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Operationalizing the Integration Roadmap: A Case Study in Dosimetry Harmonization

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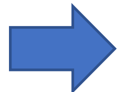

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Disclosure Slide

DISCLOSURE

I, Jennifer Willyard, have no commercial relationships to disclose.

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Goals For This Session

- Introduction to Standard Work as a Key to System Integration
- Discuss the Iterative Nature of Standardization
- Example Tools and Techniques from a Dosimetry Case Study

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“Without standards, there can be no improvement.”

-Taiichi Ohno

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Standard Work and System Integration

- One of the biggest challenges when combining teams is that teams do things “their way”
- True not just of system integration but teams large and small!
- Standard Work is a key tool to bring alignment and clear expectations to teams and staff during onboarding and as part of daily operations

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Standard Work and System Integration

- Big Feelings about “our way”
- Big Feelings about “their way”
- Two options:
    - “This is the way”
    - “Let’s build OUR way”

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Standard Work and System Integration

THE Way

Pros:

- Quick(er)
- Least variability

Cons:

- One size fits all
- May cause resentment

OUR Way

Pros:

- Enhanced engagement
- Recognize uniqueness

Cons:

- Can be slow-going
- Most facilitation needs

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Standard Work and System Integration

- There are opportunities for standard work all around us
- Real-world example of how Dartmouth Cancer Center built a single pool of dosimetry to support four locations using the “OUR Way” method
- Additional discussion of formal organizational steps to enact the standard work

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Case Study:

Dosimetry Harmonization

Operationalizing the Integration Roadmap:
A Case Study in Dosimetry Harmonization

Case Study: Background

- NCI-Designated Comprehensive Cancer Center with 5 RadOnc sites
- 3 sites all aligned with main campus
- 2 additional member sites that maintain separate tax IDs
- 1 member site brought into main campus team as part of this work

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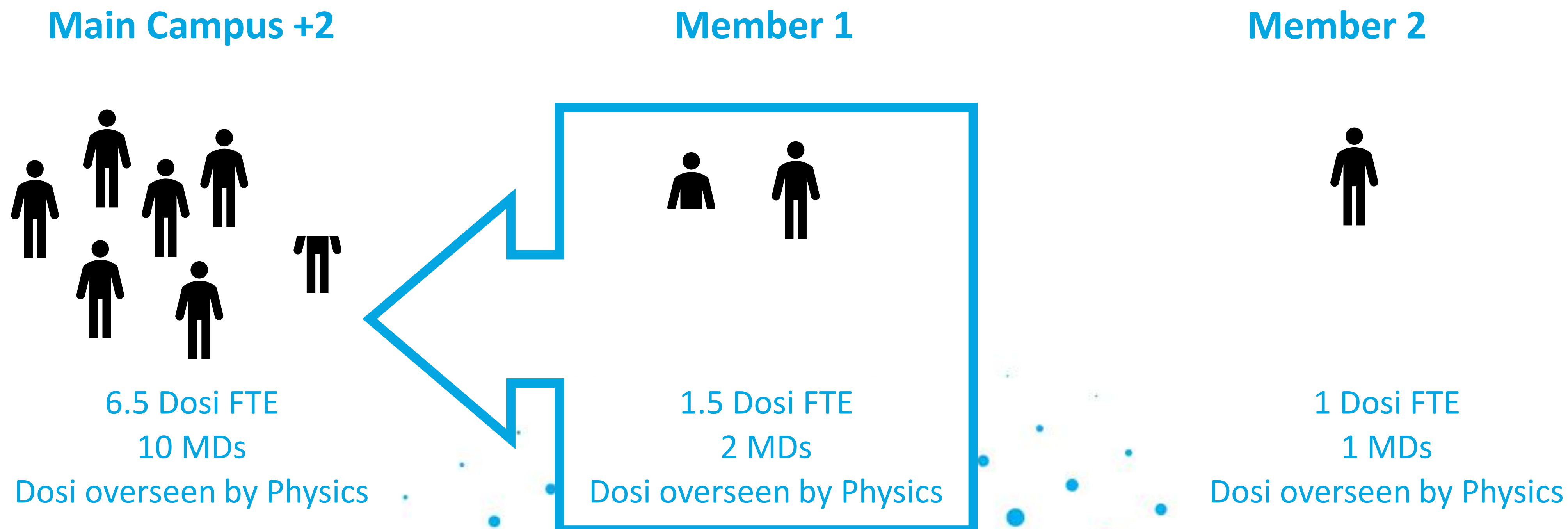
Case Study: Background

