



The Role of Radiation Health Research Institute in the case of NPPs' accident

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Korea Hydro & Nuclear Power
Radiation Health Research Institute



Radiation Health Research Institute

Research Institute affiliated in KHNP

Established

- ▶ To Prepare the radiation emergency medical system for the NPP accidents
- ▶ To Evaluate the health effects of radiation exposure scientifically

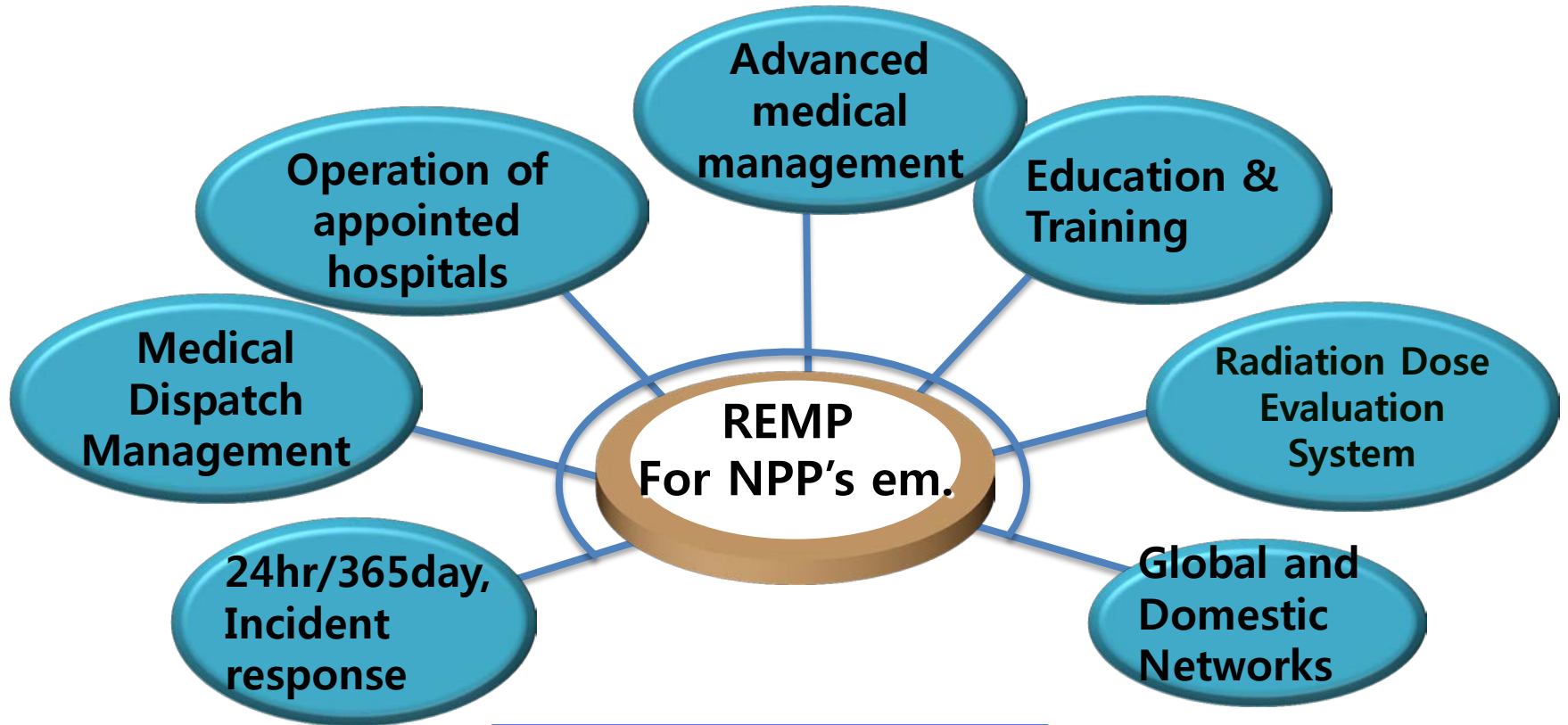
- ▶ Preparing the radiation emergency medical system for the NPP accidents
- ▶ Studying the health effects of radiation exposure
 - Study on : radiation epidemiology
 - low dose radiation effect
 - health physics



