New UCSF Children's Hospital
Lessons Learned

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Section Chief, Pediatric Radiology
Disclosure

Research grant from General Electric Healthcare
Pediatric PET MRI

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Outline

• History
• New Radiology Department
• Challenges / lessons learned
UCSF Mission Bay Hospitals

Integrated Children’s, Women’s Specialty and Cancer Hospitals

- **Children's Hospital** – 183 beds
  - urgent/emergency care and pediatric primary and specialty outpatient care

- **Women's Specialty Hospital** – 36 beds
  - cancer care, specialty surgery, a 36-bed birth center and select women's ambulatory services

- **Cancer Hospital** – 70 beds
  - first step to full cancer services at MB

- **Outpatient Building and Helipad**
Mission Bay – *Illuminating the blind men and an elephant*

One's subjective experience can be true, but that such experience is inherently limited by its failure to account for other truths or a totality of truth.
Mission Bay – *Illuminating the blind men and an elephant*

1. History

2. The Players

3. Funding

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1. History

- Ohlone Indians
- 1775 Spanish set up Mission Dolores
Mission Bay – *Illuminating the blind men and an elephant*

1. History

1849

1850s Gold Rush -

Shipbuilding
Mission Bay – **Illuminating the blind men and an elephant**

1. History

1980

- Landfill - debris from 1906 earthquake
- Industrial zone

*Implications for construction*
Mission Bay – *Illuminating the blind men and an elephant*

1. History

Olive View Hospital
Sylmar Earthquake, San Fernando, CA

1973 Seismic Safety Act
Sylmar 1971
Northridge 1994

Extensions
2008 -> 2013
-> 2020
Parnassus Campus

1. History

More expensive to retrofit

Zoning restrictions
Mission Bay – *Illuminating the blind men and an elephant*

2. The players

Growth of tax base

Shift from industry to healthcare & housing

City of SF

Private business

UC System
2. The players

MLB Giants
NBA Warriors
Residential
Commercial

City of SF
Private business
UC System
Mission Bay – *Illuminating the blind men and an elephant*

2. The players

City of SF
Private business
UC System
Mission Bay — *Illuminating the blind men and an elephant*

3. Understand UCSF

**Academic**

- $4 B annual operating budget
- UC System
- Medical & nursing school, graduate programs
- Top NIH funding 555 M/yr (Radiology ~40 M/yr)

**Medical Center**

- 600 Beds (~420 adult, 180 pediatric)
- 3 campuses with $2 B annual net revenue
- Close ties with VA & SF General Hospital

$4 B annual operating budget
Mission Bay – *Illuminating the blind men and an elephant*

4. Funding

$1.5 Billion total cost
- 280 bed hospital
- Outpatient building
- Parking garage
- Energy center

$100 Million - Benioff
Mission Bay — *Illuminating the blind men and an elephant*

4. Funding

<table>
<thead>
<tr>
<th>Total Cost</th>
<th>Equipment Cost</th>
<th>Radiology Budget</th>
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<tbody>
<tr>
<td>$1.5 Billion</td>
<td>$223M</td>
<td>~20% under budget</td>
</tr>
<tr>
<td>($23M Radiology equip.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Funding

Radiology ~20% under budget

Lessons: A large system has leverage

Help: consultants (RTKL), UC purchasing, Bob Gould

Price likely tied to other purchases:

Patient monitoring
Energy system
Etc.

Radiology got what we wanted.
Mission Bay – *Illuminating the blind men and an elephant*

4. Funding

Radiology ~20% under budget

Lesson: **Cost centers change after opening.**

After opening:
New processes to follow
New people to work with

*Radiology will never see these savings back!*
Mission Bay Campus

Institutes
Orthopedic
Cardiovascular
Cancer
Global Health
Neuroscience

Biomedical Research
Gladstone
Genentech Hall
Byers Hall

Student Housing
Recreation Center
How does Radiology fit into this?

- Institutes
  - Orthopedic
  - Cardiovascular
  - Cancer
  - Global Health
  - Neuroscience

- Biomedical Research
  - Gladstone
  - Genentech Hall
  - Byers Hall

- Student Housing
- Recreation Center
UCSF Radiology at Mission Bay

- China Basin
  - Outpatient CT/MR/PET
  - Research - Cyclotron, PETMRI

- Orthopedic Imaging
  - Outpatient x-ray/MR

- QB3 - Research

- Ambulatory care
  - Pediatric US/x-ray

- Main Hospital
Radiology

1st Floor

- 3 MR Units
- 3 CT Scanners
- 4 Ultrasound Rooms
- 1 PET/CT
- 2 Fluoroscopy, 1 x-ray
Radiology
1st Floor

Adult Entrance

Pediatric Entrance

Patient waiting areas undersized
Not much shelved space in the hospital.
Radiology
1st Floor