Staffing Model



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Case Study: Background

- Work team assembled to discuss workflow differences & build “our way”
- Team:
  - Main Campus: Chief of Physics, Admin Director, Chief Therapist
  - Member: Physicist, Medical Director
  - Shared: Dosimetrist

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Step One:
It Starts With A List

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Step One: It Starts With A List

- Shared dosimetrist between Main Campus and Member site built a list of all workflow differences between sites
- Made recommendations on preferences from dosi perspective
- Shared staff are best, but not required to build list
- Visualization tools can be helpful

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Cheshire and Lebanon/St J Integration Discussion: Differences that affect Dosimetry

Simulation Differences:

- Different naming conventions for setup devices.
  - We had worked on this in our previous integration meetings and I believe came up with similar nomenclature to describe devices and setups. I am not sure if these are still in use at both facilities.
- Isocenter is placed at simulation in Cheshire and tattooed. CAX (tattoo) marks are placed on stable location at simulation in Lebanon/St J
  - Isocenter may be moved on occasion in Cheshire if necessary and more than 2cm
  - Isocenter is regularly placed by CMDs and moved off of tattoo/CAX
- Nomenclature for naming scans and courses is different
  - We had worked on standardizing this in our previous meetings, but did not finish.

Dosimetry Differences:

- Treatment planning directive in Cheshire vs. none in Lebanon/St J.
- 2 arcs for VMAT plans in Cheshire vs. 3+ in Lebanon when needed for bigger volumes
  - Unless dose rate stays above 200 for Cheshire-per Erli
  - The thought process on this seems to be changing now that Dr. Park is reviewing plans. She is okay with 3+ if it makes the plan better.
- Previously mentioned isocenter movement by CMD in Lebanon/St J. vs. do not move isocenter in Cheshire
- Jaw tracking is always on because only one Truebeam machine and all fields can be retained as one for e comp in Cheshire.
- Cheshire uses status icons more regularly than Lebanon/St J.
- Different isodose lines for Dr. Levene
  - Dr. Park uses DH isodose lines
- Prone breasts in Cheshire/SBRT in Lebanon/St J.
- Structure templates are different
- ClearCheck templates are sometimes different
  - This is being dealt with through SSEMs now so I imagine the last few we are using for Cheshire independently will be changed to standard once those sites meet.
  - Plan checks are different for Cheshire vs. Lebanon/St J.
- Dosimetry completion/Paperwork is much different for the two sites
  - There is a Cheshire plan report vs. a Lebanon/St J. plan report
    - The setup report and clearcalc are the same for both
  - No DRR drawings in Cheshire vs DRR drawings in Lebanon/St J.
  - DRR field sizes are not set up in Cheshire because the RTTs do these on the machine vs. DRR field size is set by CMD in Lebanon/St J.
  - Orthogs and CBCTs are not scheduled by CMD in Cheshire. They are scheduled by RTTs when needed. In Leb/St J. they are scheduled by CMDs for all fractions.

Step Two:

Iterate!

