



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

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Korea Hydro & Nuclear Power Co., Ltd.**



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

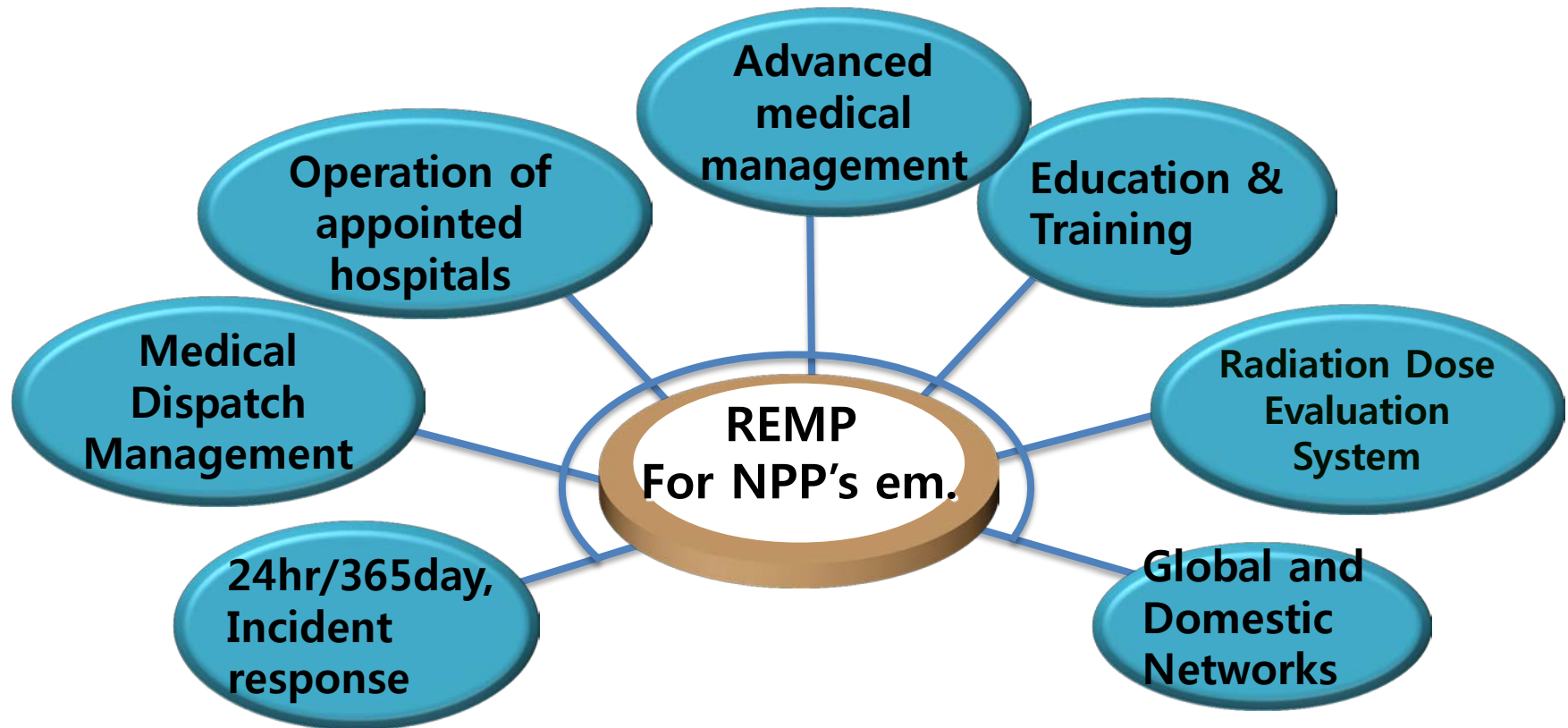
- ▶ Preparing the radiation emergency medical system for the NPP accidents
- ▶ Studying the health effects of radiation exposure
 - Study on : radiation epidemiology
low dose radiation effect
health physics