Repurpose space
Gift shop
Offices:
  Hospital admin
  Radiology admin
  Call room

Pediatric ER
Radiology

2nd Floor

- 2 angio suites
  - Body IR
  - Hybrid
    - Neuro IR
    - ERCP
    - Peds Cardiac

- Intra-op MRI
- Behind redline
- Integration with PACU
Radiology

2nd Floor

• Behind redline

Problem for outpt IR

Adult ORs

1 Angio
1 Hybrid
MRI + OR

Pediatric ORs

Flex ORs
Radiology

2nd Floor

- Hybrid room

Shared w GI & Cardiac Surg

Setup as a neuro biplane

Radiology controls scheduling

Block time lost if not used
## Radiology Expertise at Mission Bay

### Children's Hospital

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Physical presence</th>
<th>Number of staff on during day</th>
<th>Attending</th>
<th>Resident</th>
<th>Fellow</th>
<th>Interdisciplinary conferences @ MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pediatric Radiology</td>
<td>Yes</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Neuroradiology*</td>
<td>Yes</td>
<td>5-6</td>
<td>1-2</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Nuclear Medicine*</td>
<td>Yes</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td>1</td>
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<tr>
<td>Cardiac &amp; Pulmonary*</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Interventional Radiology*</td>
<td>Yes</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>Neurointerventional</td>
<td>Yes</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
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</table>

### Women's & Adult Cancer

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Physical presence</th>
<th>Number of staff on during day</th>
<th>Attending</th>
<th>Resident</th>
<th>Fellow</th>
<th>Interdisciplinary conferences @ MB</th>
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</thead>
<tbody>
<tr>
<td>Adult abdominal Imaging</td>
<td>Yes</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Adult ultrasound</td>
<td>Yes</td>
<td>2-3</td>
<td>1</td>
<td></td>
<td>0-1</td>
<td>2</td>
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<tr>
<td>Adult musculoskeletal</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast Imaging</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

* Pediatric and adult
Shared Reading room

Neuro  AI  Peds  Nucs

US, IR
How did we plan for this?

Radiology Committees
- Equipment purchase
- Operations

Consensus

Medical Center Project team
- MC leadership
- Contractor
- Consultants

Other Departments

Professional & technical teams
Radiology

Planning committee

- Ron Arenson
- Jim Barkovich
- Spencer Behr
- Soonmee Cha
- Bill Dillon
- Cathy Garzio
- Orit Glenn
- Ruth Goldstein

- Robert Gould
- Steven Hetts
- Robert Kerlan
- Kathy Knoerl
- John MacKenzie
- Miguel Pampaloni
- Jane Wang
- Ron Zagoria
Radiology

Planning committee

- Ron Arenson
- Jim Barkovich
- Spencer Behr
- Soonmee Cha
- Bill Dillon
- Cathy Garzio
- Orit Glenn
- Ruth Goldstein

- Robert Gould - Equipment
- Steven Hetts
- Robert Kerlan
- Kathy Knoerl - Staff
- John MacKenzie - Professional
- Miguel Pampaloni
- Jane Wang
- Ron Zagoria
What we planned

Operations
Take what we are doing well
Improve on it and try some new things

Equipment
Get the latest and greatest
(given the time and space constraints)
Distribution of pediatric examinations performed at Moffitt in October 2010

Percentage of pediatric examinations = no. peds / no. adult studies performed by each technologist
Challenge - Pediatric focused staff

Adults / Peds imaging examinations

2010: 85% vs. 15%

1 of 30 Radiology nurses peds focused

Radiology techs rarely help a kid

Day care analogy
Challenge - Pediatric focused staff

Adults / Peds imaging examinations

2010: 85% vs. 15%

1 of 30 Radiology nurses peds focused

Radiology techs rarely help a kid

2015: 50% vs. 50%

6 of 6 Radiology nurses are peds who help adults

50% of tech work is pediatric

Techs stay at Mission Bay
Some rotate to Ortho Institute
Change – Focused imaging scheduling

MRI locations for pediatric patients

2010
China Basin
Mount Zion
UCIC
Moffitt Long 3rd floor North
Langley Porter
Orthopedic Institute

2015
Mission Bay
China Basin
Orthopedic Institute

Kids come first in new hospital
Change – Child Life Services

Department Chair: What is child life services?
Change – Child Life Services

Started as per diem

Now 1 FTE & plans to increase

Everyone sees value, but hard to quantify
Patient Experience

MRI -> Cable Car
MRI -> Marina / Bay
SPECT/CT -> Muir Woods
Patient Experience

Target audience

- Child focused
- Teen acceptable
- Adult enjoyable
Challenges

Great PR!

Who pays for this?