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Step Two: Iterate

- Series of workgroup meetings held to prioritize the areas of difference and make a plan for implementation
- Consistent reinforcement that we were “building the DCC way” helped to overcome Big Feelings
- Physician participation was critical to success

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Step Two: Iterate

- Iteration 1: The List moved to Excel to facilitate sizing (XS-XL) and prioritization
- Consistent reinforcement that we were “building the DCC way” helped to overcome Big Feelings
- Resist the urge to fix things at this stage

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INSTRUCTIONS

* Use a scale from 1 (highest priority) to 5

** Use a scale from XS (too small to represent its own story) to XL (too large to be its own story and should be divided) to estimate the amount of time you believe each story will take to document. Implementation effort will be estimated separately

DCC Dosimetry Alignment Opportunities				Notes
Group/ Story	**Title**	**Priority***	**Size****	
Group 1.0	**Simulation**			
~~1.1~~	~~Naming convention for setup devices~~			Had worked on this inprevious integration meetings; Not sure if nomenclature developed to describe devices and setup is still in use at both facilities. --> Not essential to dosimetry, can be removed from
~~1.2~~	~~Isocenter at sim~~			Isocenter may be moved on occasion in Cheshire if necessary and more than 2cm; Isocenter is regularly placed by CMDs and moved off of tattoo/CAX - Sim and treatment difference that will have companion instructions for dosimetry (slightly different starting point, but procedure is aligned) - DI/free breathing: worth detailing due to Vision RT/gating boxes - the Dosimetry portion is aligned
1.3	Naming convention for scans and courses	5	S	Previously worked on nomenclature standardization but did not finish - Scan name (for example): CT_Date, CT_Anatomy_Date - Rescans
Group 2.0	**Dosimetry Practice**			
~~2.1~~	~~Treatment planning directive~~			Treatment planning directive in Cheshire vs. none in Lebanon/St J. --> Dosimetry just needs to know that it is there as a resource in Cheshire. Dosimetry preference would be to include one in Lebanon/St. J; can be raised at the standardization/workflow meeting in Leb
~~2.2~~	~~Arcs for VMAT plans~~			2 arcs for VMAT plans in Cheshire vs. 3+ in Lebanon when needed for bigger volumes; now aligned with Dr. Park's arrival and practice
~~2.3~~	~~Isocenter movement~~			Isocenter movement by CMD in Lebanon/St J. vs. do not move isocenter in Cheshire; same as 1.2 above
2.4	Jaw tracking	2	S	Jaw tracking is always on because only one Truebeam machine and all fields can be retained as one for e comp in Cheshire -> difference in DHMC (equipment difference), so Leb/St. J need to work on procedure and continue to evaluate the propriety of the workflow
~~2.5~~	~~Status icon use~~			Cheshire uses status icons more regularly than Lebanon/St J.
~~2.6~~	~~Isodose lines~~			Not all providers use DH isodose lines

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Step Two: Iterate

- Iteration 2: The List moved from Excel to groups of related stories in Word
- Owners identified → if XS or S can be addressed, do it!
- Scope exclusions identified
- Even more reinforcement that we were "building the DCC way" helped to overcome Big Feelings

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Dartmouth Cancer Center

DCC Dosimetry Harmonization

Area of Focus: Dosimetry to support Radiation Oncology at Cheshire, Lebanon, and St. Johnsbury

Participants: Amanda Plante, Ben Williams, Bethany Marshall, Erli Chen, Janelle Park, Jennifer Willyard

Key:

- **I:** Required before all dosimetrists can be integrated into a single pool
- **P:** Required before dosimetrists can plan for other sites; an "**L**" in this column indicates a limited number of trained dosimetrists could plan for other sites before this item is completely resolved

Group 1.0: Simulation: Stories related to CT simulations

Story	Title	I	P	Definition	Plan/Notes	Owner(s)
1.1	Naming conventions for scans and courses		P	Consistent naming conventions and nomenclature should be developed for all scans and treatment courses	Previously worked on nomenclature standardization but did not finish • Scan name (for example): CT_Date, CT_Anatomy_Date • Rescans Small but low priority work	Amanda, supported by Beth (Erli prefers before Thanksgiving)
Simulation Parking Lot						

Group 2.0: Dosimetry Practice: Stories related to dosimetry impact based on treatment type or assumptions