Radiation Emergency Medical Preparedness & Response for the NPP's Emergency

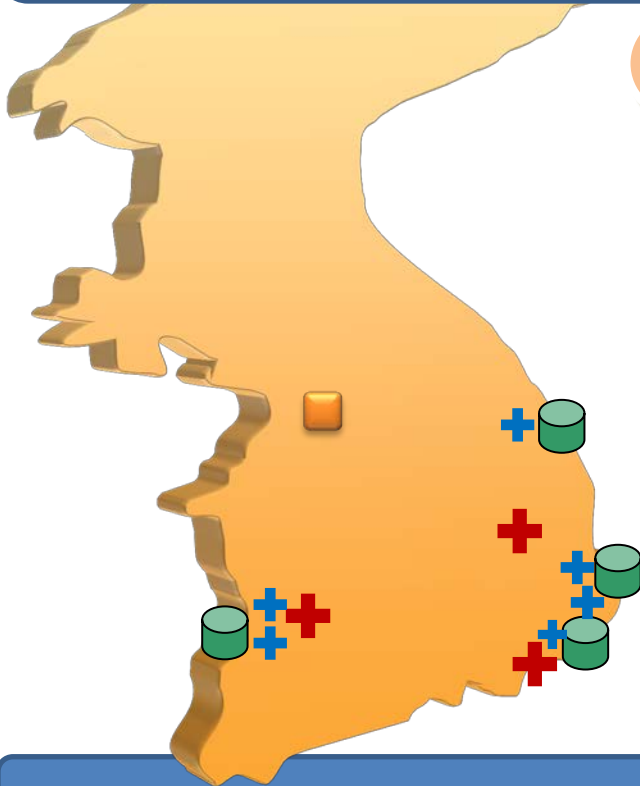


Radiation Emergency Medical Preparedness System for NPPs' accident



Area H
radiation

Every NPP site has primary & Secondary appointed hospitals(9) for the emergency



Primary +

- Located 15~20 minutes apart from NPPs by car
- Emergency medical treatment for the NPP workers
- Transferring over exposed patients to the 2ndary hosp &RHRI

2ndary +

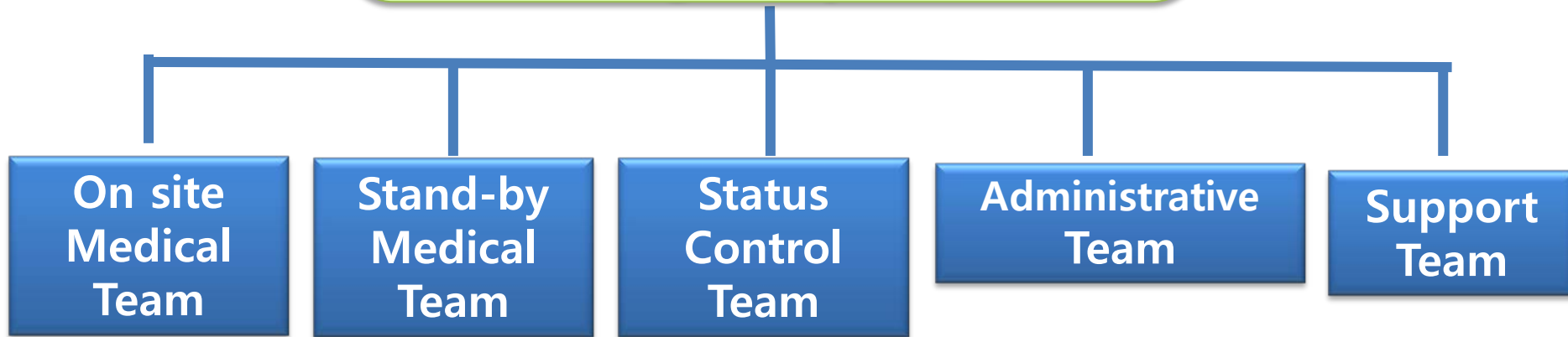
- The University Hospital in the NPP region
- Equipped with stem cell transplantation facility
- Treatment more serious patients