14 K per year service
Challenge - How to maintain and grow themes?

vs. haphazard extension of patient experience
Challenge - Revitalizing pediatric section

Next generation of pediatric radiologists

Nearing retirement or Called back from retirement

2010  2015
Challenge - Revitalizing pediatric section

Claiming pediatric imaging from adult sections

2010

Covered by peds section
- Inpt radiographs
- Fluoro
- Body CT/MRI

Not covered by peds section
- Outpt radiographs
- Ultrasound, MSK
- Nucs, Neuro, IR

2015

Inpt/outpt radiographs
- Fluoro
- Body CT/MRI
- Ultrasound
- MSK (50%)
- Body & MSK biopsies

50% MSK
- Nucs, Neuro, IR
Challenge - Revitalizing pediatric section

Claiming pediatric imaging from adult sections

**Re-slicing the pie**

**Growing the pie**

+300% MRI growth

20% US growth
Challenge - Revitalizing pediatric section

Claiming pediatric imaging from adult sections

RVU growth of Pediatric Imaging Section
How we opened

- Opened outpatient clinics a week early
  - Radiography and outpatient MRI

- Tested out reading rooms via teleradiology

- After opening: Ramped up outpatient volume over several weeks
How we opened

- Radiology did remarkably well

- (unlike other areas)

- Likely due to our experience already at other sites
How we moved
How we moved

- Moved all patients in one day
  - Super Bowel Sunday
- Drew down census prior to move
- Early AM portable run and readout prior to move
- Staffed Radiologist in house for extended hours
Challenges
Challenges

We hope and plan for growth

Currently, MB is a shift in volume.

6 Radiology sections now cover another site

<table>
<thead>
<tr>
<th>Neuro</th>
<th>Nuclear medicine</th>
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<tbody>
<tr>
<td>Abdominal imaging</td>
<td>IR</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>Neuro IR</td>
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</tbody>
</table>
Challenges

We hope and plan for growth

Currently, MB is a shift in volume.

6 Radiology residents now cover another site

+ more call!
Challenges

We hope and plan for growth

Currently, MB is a shift in volume.

We have a dedicated radiology resident afterhours
Challenges - Working with two MRI vendors

Pros

- Diversify
- Pt experience
- Keeps vendors alert

Cons

- Newbie: learning curve, adoption
- Twice the work: not all work on both
Challenges- All 3T MRI

Affects ~1-2 cases per month

Implants

Iron quant

Other sites have 1.5 MRI for old kids

Upside is better imaging for vast majority
Challenges - Keeping current

Equipment choice 2 years before opening

Evergreen clause vs. Fixed amount for upgrades
Challenges - Request for 24/7 CT & MRI

Had this coverage in old 600 bed hospital

Do not have volume to justify, but

- ER, neurology complaining

- Problem when a CT/MRI/US is ordered but not performed because day and overnight processes are different.

- Medical Center is supporting with $$

Solution: dual CT/MRI overnight tech
Challenges

Future Congestion

Warriors’ proposed arena could clog downtown S.F

San Francisco Chronicle – July 26,
Challenges:

Saturated market

Lucile Packard Children’s Hospital Opens Dec. 2016

Peninsula limits growth

SF pop. 800-900K
Expensive for families
Challenges – Prostate MRI

Accommodating adults in a pediatric environment

Techs: but I took this job for the kids

Inpatient kids get inline behind outpatient adults

Pediatric radiologist looks like an obstructionist

Endorectal coil
Challenges – Prostate MRI

But.....maybe there is a bright side

Techs: but I took this job for the kids

Inpatient kids get inline behind outpatient adults

Pediatric radiologist looks like an obstructionist
Challenges – Prostate MRI

But.....maybe there is a bright side

More resources to share with kids

Expanded hours and staff
Challenges

Double digit growth is projected for Adults

Shapes major decisions
(so kids still lower on totem pole)
Radiology

*Motto*

- Kids come first
- Plenty of other options for adults in our system
- Plenty of room at Mission Bay for adults
The big picture

Pros

- Benefits of large adult center & biomedical research complex.
  - top-of-the-line equipment
  - resources & experts
- Research is inspiring
- Bay Area Living

Cons

- How to grow?
  - Partnership with Oakland?
  - Expand into adult towers?
- Cost of living
- Low salaries
- Small # faculty focused on pediatric imaging
Future for UCSF is at Mission Bay
Wild ride

Implications for pediatric imaging at UCSF

Change agent
- Culture more focused on kids
  - Dedicated techs/nurses for kids
  - Child Life Services
  - Revitalized pediatric imaging section

Seat at the table
- Oversee all MB operations
- Operations planning committee
- Advocate for imaging care of kids
Thank you

Wild ride

SCORCH
- Visits to pediatric hospitals
  Mott (Peter Strouse)
  Lurie (Jim Donaldson)
  Oakland (Ron Cohen)
  LPCH (Rich Barth)
  CHOP (Diego Jaramillo)

- List Serve