

# Open Heart & Device Implant Surgical Site Infections Reporting

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# What to Expect

- A Clinical Perspective: Using REDCap on the frontlines in cardiac surgery to improve patient outcomes



# A Patient Perspective

## What happens if my wound gets infected?

- Time to attend appointments
- Incapacity
- Forgone leisure time
- Income loss
- Costs associated with travel, medication, and home care
- Readmission to hospital
- Increased risk of death



**Resilience** increases  
when things go  
smoothly

**Vulnerability & Frustration**  
increase when complications occur

# A System Perspective

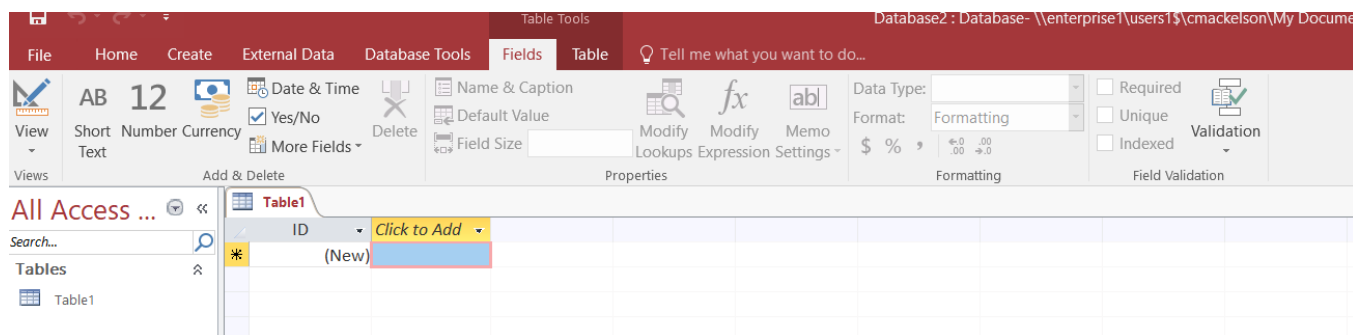
- Bed used for readmission, bumping open heart surgery for someone else
- Cost of Surgical Site Infections varies from \$400 to \$30,000+
  - Skin-deep infection treatable with antibiotics. No need for hospital readmission
  - Deep infection of the sternal wound = \$30,000++ plus readmission to hospital, return to OR, extended stay in hospital



