Implementing Increased Controls at a Major Medical Center

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WFUBMC has eight specific licenses issued by the NC Radiation Protection Section (we expect to add three new licenses in 2009...)

These licenses allow for

- Research, diagnostic & therapeutic use of isotopes
- External beam therapy
- Brachytherapy
- Manufacture of PET isotopes
Fall 2005: NCRPS administratively amends our broad scope medical and Gamma Knife licenses

This was in accordance with a directive from the USNRC to increase security for certain radioactive materials in certain quantities

- basis for this is death or permanent injury in 2-4 hours from exposure to these sources of ionizing radiation
Increased Security Requirements

Six Increased Controls (IC)

- IC1: Verify trustworthiness and reliability for individuals with access to specific radionuclides
- IC2: Program to monitor and immediately detect, assess and respond to unauthorized access
- IC3: Addresses safe handling, use and control of licensed material in transportation
Increased Security Requirements

- **IC4**: Addresses safe handling, use and control of licensed material in use and storage of mobile or portable devices
- **IC5**: Licensee retains documentation required by increased controls for 3 years after no longer effective
- **IC6**: Control of detailed information generated by licensee from unauthorized disclosure
<table>
<thead>
<tr>
<th>Isotope</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>$^{241}$Am</td>
<td>16 Ci</td>
</tr>
<tr>
<td>$^{252}$Cf</td>
<td>5.4 Ci</td>
</tr>
<tr>
<td>$^{60}$Co</td>
<td>8.1 Ci</td>
</tr>
<tr>
<td>$^{153}$Gd</td>
<td>270 Ci</td>
</tr>
<tr>
<td>$^{147}$Pm</td>
<td>11,000 Ci</td>
</tr>
<tr>
<td>$^{239}$Pu/Be</td>
<td>16 Ci</td>
</tr>
<tr>
<td>$^{90}$Sr($^{90}$Y)</td>
<td>270 Ci</td>
</tr>
<tr>
<td>$^{169}$Yb</td>
<td>81 Ci</td>
</tr>
<tr>
<td>$^{241}$Am/Be</td>
<td>16 Ci</td>
</tr>
<tr>
<td>$^{244}$Cm</td>
<td>14 Ci</td>
</tr>
<tr>
<td>$^{137}$Cs</td>
<td>27 Ci</td>
</tr>
<tr>
<td>$^{192}$Ir</td>
<td>22 Ci</td>
</tr>
<tr>
<td>$^{238}$Pu</td>
<td>16 Ci</td>
</tr>
<tr>
<td>$^{75}$Se</td>
<td>54 Ci</td>
</tr>
<tr>
<td>$^{170}$Tm</td>
<td>5,400 Ci</td>
</tr>
</tbody>
</table>
Initial Changes

- E-mail to request irradiator training (written record) vs. phone call
- Completed & signed application to use research irradiators
- Cc Human Resources for background info for employees/Admissions Office for grad students (no summer students, part-time or temp, visiting research personnel are eligible)
Initial Changes

- Confidential statement on all written records (e-mails, blueprints, drawings, letters, etc.)
- Install cameras, badge readers in research areas
- Maintain records under lock & key
- Monthly printout of badge access from Card Access Security Manager
IC Inspections

- September 2006: 1st inspection
- November 2007: 2nd inspection
- These are separate from the regular "health & safety" state inspections; emphasis is on security
- Best to get security, upper-level administration and anyone else you deem necessary involved in the process
December 2007

- Thanks to Bob Emery, I attended a two-day NNSA Safety & Security Conference in Houston, Texas
- Made contacts for assessment of our isotopes of concern at WFUBMC
January 2008

- At our invitation, four DOE NNSA engineers visit WFUBMC for a vulnerability assessment in a non-regulatory capacity
- NNSA final report with recommendations on improving security and reducing vulnerability sent to RSO in March;
March 2008

- NCRPS administratively amends our licenses to require fingerprinting for individuals with unescorted access to the Gamma Knife and four irradiators.
WFUBMC Security is authorized to perform fingerprinting (MDs); FCSO to digitally do them if needed

EH&S is currently funding all fingerprinting (WFUHS, NCBH & Budd Security)

Conference with Dean’s Office on background checks for foreigners and how to handle results showing a previous arrest of PI, MD, etc.

Checklist to follow the whole vetting process with dates
Training

- Normally scheduled annual in-service training in Radiation Oncology (licensing, regulations, approval of new physicians as AUs, etc.)
- In 2008 I focused solely on IC issues in Radiation Oncology so hopefully there would be no surprises (fingerprinting, badge access, installation of more security equipment, etc.)
October 2008

- 10 GTRI personnel re-visit WFUBMC to assess our security improvements & offer more services
- Contracts signed between Sandia National Laboratory/WFUHS/NCBH/Johnson Controls to purchase and install more equipment, servers, provide training, etc.
- Also made a contact through Off-Site Source Recovery Project to dispose of unwanted $^{60}\text{Co}$, $^{137}\text{Cs}$, $^{226}\text{Ra}$ & $^{241}\text{Am}$ sources
“Semper Gumby”

- Be patient and flexible
- You are one of many licensees that the feds may be working with
- Stay in contact with them
- Cc others at your institution who may be involved (contracts & purchasing, security, committee chairs)
How Radiation REALLY Works...