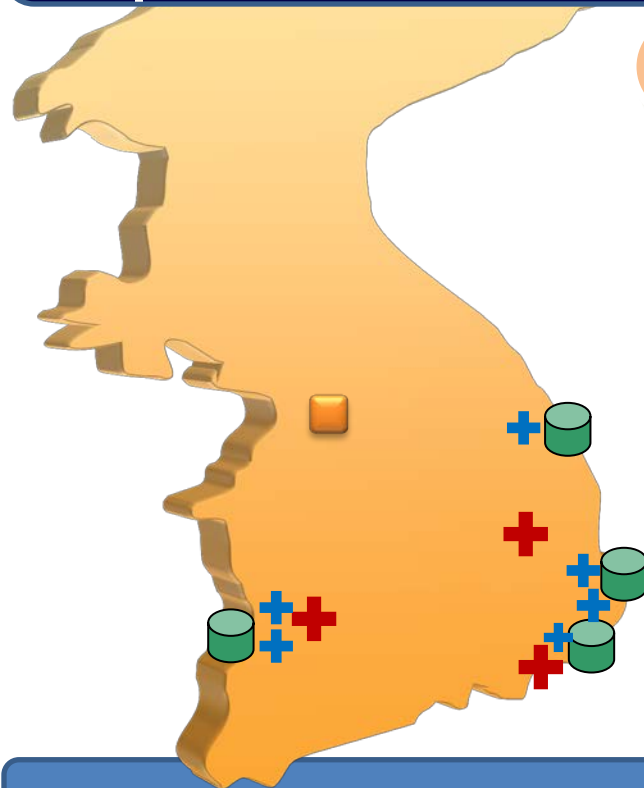
Radiation Emergency Medical Preparedness & Response **for the NPP's Emergency**



Radiation Emergency Medical Preparedness System for NPPs' accident



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 +

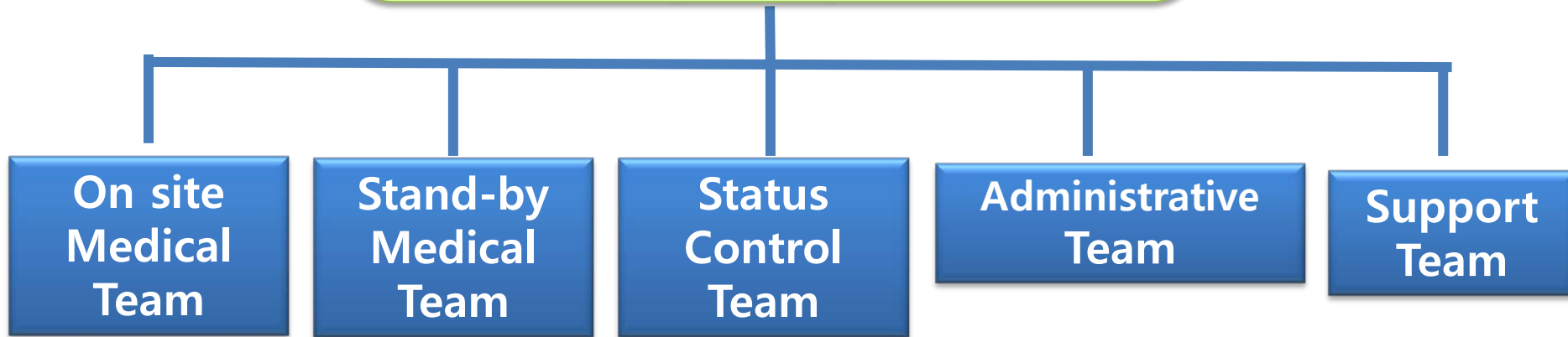
- The University Hospital in the NPP region
- Equipped with stem cell transplantation facility
- Treatment more serious patients