RHRI supports to the appointed hospitals

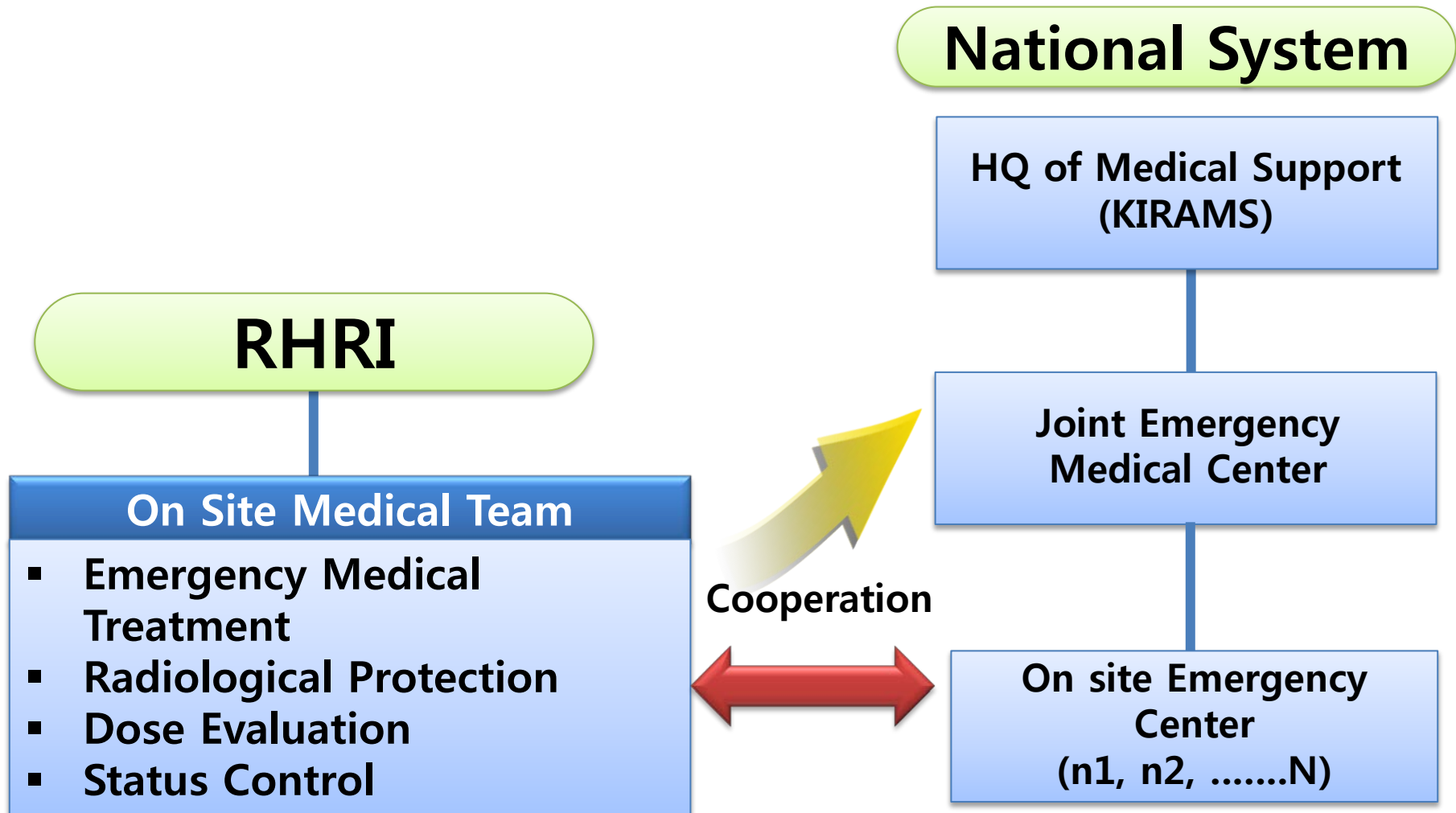
- Education/ training for radiation emergency treatment
- Applying Essential Item for treating radiation accident victim
 - Isolation rooms, Decontamination equipments & protective equipment
- Financial support for developing REMP capabilities
- Medical counseling in case of radiation accident occur

