear-radioactive events.					
	2	A safe and standard route is provided from the triage site to the decontamination site.					
	3	A standard physical space is provided for decontamination.					
	4	A safe and standard route is considered from the decontamination space to the clean space (bed).					
	5	The entrance to the decontamination room for nuclear-radiation injured					

		patients is separate from other patients.					
	6	The sewage of the decontamination room is separate from the municipal sewage.					
	7	The ventilation of the decontamination room is separate from the ventilation of the entire hospital.					
	8	White warning tapes have separated the zoning (hot-warm-cold).					
	9	A specialized care team for radiation exposed trauma patients has been established and is operational in the emergency department.					
	10	A dedicated nuclear and radiation casualty emergency department equipped with a positive-pressure ventilation system has been established and is operational.					
pharmaceuticals and Equipment	11	As a reception center for nuclear-radiation casualties, a dedicated CBRNE casualty ambulance has been established and is operational.					
	12	Appropriate personal protective equipment (PPE) is available for dealing with nuclear-radiation casualties. (Gloves, masks, clothing, boots, disposable gowns, protective glasses, shoe covers, special adhesives, etc.)					
	13	There are devices specifically for environmental radiometry of various types of radiation.					
	14	There are devices for individual radiological measurements of various types of radiation.					
	15	There are tags for triage of nuclear-radiation casualties.					
	16	There are necessary tools and equipment for decontamination of building surfaces.					
	17	There are necessary tools and equipment for decontamination of the injured.					
	18	A special decontamination shower is provided in the decontamination room.					

	19	Appropriate and standard flooring is provided in the triage-decontamination and hospitalization areas.					
	20	Special bins for collecting contaminated items have established and are operational.					
	21	Special garbage bags for carrying contaminated items have established and are operational.					
	22	Portable toilets for patients have established and are operational in the decontamination room.					
	23	Are there sufficient amounts of antibiotics?					
	24	Are there sufficient amounts of antidotes?					
	25	Are there sufficient amounts of corticosteroids?					
	26	Are there sufficient amounts of bone marrow stimulants?					
	27	Is standard communication equipment in the face of nuclear-radiation accidents available and operational? (walkie-talkie-wireless-satellite phone, etc.)					
	28	Are radiation detection devices subject to quality assessment every 6 months?					
Standards and Indicators	29	Is a hospital plan for EWS available and operational?					
	30	Is a hospital plan for HCC available and operational?					
	31	Is a hospital plan for EOC available and operational?					
	32	Is a hospital plan for triage of casualties available and operational?					
	33	Is a hospital plan for decontamination available and operational?					
	34	Is a hospital plan for increasing hospital capacity available and operational?					
	35	Is a hospital plan for safety available and operational?					
	36	Is a hospital plan for security available and operational?					
	37	Is a hospital plan for exercises and maneuvers (operational roundtables)					

		available and operational?					
	38	Is a hospital plan for HICS (four boxes) (operations-planning-support-financial administration) available and operational?					
	39	Is a dedicated workshop on general radiation awareness available and operational?					
	40	Is a hospital plan for human resource recruitment available and operational?					
	41	Is a hospital plan for storage and maintenance of radioactive materials in the hospital available and operational?					
	42	Is a hospital plan for standard disposal of waste and nuclear-radioactive decontamination waste available and operational?					
	43	Is a hospital plan for inventory of risks related to nuclear-radioactive accidents available and operational?					
	44	Is a hospital plan for emergency evacuation available and operational?					
	45	Is a hospital plan for treatment guidelines for nuclear-radiation casualties available and operational?					
	46	Is a hospital plan for corpse management available and operational? Extended Mortuary					
	47	Is a hospital plan for worried wells available and operational? Worried Well Mass Hysteria					
human resources	48	Is a rapid response team for responding to nuclear-radiation incidents available and operational?					
	49	Is the training of the rapid response team and HICS system members updated every six months?					
	50	Is a semi-annual table-top exercise for personnel on all radioactive materials conducted and operational?					
	51	Is the psychosocial counseling team for nuclear-radiation casualties					

		available and operational?					
	52	Is a specialized nuclear medicine team in the hospital available and operational?					
Communications	53	Is a hospital plan for CCTV systems in operational control and management available and operational?					
	54	Is a plan for EOC multi-layer communications (telephone, internet, wireless, satellite phone, mobile, fax, pager and courier) available and operational?					
	55	Is a hospital plan for communicating services and emergency procedures to patients, companions, and visitors via the dedicated core channel available and operational?					
	56	Is the documentation of nuclear-radiation accidents available and operational?					
	57	Is the method of communicating with the media in nuclear-radiation emergencies available and operational?					
	58	Is the method of referring and transferring nuclear-radiation casualties to other medical centers available and operational?					
	59	Is a hospital plan for HICS members to Communication with each other and in the face of nuclear-radiation accidents available and operational?					
inter-organizational coordination	60	Is the hospital's memorandum of understanding with the Atomic Energy Organization available and operational?					
	61	Is the hospital's memorandum of understanding with the Parent university’s EOC available and operational?					
	62	Is the hospital's memorandum of understanding with the police available and operational?					
	63	Is the hospital's memorandum of understanding with the MRRT (Military Rapid Response Team) available and operational?					
	64	Is the hospital's memorandum of understanding with the Passive					

		Defense Organization available and operational?					
	65	Is the hospital's memorandum of understanding with the Crisis Management Organization available and operational?					
	66	Is the hospital's memorandum of understanding with the fire department available and operational?					
	67	Is the hospital's memorandum of understanding with the Red Crescent available and operational?					
	68	Is the hospital's memorandum of understanding with the nearest neighboring hospital available and operational?					
	69	Is the hospital's memorandum of understanding with the hospital involved in nuclear-radiation incidents available and operational?					
	70	Is the hospital's memorandum of understanding with the accrediting university EOC available and operational?					