RHRI supports to the appointed hospitals

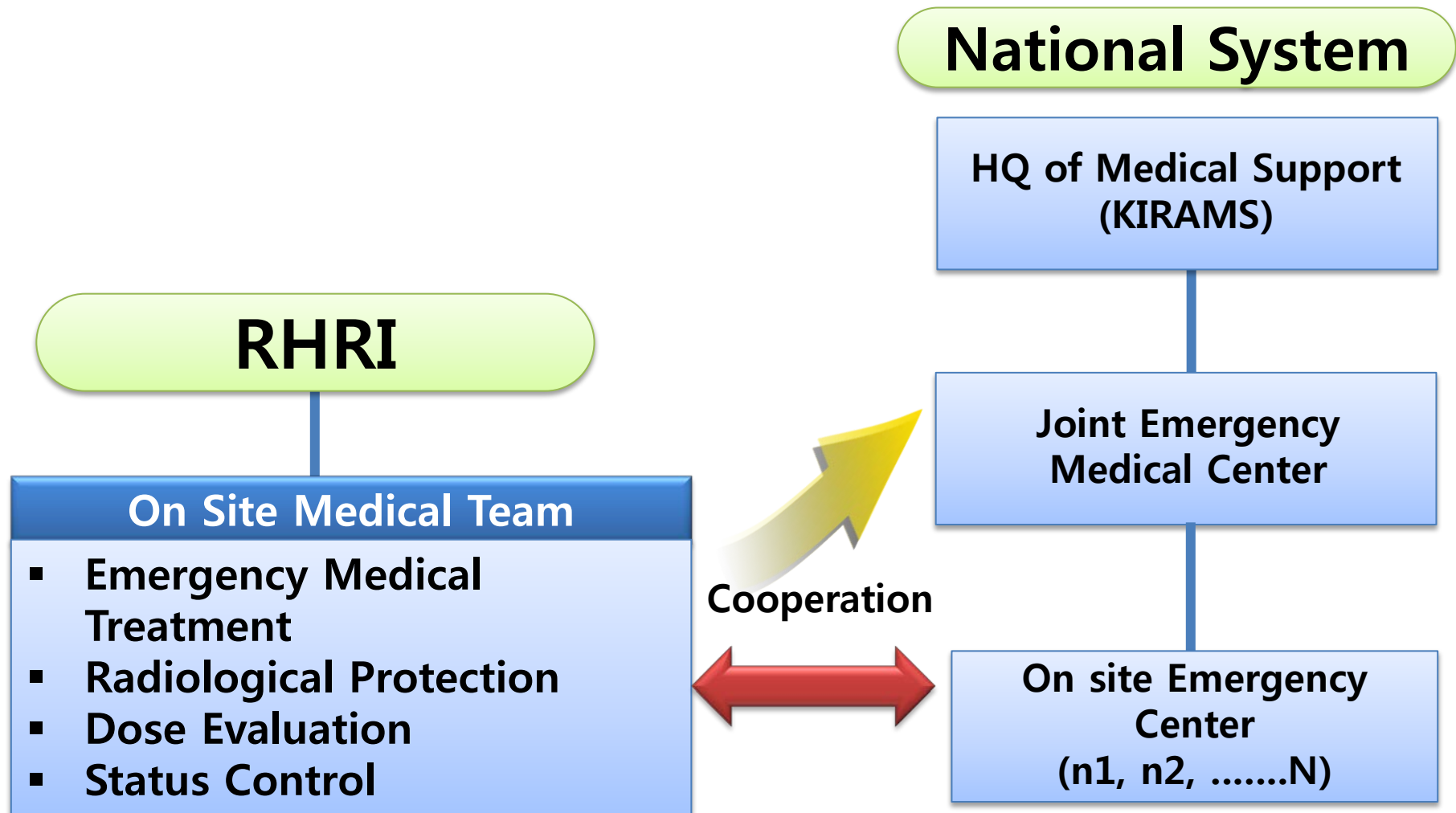
- Education/ training for radiation emergency treatment
- Applying Essential Item for treating radiation accident victim
 - Isolation rooms, Decontamination equipments & protective equipment
- Financial support for developing REMP capabilities
- Medical counseling in case of radiation accident occur

Organization of RHRI in NPP Emergency

Emergency RHRI



Organization of RHRI in NPP Emergency



Treatment flow of Radiation accident victim in NPP

First Aid



Medical Tx



Advanced Tx (esp, Internal Decorporation)