Organization of RHRI in NPP Emergency

Emergency RHRI



Organization of RHRI in NPP Emergency



Treatment flow of Radiation accident victim in NPP

First Aid



On site

Medical Tx



Appointed
Hospital

- Isolation Room
- Air filter system
- Drainage system

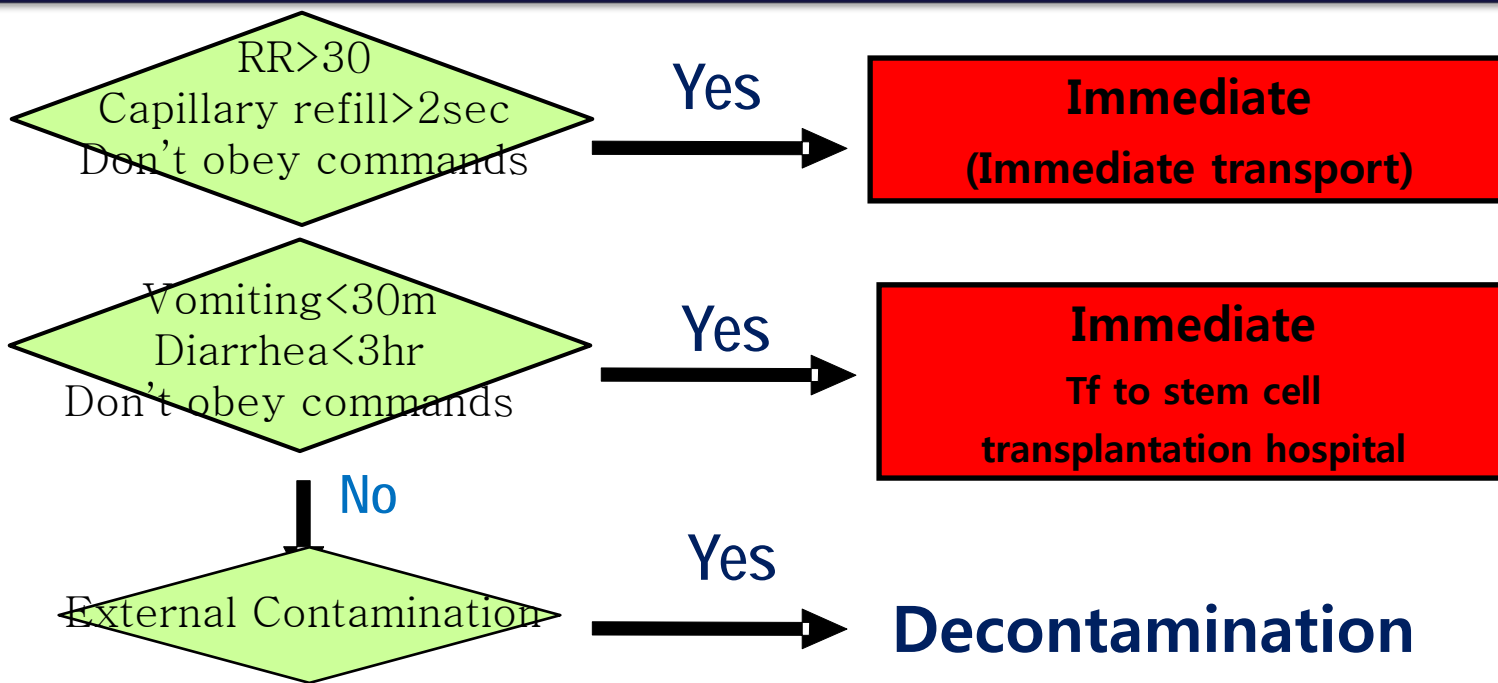
Advanced Tx (esp, Internal Decorporation)