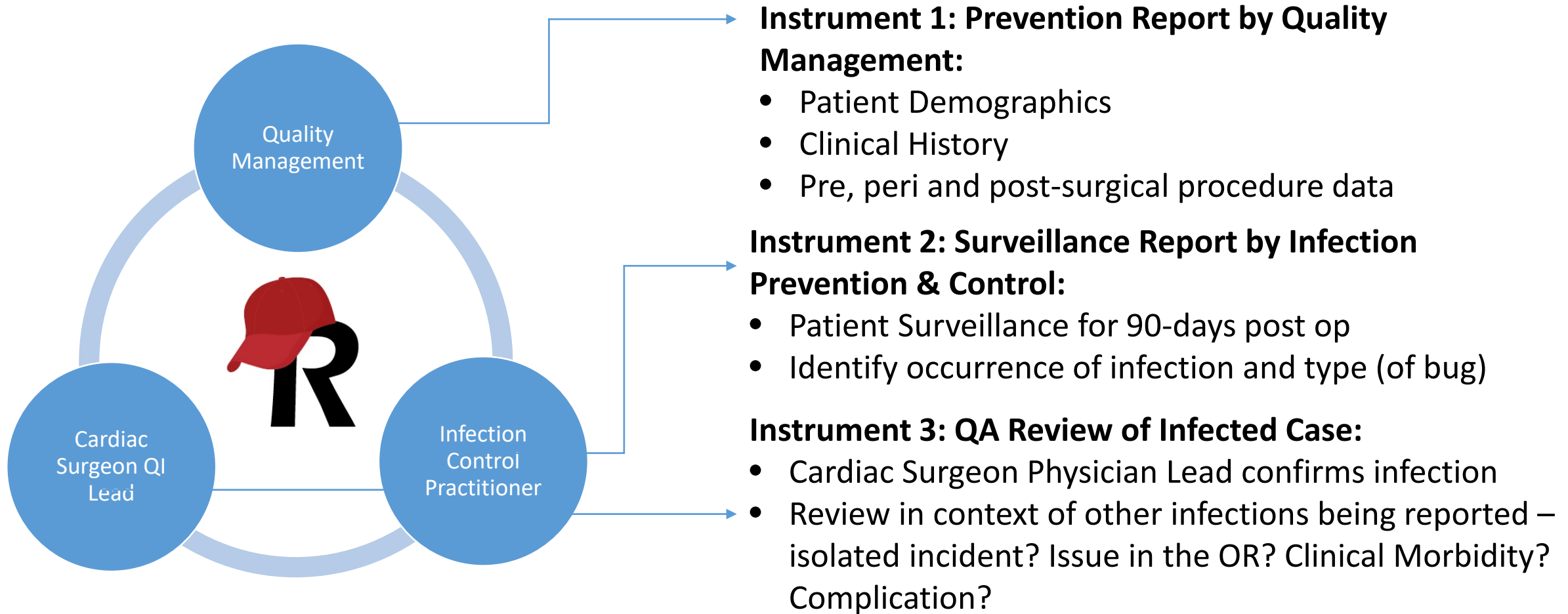
# Life Before REDCap

- Different data platforms used by different team members in different areas of the hospital
- Spreadsheets – duplication of data entry, no privacy constraints, time to build graphs, prone to user error
- ACCESS database: requires expert support, ‘clunky’

ID	Age (yrs)	Gender	Arrival Hospital	C Ambulance Used	EMS Scene	Tir911 Pick-up Time	CAS on Scene	Tir
889		Male	RJH	FALSE				
890		Male	RJH	TRUE				21:11
893		Male	RJH	TRUE				18:36
894		Male	RJH	TRUE				
896		Male	RJH	TRUE				16:16
901		Male	RJH	TRUE				15:53
904		Male	RJH	FALSE				
905		Female	RJH	FALSE				
907		Male	RJH	TRUE				2:44
908		Male	RJH	TRUE				11:34
909		Male	RJH	TRUE				1:45
910		Male	RJH	TRUE				23:08
911		Male	RJH	FALSE				
912		Male	RJH	TRUE				9:38
913		Male	RJH	TRUE				19:51
914		Female	RJH	TRUE				
915		Male	RJH	FALSE				
916		Male	RJH	TRUE				8:59
917		Male	RJH	FALSE				
918		Female	RJH	TRUE	0:15	0:07		
920		Female	RJH	TRUE	10:21	10:10		
922		Male	RJH	TRUE	21:30	21:23		
923		Male	RJH	TRUE				
924		Male	RJH	TRUE	16:43	16:39		
925		Male	RJH	TRUE	13:12	13:08		
926		Male	RJH	TRUE				
927		Male	RJH	TRUE	18:43	18:37		
929		Male	RJH	FALSE				
930		Male	RJH	TRUE	0:58	0:49		
931		Female	RJH	TRUE	21:19	21:08		
932		Male	RJH	TRUE	15:10	15:02		
933		Male	RJH	TRUE	6:24	6:16		
934		Male	RJH	TRUE	8:21	8:14		