Story	Title	I	P	Definition	Plan/Notes	Owner
2.1	Jaw tracking		P	Some machines support jaw tracking while others do not; consistent procedure should be developed to support dosimetry practices using a variety of equipment	Jaw tracking is always on because only one Truebeam machine and all fields can be retained as one for e comp in Cheshire -> difference in DHMC (equipment difference), so Leb/St. J need to work on procedure and continue to evaluate the propriety of the workflow 8/24: All will use jaw tracking -> need guidance on EasyFluence from Ben	Ben

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Areas of Accepted Divergence: Below are the content areas that will remain different due to needs of the clinic, differences in technology, etc.

Area	Description
Naming convention for setup devices	Had worked on this in previous integration meetings; Not sure if nomenclature developed to describe devices and setup is still in use at both facilities. --> Not essential to dosimetry, can be removed from list
Isocenter at sim	Isocenter may be moved on occasion in Cheshire if necessary and more than 2cm; Isocenter is regularly placed by CMDs and moved off of tattoo/CAX - Sim and treatment difference that will have companion instructions for dosimetry (slightly different starting point, but procedure is aligned) - DI/free breathing: worth detailing due to Vision RT/gating boxes - the Dosimetry portion is aligned
Treatment planning directive	Treatment planning directive in Cheshire vs. none in Lebanon/St J. --> Dosimetry just needs to know that it is there as a resource in Cheshire. Dosimetry preference would be to include one in Lebanon/St. J; can be raised at the standardization/workflow meeting in Leb
Isocenter movement	Isocenter movement by CMD in Lebanon/St J. vs. do not move isocenter in Cheshire; same as "isocenter at sim" above
Status icon use	Cheshire uses status icons more regularly than Lebanon/St J.
Isodose lines	Not all providers use DH isodose lines

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Step Two: Iterate

- Iteration 3: The List moved from Word groups of related stories to a Gantt chart to visualize overall project
- Items re-grouped into themes of dependency
- Items required prior to go-live identified
- Yet more reinforcement that we were “building the DCC way” helped to overcome Big Feelings

Master Gantt Chart

DCC Dosimetry Harmonization

Please manually change the highlighted date in yellow (left) to begin gantt chart date range. All other dates are calculated autotmatically within a formula.