Tele-
Consultation

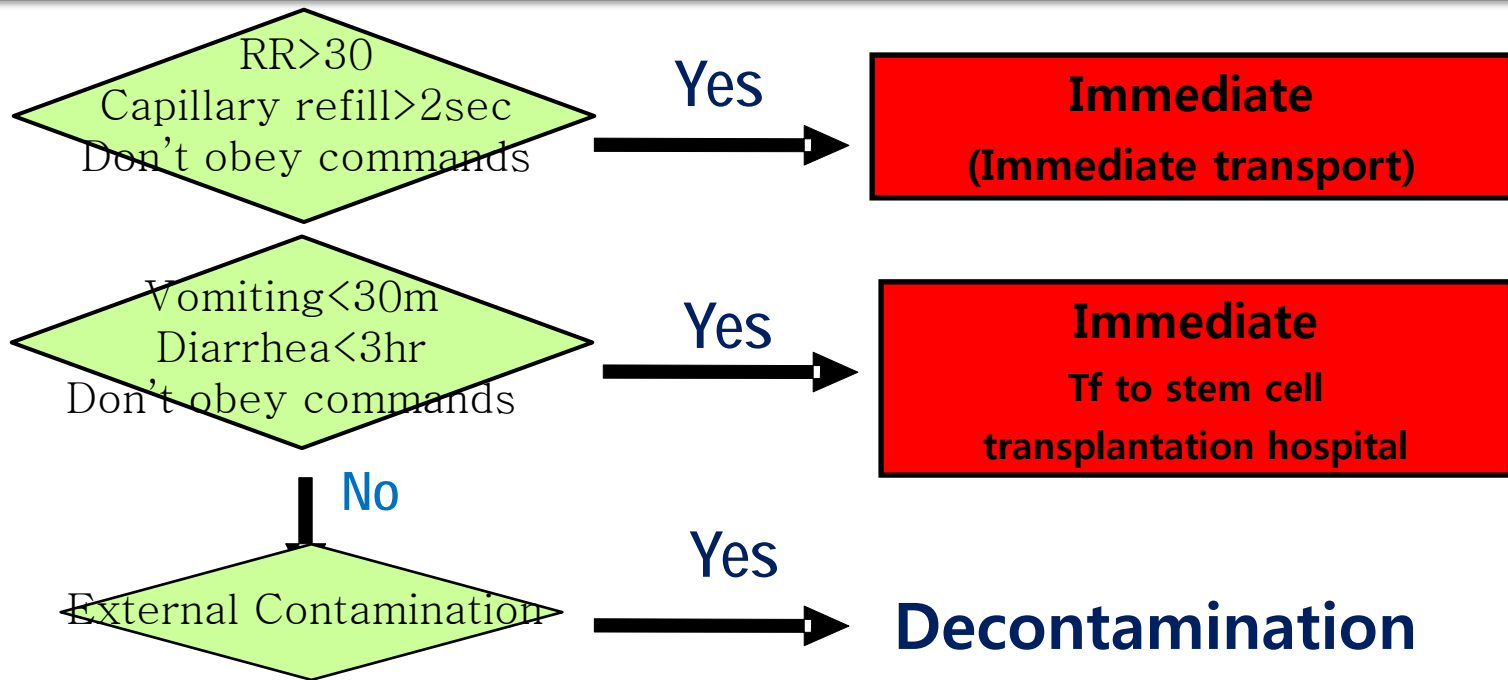
On site

Appointed
Hospital

RHRI

Isolation Room
- Air filter system
- Drainage system

TRIAGE algorithm for radiation accident victim



Delayed

Minor

Expectant

Trauma

Serious injuries

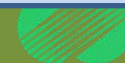