# Data Collection



# Data Sharing

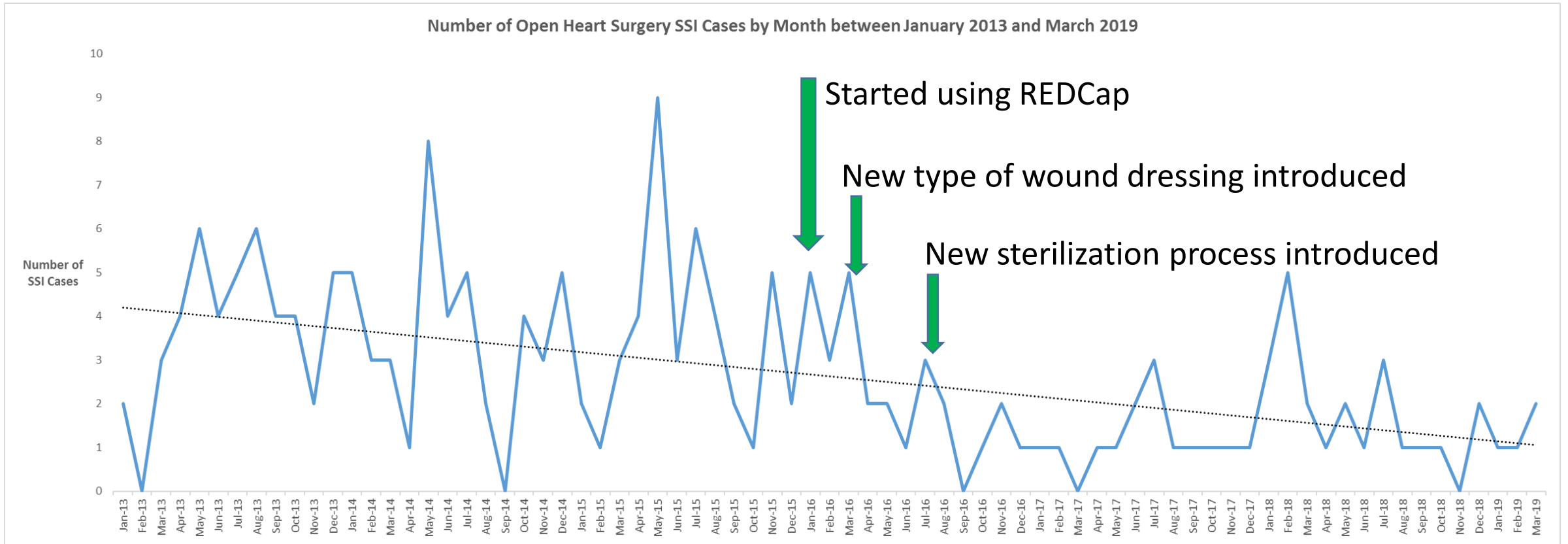
Procedure Date	<input type="text" value="04-03-2019"/> <input type="button" value="Today"/> D-M-Y
Age	<input type="text" value="80"/>
BMI	<input type="text" value="29.26"/>
BSA	<input type="text" value="2.25"/>
NYHA	<input type="text" value="II"/>
Renal Function	<input type="radio"/> Normal <input type="radio"/> Dysfunction <input type="radio"/> Failure <small>Dysfunction: 15 &gt; eGFR &lt; 60</small>
Diabetic	<input type="radio"/> No <input type="radio"/> Type I <input type="radio"/> Type II
CABG	<input type="radio"/> x1 <input type="radio"/> x2 <input checked="" type="radio"/> x3 <input type="radio"/> x4 <input type="radio"/> x5
Patient Clinical History	<div>Hypertension Smoking Quit Date: 01-Jan-1985 Cerebrovascular Disease Cerebrovascular Event Disease Type: CVA-Remote &gt; 2Wks</div> <small>Expand</small>

