“Best Practice” Cancer Care

16 November 2005

Cancer Care - Current Trends

i. Responding to market driven needs

Develop a new facility to expand the patient base

Integrate comprehensive cancer program

Integrate new high technology in care treatment

Deliver advanced clinical services

Telemedicine

Create a fresh vision of healthcare environment for patients / provide environment

to recruit and retain talent in cancer treatment and research

Cancer Care - Current Trends

ii. Patient Centered Design

‘One stop’ centres

Multi-disciplinary team approach

Service-oriented care centres designed to treat specific types of cancer

Specialized care centre for Paediatrics

Specialized care centre for Women

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iii. Emerging Treatments

Three Dimensional Conformal Radiation Therapy

Intensive-Modulated Radiation Therapy (IMRT)

Hyperthermia

Radio- immunotherapy

Genetics

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iv. Radiation Oncology/Radiotherapy

Accommodate “hot” patients due to radioactive implants

More stringent shielding requirements

Accommodate “image guidance” systems in LINACs

Accommodate emerging MRI Simulation

Continued development of “hybrid” imaging modalities

Greater collaboration: radiologists and radiation oncologists

Portable radiation therapy devices

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v. Medical Oncology/Chemotherapy

External/internal views and natural light from infusion areas

Provision of varied treatment settings (private and small groups)

Provide positive distractions (i.e. music, art)

Avoid sources of micro-bacteria/infection (patients have compromised immune systems)

Adjacency of pharmacy

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vi. Surgical Oncology

ORs (operating rooms - theatres) to accommodate 3D images

Increasing use of image guidance in the OR

Emergence of portable radiation therapy in the OR

Direct access (vertical or horizontal) from diagnostic oncology to surgical Procedure rooms

Brachytherapy (shielded room)

Comprehensive Cancer Centers integrating Surgical Oncology, Radiation Oncology, and Medical Oncology

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vii. Patient Focused Design

Provide for effects of psycho-neuroimmunology by non-institutional design

Providing convenience and improving patient-staff interaction

Natural light

Wayfinding landmarks

Access to nature

Hierarchy of spaces / rational sequence / separation of circulation

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viii. Improved Amenities

Call-in advice centre

Library / resource room

Instructional kitchenette

Meditation room

Juice bar / café

Contemplative garden / nature

Spa / beauty salon

Wig / accessories shop

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viiii. Research

From treatment to prevention

Genetic modification / gene therapy

Stem cell treatment

Laboratories for clinical / genetic testing

Computerization that enhances the finite details of tumor elimination

Minimally invasive treatment

Holistic and comprehensive planning

Collaboration and cooperation with regulatory agencies

Faculty network - broad based – international

Cancer Care – Principal Differences: US / UK

Market driven U.S. healthcare provides profit motive for development of latest protocols and methods

Hospital's survival in US is dependent in part on its positioning & competitive edge

Competition amongst hospitals has resulted in continuous investment in modernization (facilities and technology) to keep up with consumer demands and to spur market share growth

Patient centred approach

Institutions such as National Cancer Institute (NCI) promote prevention / research / new technology

“Best Practice” - Cancer Care

II. Current Technology

Cancer Care Treatment - Overview

- **Radiation Therapy**
  - External Beam Radiation
  - Brachytherapy
  - Intensity Modulated Radiation Therapy (IMRT)
  - Tomotherapy
- **Surgical Oncology**
  - Traditional Surgical Treatment and Diagnosis
  - Portable Intra-operative Radiation Therapy (IORT)
- **Chemotherapy**
- **Targeted Therapies**
- **Oncology Imaging**

❑ Radiation Therapy

External Beam Radiation is the delivery of high-energy radiation (I.e., electrons, x-rays, photons) to kill cancer cells.

Brachytherapy is radiation delivered inside the body by implanting small radioactive seeds into a tumor or body cavity.

Intensity Modulated Radiation Therapy (IMRT)

Traditional External Beam Radiation utilizes a constant beam intensity, and can damage healthy tissue as well as malignant cells, if not precisely focused.

IMRT is a relatively new technique revolutionizing radiation therapy.

IMRT produces multiple treatment fields, with varying beam intensity.

Radiation beams are configured to optimize dose delivery to the tumor while minimizing the dose delivered to surrounding areas.

Tomotherapy utilizes CT-Based image guidance to enhance IMRT delivery.

Image guidance overcomes the time-consuming challenge of accurately placing a patient in the exact position needed for accurate radiation.

Image guidance compensates for organ motion, which complicates coordination of pre-treatment images and treatment planning.

IMRT is delivered as a 360° spiral helix using a Linac mounted on a conventional CT slip ring.