RHRI

Tele-
Consultation

TRIAGE algorithm for radiation accident victim



Delayed

Minor

Expectant

Trauma

Serious injuries

Walking wounded

Unlikely to survive

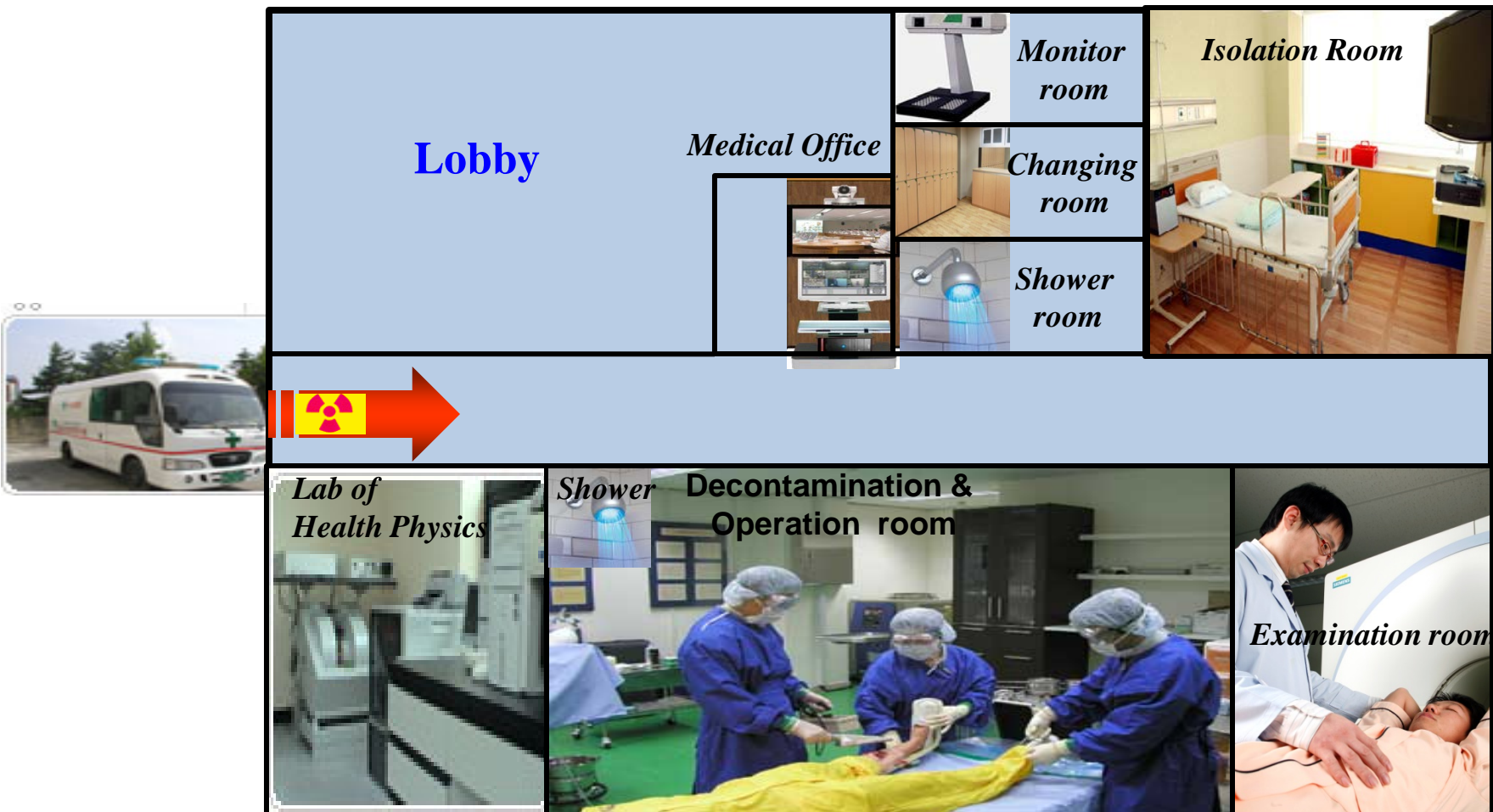
Radiological
Exposure

Stimulation therapy
- Vomiting < 1hr
- Headache

Supportive Care



Flow for Radiation accident victim in RHRI



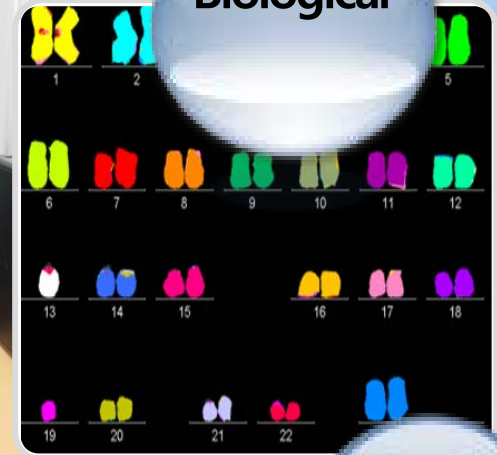
Radiation Dose Evaluation System of RHRI, KHNP