Walking wounded

Unlikely to survive

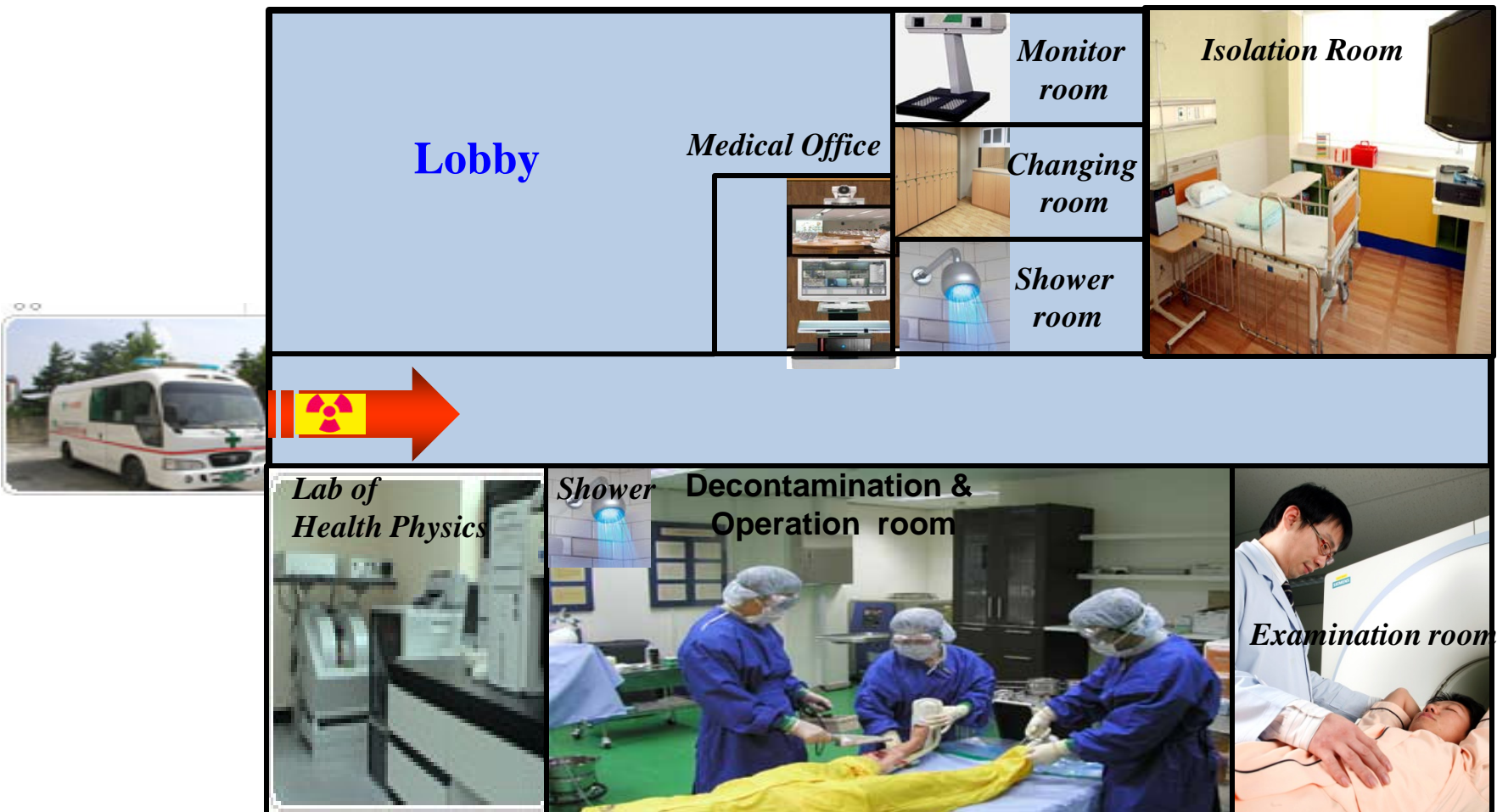
Radiological
Exposure

Stimulation therapy
- Vomiting < 1hr
- Headache

Supportive Care



Flow for Radiation accident victim in RHRI



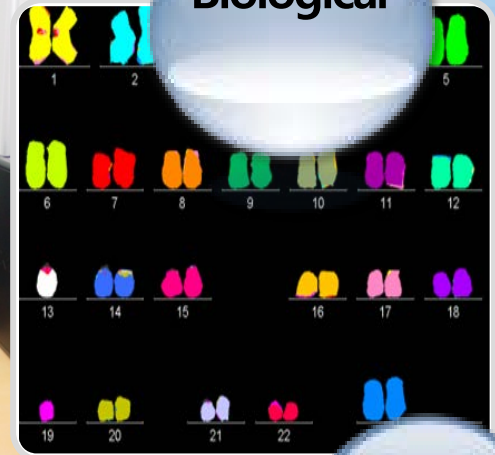
Radiation Dose Evaluation System of RHRI, KHNP