Tomotherapy

Advantages:

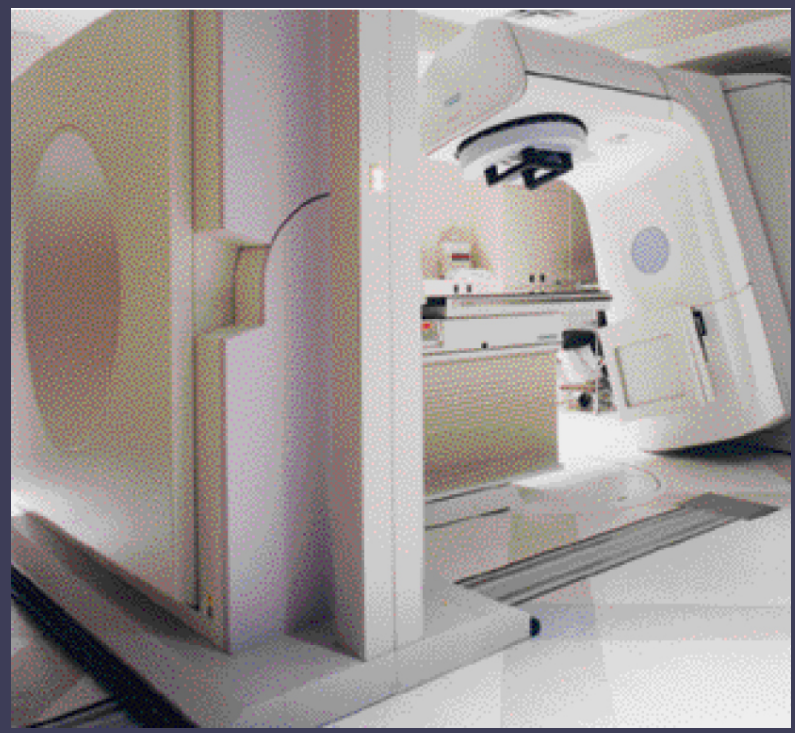
•Higher treatment volumes than conventional radiation therapy.

•More precise delivery of radiation beam.

•Better treatment planning efficiency.

•Easier treatment delivery and less patient set-up time for radiation therapist.

•Shorter treatment duration.



Limitations:

•New technology; some components still under development.

SPECT-CT

•Only technology to completely integrate the functional sensitivity of SPECT with the rich anatomical detail of diagnostic multislice-CT.

•Offers superb image quality for precise lesion localization.

•Enables physicians to detect changes in molecular activity even before anatomical changes become visible.

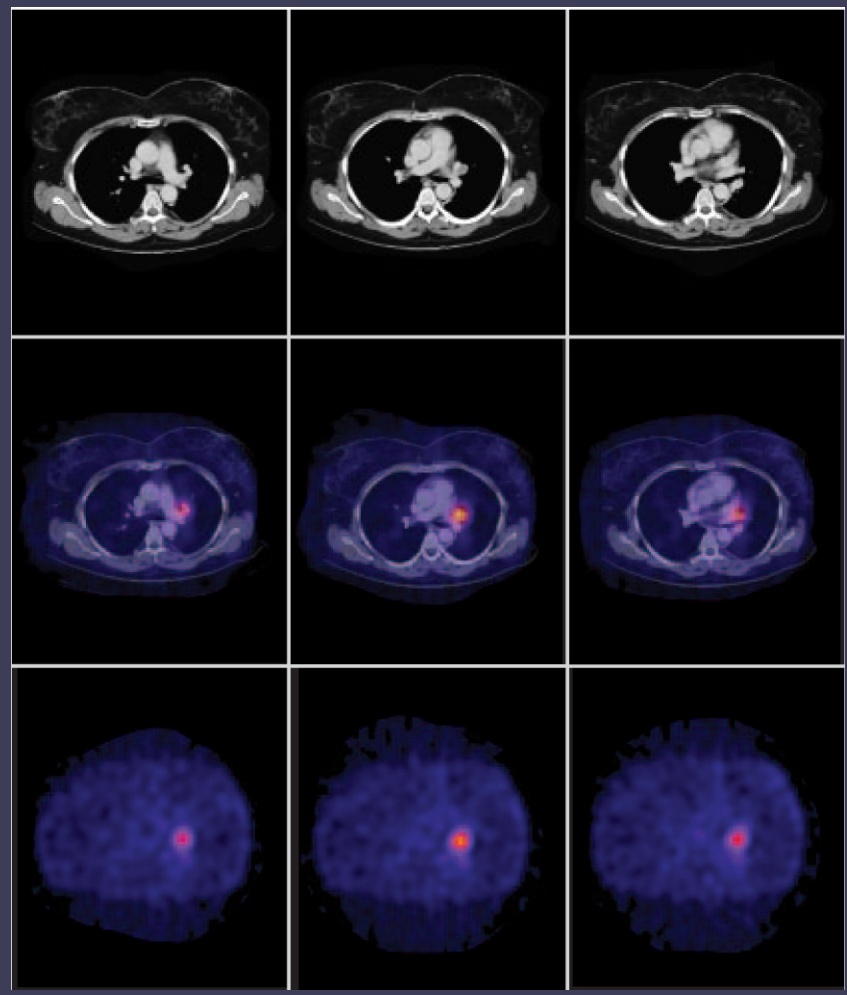
•Goes further to reveal primary tumors, detect metastases, quantify uptake and reduce false positives.

SPECT-CT

•Diagnostic multi slice-CT allows precise organ and lesion localization, providing full diagnostic quality CT in less than 30 seconds.

•The functional and anatomical clarity that's possible with SPECT-CT technology has the potential to revolutionize treatment planning for cancer.

•Simultaneously captures diagnostic information from both studies: quickly, accurately and without patient re-postioning.



SPECT-CT

•With earlier and more accurate diagnoses, physicians can plan treatment more effectively, provide feedback on treatment efficacy, avoid unnecessary invasive surgery, and improve overall care and prognosis for patients.

•Provides more precise localization of abnormalities, so the risk of surgical procedures is reduced.

•Scans are completed using the lowest possible radiation dose.