notes from surgical consult

Infection Case Tracking	<input checked="" type="radio"/> Confirmed <input type="radio"/> Tracking <input type="radio"/> Inconclusive <input type="radio"/> Not a Case
Infected Case Identified by	<input type="checkbox"/> EP Coordinator <input type="checkbox"/> OHS Coordinator <input type="checkbox"/> Pacer / ICD Clinic <input type="checkbox"/> Infection Control Practitioner <input checked="" type="checkbox"/> Physician <input type="checkbox"/> QA Coordinator <input type="checkbox"/> Other
Date Infection Identified	<input type="text" value="02-06-2019"/> <input type="button" value="Today"/> D-M-Y
Where SSI detected	<input type="radio"/> During index procedure admission <input type="radio"/> During readmission to inpatient facility <input checked="" type="radio"/> During visit to emergency or other outpatient clinic
Infection Type	<input type="radio"/> Superficial Sternum <input type="radio"/> Superficial Harvest Leg <input type="radio"/> Deep Sternum <input type="radio"/> Deep Harvest Leg <input checked="" type="radio"/> Organ space <input type="radio"/> Superficial Arm <input type="radio"/> Deep Arm <input type="radio"/> Unknown <input type="radio"/> Pocket <input type="radio"/> Erosion <input type="radio"/> Lead / Positive Blood Culture
Criteria used to identify SSI (check all that apply)	<input checked="" type="checkbox"/> Physician diagnosis <input type="checkbox"/> Positive culture <input checked="" type="checkbox"/> Purulent drainage or material <input type="checkbox"/> Pain or tenderness <input type="checkbox"/> Swelling and/or redness and/or heat <input type="checkbox"/> Fever <input type="checkbox"/> Abscess <input checked="" type="checkbox"/> Incision deliberately opened/drained <input type="checkbox"/> Wound spontaneously dehisces <input checked="" type="checkbox"/> WBC >11 <input checked="" type="checkbox"/> Imaging test evidence of infection <input type="checkbox"/> Other evidence found on direct exam, during invasive procedure or by diagnostic tests <input type="checkbox"/> Other signs & symptoms



# Reporting





# Reporting

	2015/16	2016/17	2017/18	2018/19
<b>Infection Type</b>				
Superficial Harvest Leg	\$260,627	\$122,648	\$61,324	\$45,993
Superficial Sternum	\$168,641	\$61,324	\$107,317	\$45,993
Deep Harvest Leg	\$45,993	\$15,331	\$15,331	0
Deep Sternum	\$150,000	\$30,000	\$180,000	\$150,000
Organ Space	\$270,000	\$120,000	\$120,000	\$150,000
<b>Cost to Health System</b>	<b>\$895,261.00</b>	<b>\$349,303.00</b>	<b>\$483,972.00</b>	<b>\$391,986.00</b>
<b>Rate Per 100 Procedures</b>				
All Open Heart Wound Infections	7.7%	2.7%	3.2%	2.3%
Deep/Organ Space	2.9%	1%	1.6%	1.4%



# Improvements

- Quantified positive change over rapid reporting period providing instant feedback to clinicians
  - New process for telemetry wire sterilization
  - Revisions to RN education in Cardiac Critical Care Unit
  - New type of wound dressing used



# Reasons to Continue



## The REDCap Platform:

- Provides a shared platform that promotes innovation and technology to improve patient outcomes and increases sustainability
- Access to data identifies issues in a timely manner
- System is nimble and users do not need to be 'techy' to build / use it!



## The REDCap Consortium:

- Keeps adding new features to the platform to keep up with technology
- It's a great forum to share experiences and benefit many others
- It has created a great atmosphere of collaboration around the globe!



# Thanks!

- Blair Ranns, Infection Prevention & Control Epidemiologist
- Infection Prevention & Control Practitioners
- Dr Lynn Fedoruk, Cardiac Surgeon & Division Chief, Cardiac Surgery
- Cardiac Surgeons
- Cardiac Anesthesiologists
- In-patient cardiac surgery ward RNs / PTs / Social work
- Heart Health Patient Advisors
- Victor Espinosa & Nathan Kelerstein (Island Health REDCap)



# Questions & Follow-Up

Find us later or contact us after the conference!

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