"I think you should be more explicit here in step two."
The “Black Box”
What’s at Stake?

- These radioactive sources all have a beneficial use to society but can be used in a nefarious manner (sabotage or theft → RED, contaminant, RDD)

- Potential millions (billions?) of $$$ in cleanup, decontamination, medical care to those affected (Gôiania 1987)

18g of CsCl

3,500 m$^3$ of waste
What’s at Stake?

- Loss of reputation (Moses Cone 1998); media most likely will be notified.
- IF a terror event occurs, authorities can trace the source material to a specific licensee → investigation → big time trouble for someone...
Culture Change

- Every place is different
- An engineering firm with 2-3 IR cameras is going to have a different attitude towards security than a college campus or hospital with hundreds or thousands of people
Security personnel are used to seeing crimes committed on camera or called in, apprehending the perpetrator and turning them over to the police.

Our situation involves potential terrorism vs. everyday crime.
“Need to Know”

HIPAA

LOOSE LIPS

Sink Ships
Public Information Officer

Maybe how you see him...
Public Information Officer

How you want to see him...
Procedural Changes

- Not wanting to label everyone “suspect” but must assess who has access and why to these isotopes
- Gamma Knife: only certain physicists, nurses & stereotactic coordinators
- Have GK patients change into scrubs vs. street clothes
- Not allow family members to accompany GK patients into the room prior to treatment
What’s Important to Clinical & Research Personnel?

MD: What’s wrong with my patient and what can I do to make them better?

PhD: MY research in MY lab in MY department...getting MY grant renewed...getting MY paper published...tenure
What’s Important to Clinical & Research Personnel?

These increased controls may/may not be a blip on their radar screen; “the RSO takes care of these regulatory things”
The RSO...

How they see you...

How they make you feel...
WFUBMC “Chain of Command”

CEO: EVERYTHING - $$$; reputation; JCAHO; competition

Dean of Medical School: provide leadership in medical education, scholarly activity and care of patients

Office of Research: Facilitate funding and education for basic and clinical research activities

EH&S Director: Chemical/Radiation/Biological safety; budget; supporting Office of Research

RSO: Ionizing radiation
Training

- Do training for security staff, upper administration, etc. who most likely are not familiar with radiation, regulations, hazards, ICs, etc.

- Also consider contacting local law enforcement (city/county) & SWAT teams to tour your facility to familiarize them with what you have, where it is, what it does and what it is capable of
What Every Public Safety Officer Should Know About Radiation and Radioactive Materials

http://www.jus.state.nc.us/NCJA/radbro.pdf
The Future?

- More isotopes may be added to list (e.g., $^{131}\text{I}$ for thyroid treatment)
- Activity limits may be lowered (e.g., $^{192}\text{Ir}$ in HDR brachytherapy unit)
- Terrorist threat continues to be studied and evaluated in the United States and around the world
Radionuclide Theft and Diversions: 1992 - 2003
Incidents and Suspected Smuggling Routes

Legend
- Green circle: Origin
- Red circle: Interdiction
- Blue circle: Destination
- Purple circle: Waypoint
- Blue lines: Suspected Smuggling Routes

Produced by Argonne National Laboratory; 2 December 2003
The Future?

- A terrorist event may illustrate things we didn’t anticipate.
- We must undertake all *reasonable* efforts to secure our radioactive materials of concern.
- “World at Risk” report was released in December 2008; e-mail me if you want a .pdf version to read.
- Andrew Karam’s paper on “Radiological Terrorism.”
The ICs...

How they make us feel...

How we want to feel...
“Where is this in writing?!?”

- May be a little late now since we are past all deadlines for implementation but if anyone (especially in upper administration) questions any part of the increased security orders, send them this: Federal Register / Vol. 72, No. 239 / Thursday, December 13, 2007 / Notices 70901

Remember...

Grant IS coming...

- Records review
- Interview with critical personnel
- Assessment of equipment implementation
In closing...

- Every licensee is different, what works at one place may not at another...
- May be competing interests ($, politics, business, turf wars, bad attitudes, ignorance, resistance, impedance) that may be beyond your control
- Agencies exist to help with expertise & a fat checkbook (NNSA)
- No one has all the answers so we help each other out (thanks to all the RS people I’ve called...)
"It is easy to prevail over those who have not thought ahead."
“Wisdom consists of the anticipation of consequences.” Saturday Review, April 15, 1978
Our Goal...
Any Questions?
Fin

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