Physical



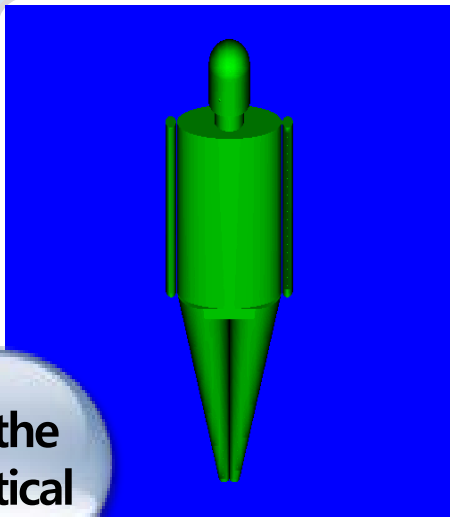
Radiation Dose
Evaluation
System

Biological

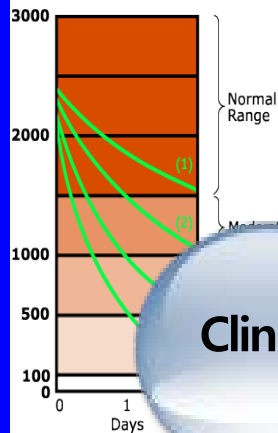


Korean
Phantom
study

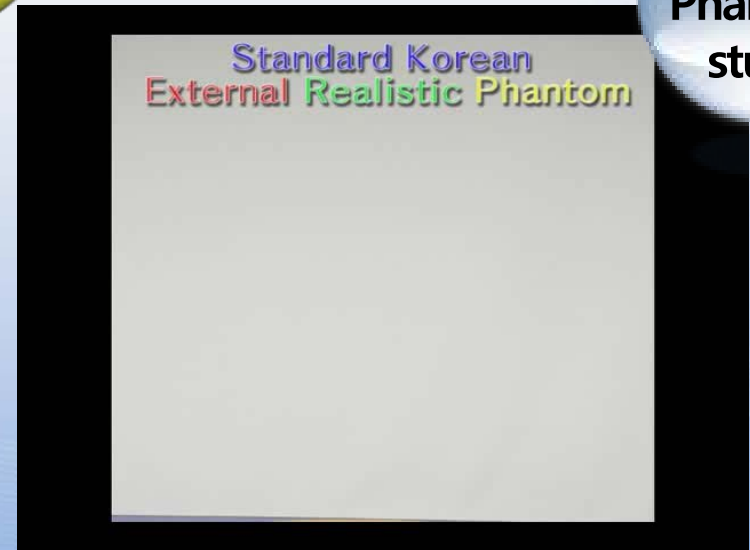
Mathe-
matical



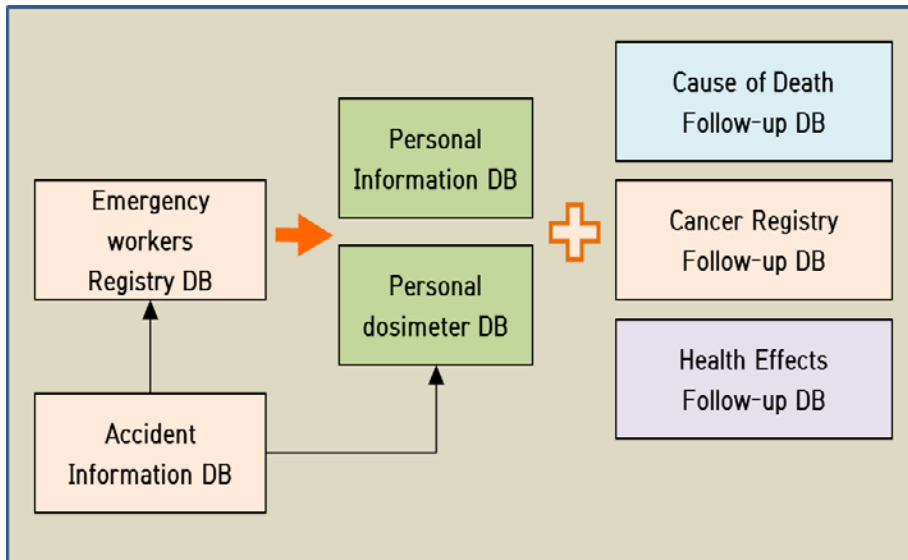
Clinical



Standard Korean
External Realistic Phantom



Health Risk Assessment in Radiation Emergency



The screenshot shows a web-based application titled 'Program for estimating lifetime risk of developing cancer after radiation exposure for Korean'. The interface includes a sidebar with navigation links: '인과확률' (Probability of Causation), '업무상질병인정기준' (Criteria for Recognition of Occupational Disease), 'RHRI-PEPC', '인과확률의계산' (Calculation of Probability of Causation), and '관련자료' (Related Materials). The main content area is divided into two sections: 'Personal Information' and 'Exposure Information'. The 'Personal Information' section includes fields for '이름 (Claimant Name)', '성별 (Gender)', '출생년도 (Birth Year)', '알진단년도 (Year of cancer Diagnosis)', '암의종류 (Cancer model)', and '흡연력 (Smoking history)'. The 'Exposure Information' section includes a field for '피폭횟수 (Number of Exposure)' and a button for '피폭정보입력 (Dose input information)'. The interface is displayed in a Microsoft Internet Explorer browser window.