Physical

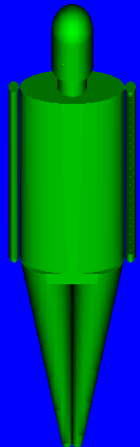


Radiation Dose Evaluation System

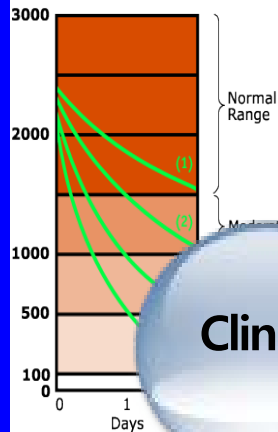
Biological



Korean Phantom study

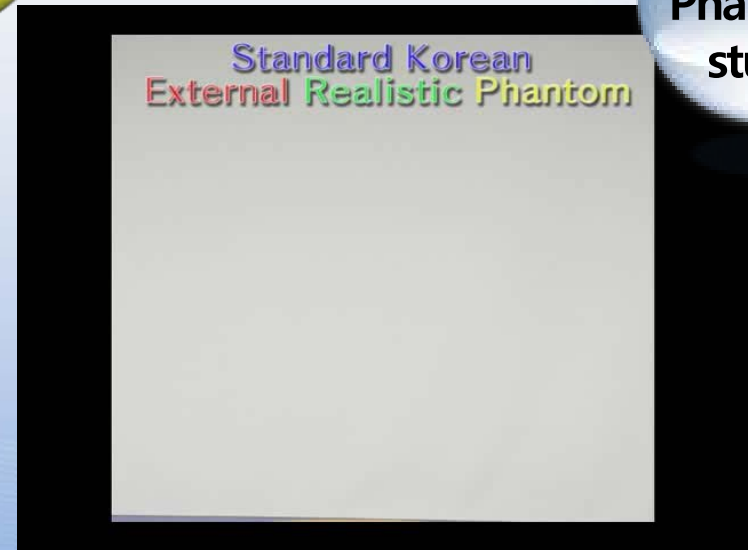


Mathematical

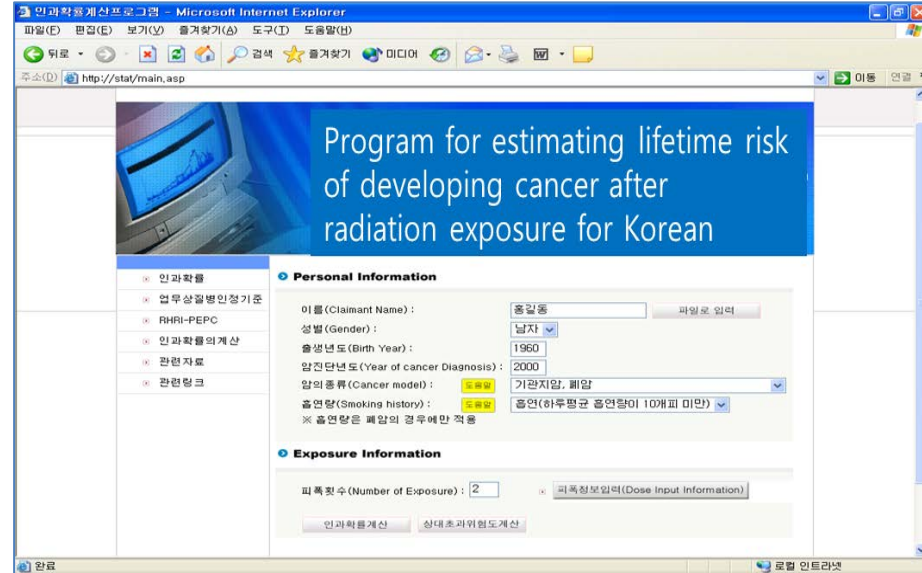
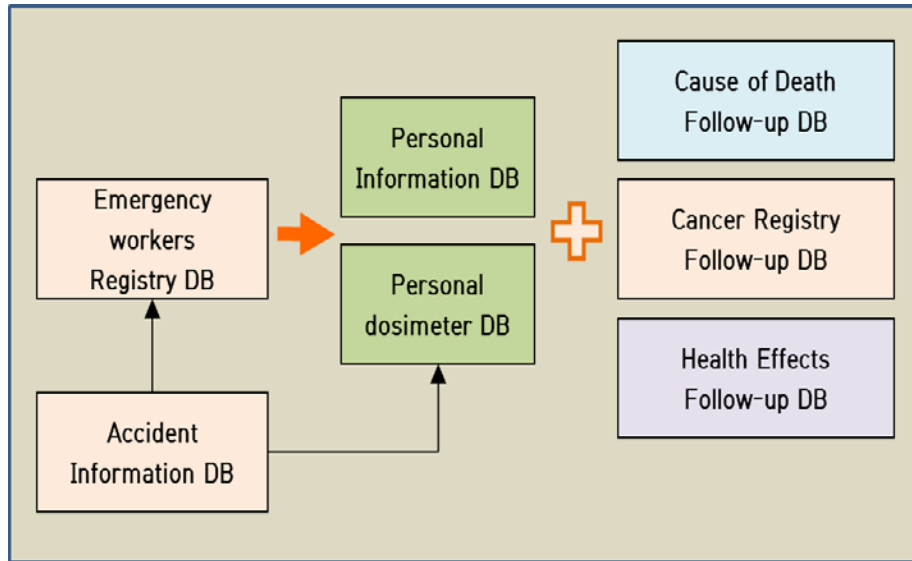