#	Task Description	Responsible	Status	Start Date	End Date	Comments
1	**Nomenclature-Related Tasks**					
1.1	Naming conventions for scans and	Amanda, Beth	I	09/07/23	11/23/23	Model developed for courses; next level is to
3.6	Field Name Nomenclature	Amanda, Beth	I	09/07/23	11/23/23	Complete, ready to implement; next RTT
4.4	Templates (refer to 1.1)	Ben, Erli, Beth	I	09/07/23	11/23/23	VIP - one for imaging, one for planning
2	**SSEM-Related Tasks**					
2.3	Structure Templates	Jennifer	I	07/01/23	06/30/24	
2.4	ClearCheck Templates and Use	Jennifer	I	07/01/23	06/30/24	
3	**Dosimetry Ops Tasks**					
3.1.a	Plan Reports First Pass	Ben, Erli	C	10/26/23	11/01/23	Erli ran report and shared w/Bethany; pilot w/Cheshire (3.1.b)
3.3	Reference Points	Bethany, Ben	I	09/14/23	09/29/23	Training manual based on Cheshire processes; will review @ dosi mtg 12/28
3.4.a	DIBH Stamp Decision	Amanda,	C	09/14/23	09/29/23	Okay to get rid of from an RTT perspective
3.1.b	Plan Reports Deep Dive	Ben, Erli	I	11/01/23	01/18/24	Pilot running in Cheshire, working well. Need continuity of reports across sites (DIBH was probably last piece, add max dose)
3.2	DRR Guidance	Amanda, Beth	I	10/01/23	11/15/23	Green line removal - pilot with the new L-spine procedures, bone contouring; dosi starts with a bone contour to get them used to it; aim for end of Feb for green line phase-out
3.4.b	DIBH Stamp Downstream Work	Amanda,	C	11/01/23	12/15/23	Captured in treatment log, timeout process
3.5	Setup Image	Amanda, Ben	P	10/15/23	11/30/23	Need to evaluate how RTTs use it in Leb/St. J; broader discussion on setting iso at sim
3.8	Tolerance Tables	Amanda, Ben	P	11/01/23	01/01/24	
3.7	Chart Check Tasks	Ben, Erli	P	01/11/24	01/18/24	
4	**Plan Dev & Approval Tasks**					
3.9.a	Plan Approval - Dosimetry Writeup	Ben, Bethany	C	09/21/23	10/31/23	Bethany shared writeup w/Ben
4.3.a	Carepaths Prework	Ben, Erli, Beth	I	09/21/23	10/31/23	
5.1	Journal Notes (refer to 4.3)	Ben, Bethany,	I	09/21/23	10/31/23	
3.9.b	Plan Approval - MD Ops Presentation	Ben, Jennifer	P	11/13/23	11/17/23	
4.3.b	Carepaths Downstream Work					
5	**Independent Tasks**					
2.1.a	Jaw Tracking: Decision-Making	Ben	P	11/12/23	11/18/23	
2.1.b	Jaw Tracking: Downstream Work	Ben	P	11/19/23	12/30/23	Need to float to MDs prior to go-live
2.2	Prone Breast	Bethany, Dave	P	01/07/24	02/29/24	
3.10.a	Electrons	Ben, Erli	P	11/02/23	11/08/23	
3.10.b	Electrons Downstream Work	Ben, Amanda	P	11/09/23	01/18/24	
4.1	Scans and Fusion	Bethany, IRR	I	09/21/23	12/31/23	
4.2.a	Courses and Prescriptions Prework	Ben	I	09/21/23	10/31/23	
4.2.b	Courses and Prescriptions Downstream					

	09/07/23	09/14/23	09/21/23	09/28/23	10/05/23	10/12/23	10/19/23	10/26/23	11/02/23	11/09/23	11/16/23	11/23/23	11/30/23	12/07/23	12/14/23	12/21/23	12/28/23	01/04/24	01/11/24	01/18/24
Task Count	5	7	12	12	11	11	12	13	12	12	13	12	9	8	8	7	7	4	6	6

Status Legend (drop down menu):	
C	Complete
D	Delayed
I	In Process
P	Planned
	Unknown

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Step Two: HR/Legal Engagement

- While workflow was under development, work began to move the FTEs from the Member to the Main Campus
- OSSA: Member pays for % of pool equal to volume (salary and fringe)
- Chief of Dosimetry position created → all dosimetrist supervision moved from respective physicists to Chief of Dosimetry

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Annual Affiliate Dosimetry FTE and Services Fee Calculator

PSA Start Date	1/7/2024
Reference FY:	2023

	Actual CT Sims
Affiliate	350
D-H	1,373

Grand Total	1,723

Affiliate Volume %	20.3%
Total FTE	8.0
Gross Affiliate FTE	**1.6**

If a new provider joined Affiliate for 6 months or more of the FY, add .2FTE to the Gross Affiliate FTE*

Net Affiliate FTE	**1.8**
Affiliate FTE %	22.5%

Total FTE Salary	
Total FTE Fringe	
Affiliate Monthly Fee	
Affiliate Annual Fee	

*New Affiliate Provider	Janelle Park

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Step Three: Implement (and Control)

- Project and implementation plans developed for anything outstanding
- Team meetings moved to quarterly to ensure forward progress and reduce backslide
- Gantt chart continues to be updated for accountability and to re-prioritize as needed

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Key Takeaways

- Calling out what you will NOT standardize is just as important as calling out what you will
- OUR Way isn’t the Easy Button
- Inertia to revert to old ways is strong
- Ongoing meeting are required to ensure accountability and address anything new you could not anticipate

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Questions and Discussion

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Thank you!

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