Epidemiological survey for emergency workers & victims

Lifetime risk estimation based on radiation dose



Study on Health Effects of NPP workers



Comprehensive Health Evaluation

Assessment



Analysis



DB



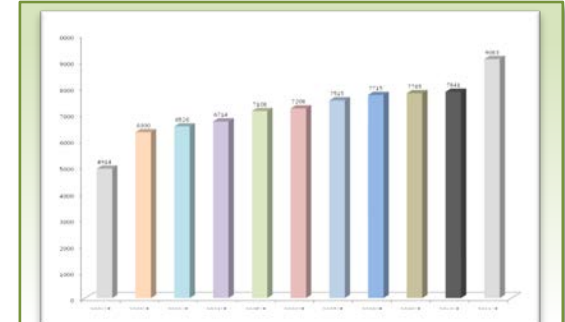
Health Examination

- Act based practice
- About 300 items



Health Surveillance

- Clinical evaluation
- High risk group selection



DB Construction

- Construction of health examination DB
- Biological Material Bank

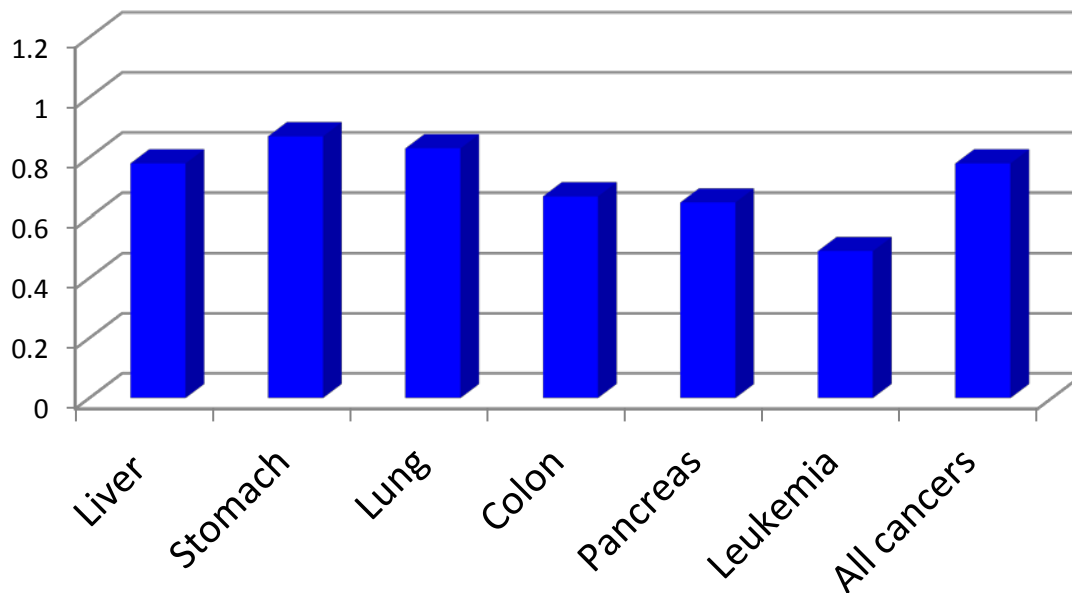
Health Management & Research on Disease Incidence



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 미달초 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-PEPC
Program for Estimating The Probability of Causation

인과확률
업무상질병인정기준
RHRI-PEPC
인과확률의 계산
관련자료
관련링크

인과확률 계산 프로그램 RHRI-PEPC는 방사선작업종사자에게서 발생한 일에 대한 인과확률(Probability of Causation)을 추정하기 위한 프로그램으로, 미국 NCI와 CDC에서 발표한 암위험률모형에 근거하여 한국인에 적합한 인과확률을 계산하도록 설계되었다. 본 프로그램은 한국수력원자력(주) 자체연구과제 수행의 일환으로 방사선보건연구원에서 개발하여 운영하고 있다.

Probability of Causation

인과확률계산 바로가기

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

KCHNP 방사선보건연구원

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[132-7031] 서울시 도봉구 쌍문동 388-1 방사선보건연구원
전화 : 02)3499-6609 팩스 : 02)3499-6666