Clinical

Standard Korean External Realistic Phantom



Health Risk Assessment in Radiation Emergency



Epidemiological survey for emergency workers & victims

Lifetime risk estimation based on radiation dose



Study on Health Effects of NPP workers



Comprehensive Health Evaluation

Assessment



Health Examination

- Act based practice
- About 300 items

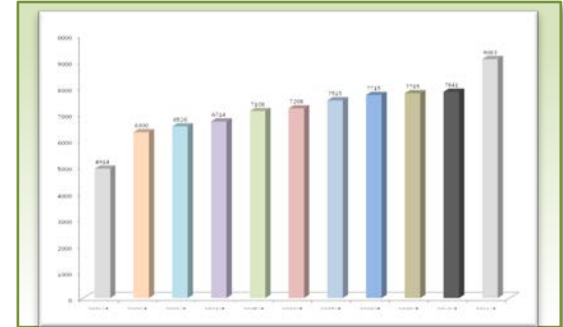
Analysis



Health Surveillance

- Clinical evaluation
- High risk group selection

DB



DB Construction

- Construction of health examination DB
- Biological Material Bank

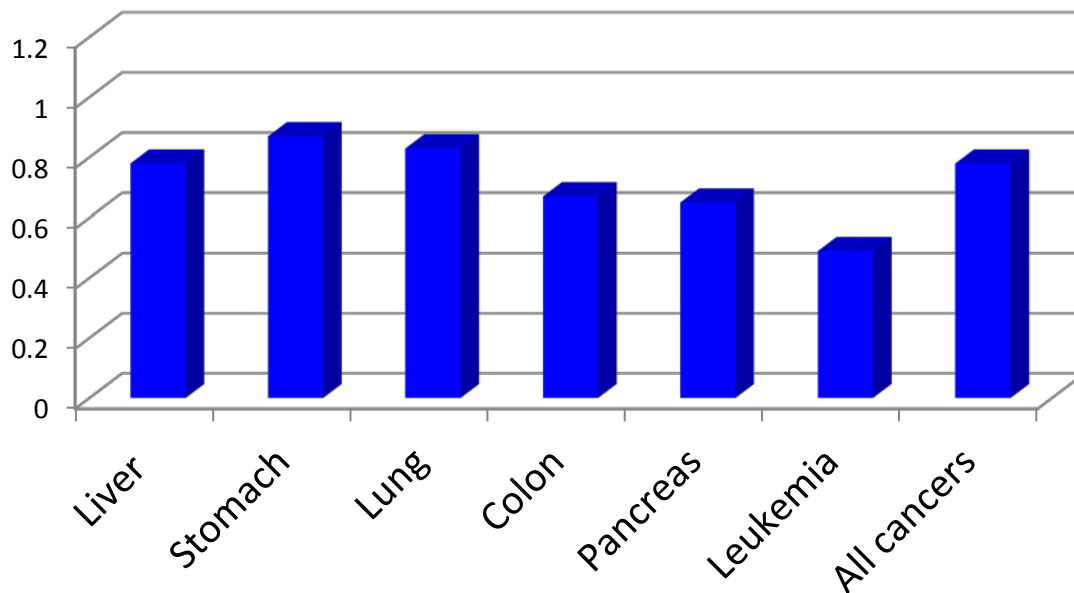
Health Management & Research on Disease Incidence



Epidemiological Study for NPP workers in Korea

- Korean NPP workers cohort
 - Total N=49,510 (1977~)
- Epidemiological study (1990~)
- IARC 15-country collaborative study

Standardized Mortality Ratio in cancer



**Lower cancer rates
in NPP workers
compared to general
population**



Evaluation of Occupational Disease (cancer) for NPP workers

RHRI-PEPC (Probability of Causation)

원전피폭 첫 '산업재해' 인정



입력 : 2001.01.31 15:27

원전관련 방사능 피폭을 산업재해로 인정하는 첫 국내 판정이 나온 것으로 밝혀졌다.

근로복지공단은 이달초 피폭 후 급성 골수성 백혈병을 앓다 사망한 원자력발전소 종사자 정모씨의 산업재해를 인정, 1억3천여만원을 보상하라는 판정을 내렸다고 한나라당 신영국 의원이 31일 관계기관의 자료를 인용해 밝혔다.

의료기관 등에서의 방사능 피폭에 대한 보상판정은 사례가 있으나 원전 종사자의 피폭을 산재로 인정한 것은 처음있는 일이다.

First compensation for occupational disease of NPP workers (2001)

인과확률 계산 프로그램 RHRI-PEPC는 방사선작업종사자에게서 발생한 암에 대한 인과확률(Probability of Causation)을 추정하기 위한 프로그램으로, 미국 NCI와 CDC에서 발표한 암위험률모형에 근거하여 한국인에 적합한 인과확률 계산을 제공해 준다. 본 프로그램은 한국수력원자력(주) 자체 연구개발로 개발하여 운영하고 있다.

문의: 방사선보건연구원 통계역학연구실
Tel) 02-3499-6651 Fax) 02-3499-6660

- Program to evaluate occupational disease (cancer) for Korean NPP workers
- Support a nationwide occupational disease evaluation system

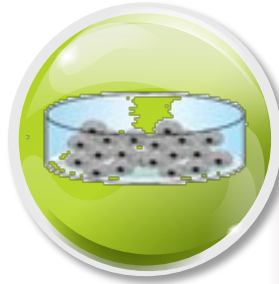


Low Dose Radiation Effect Research

Low dose irradiation



High dose irradiation



Cell

- Cell survival effects
- Immune activation
- Protection mechanism

Animal

- Life span/Aging
- Animal disease model
- Disease therapy tech.

Npp workers

- Chromosomal Aberration
- Individual radio



New Planned Proposal of REMP after Fukushima accident by KHNP

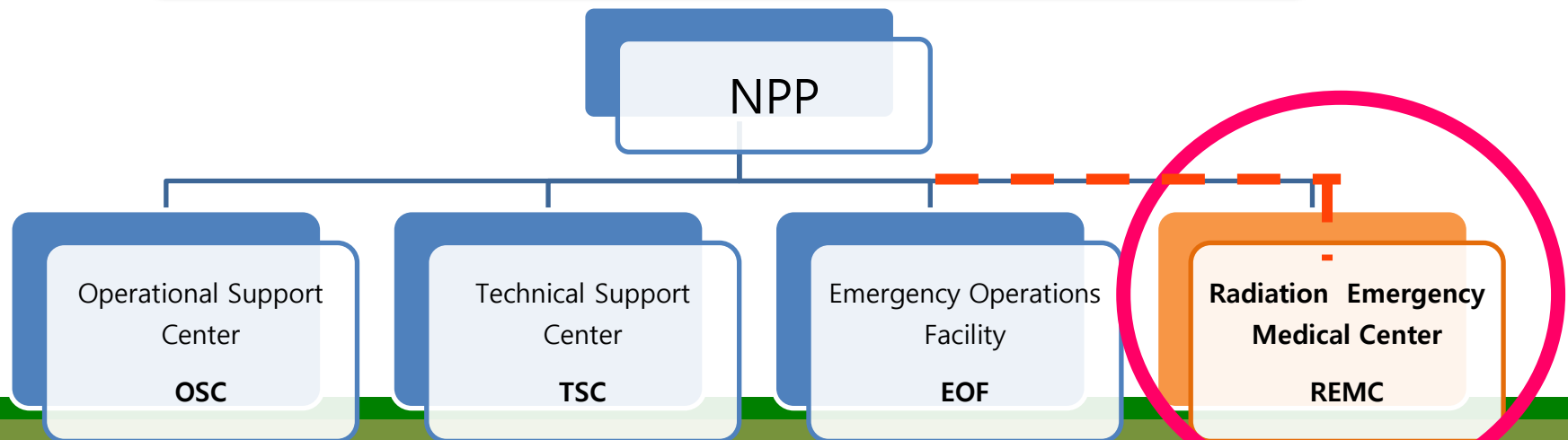


New Organization of REMP System

Radiation Emergency Medical Center at every NPP site

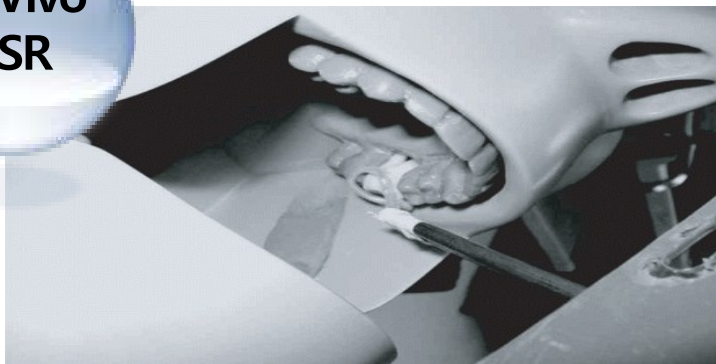
- Composed of 6 medical personnel in each NPP site.
- Normal : Perform Intensive Health Management for NPP workers
- Emergency : Perform Radiation Emergency Medical Treatment for workers

Emergency Response Facility of NPP



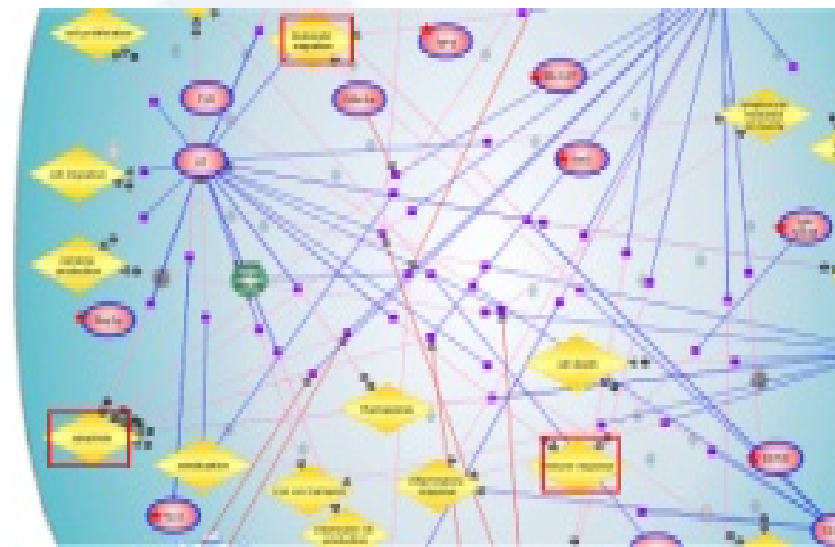
Radiation Dose Evaluation System for the Large Scaled Accident

In-Vivo
ESR



Mobile
WBC

Genomic
Biodosimetry





Thank you



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