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

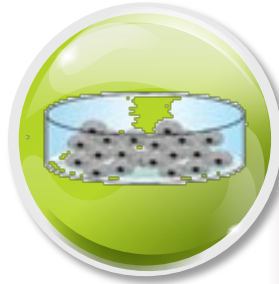


Low Dose Radiation Effect Research

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

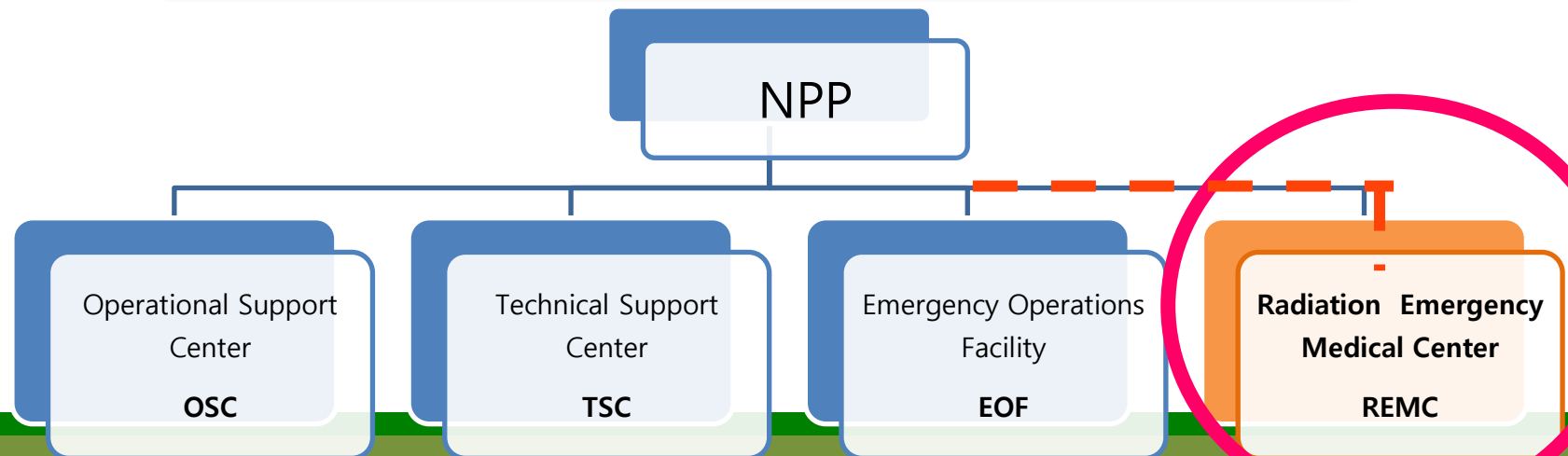


New Organization of REMP System

Radiation Emergency Medical Center at every NPP site

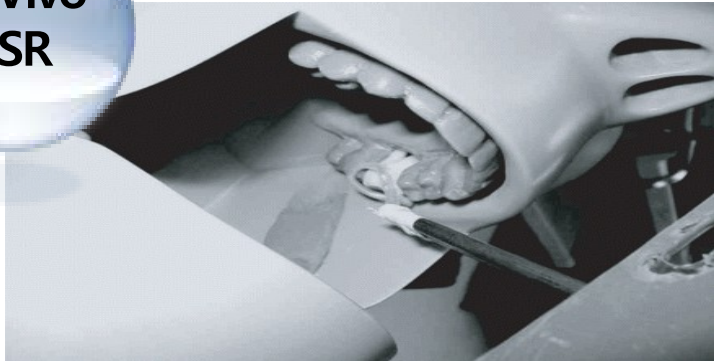
- Composed of 6 medical personnel in each NPP site.
- Normal : Perform Intensive Health Management for NPP workers
- Emergency : Perform Radiation Emergency Medical Treatment for workers

Emergency Response Facility of NPP



Radiation Dose Evaluation System for the Large Scaled Accident

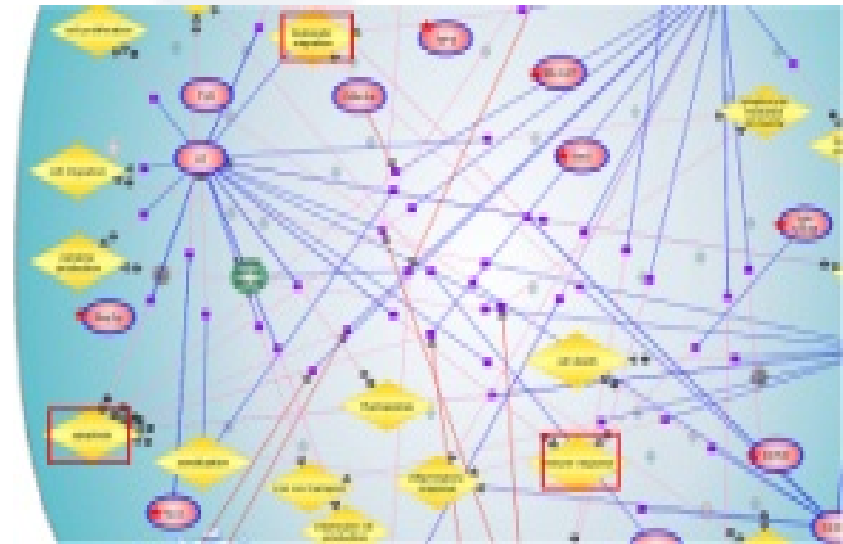
In-Vivo
ESR



Mobile
WBC



Genomic
Biodosimetry



Korea Hydro & Nuclear Power
Radiation Health Research Institute



Thank you



Korea Hydro & Nuclear Power
Radiation Health Research Institute