"New" *Legionella* Guidelines for Hospitals

Water Quality in Health and Aged Care Facilities
Australian College for Infection Prevention and Control
14th August, 2017

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queensland

Legionnaire's disease death of man, 60, at Brisbane's Wesley Hospital

This story was published: 3 YEARS AGO | JUNE 05, 2013 6:00PM

SCENE: The Wesley Hospital was relatively calm this afternoon. Picture: Marc Robertson *Source: The Courier-Mail*

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SCIENCE

Wesley Hospital Contacts Former Patients Amid Legionnaires' Disease Outbreak; Second Case Now In Intensive Care

By Frances Samson on June 06 2013 11:50 AM

Authorities at the Wesley Hospital in Brisbane have contacted around 1,400 former patients in the wake of rising concern over the latest outbreak of Legionnaires' disease.

2013 *Legionella pneumophila* outbreak investigation

A review by the Chief Health Officer of the prevention and control of *Legionella pneumophila* infection in Queensland was initiated at the request of Health Minister, the Honourable Lawrence Springborg, on 6 June 2013.

The purpose of the review was to:

- investigate the circumstances surrounding the notification of and response to Legionnaires' disease in two patients, and the subsequent death of one patient, at The Wesley Hospital in Queensland in late May and early June 2013
- make recommendations regarding the future management of *Legionella pneumophila* in Queensland.

Read the Chief Health Officer's findings, conclusions and recommendations (PDF 379kB).

2013 test results

On 7 June 2013, Queensland's 17 Hospital and Health Services were directed, and 103 private and day hospitals and health facilities were requested, to test their potable water systems for Legionella.

View the test results (XLS 87kB) which informed the Chief health officer's review.

https://www.health.qld.gov.au/clinical-practice/guidelines-procedures/diseases-infection/diseases/legionnaires/default.asp

JUNE 7 2013

Questions raised about hospital's handling of legionnaires' outbreak

Marissa Calligeros

4 comments

The Wesley Hospital, in Brisbane's inner-west. Photo: Australian Traffic Network

In a very short time…

- CHO's report (containing state and national recommendations)
- Three hospital water/legionella management guidelines
- New Australian Standard
- QLD Public Health Act change

Chief Health Officer Branch

Review of the prevention and control of *Legionella pneumophila* infection in Queensland

Chief Health Officer's report

September 2013

…there is no evidence that current or past government climate change and energy efficiency policies and programs have promoted unsafe practice or contributed to any increase in risk of contracting Legionella pneumophila infection.

Great state. Great opportunity.

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CHO's Recommendations

1. All public and private hospitals and public residential aged care facilities be required (and private residential aged care facilities be requested) to develop water quality risk management plans and perform periodic testing based on risk.
2. Strengthen legislation relating to design, commissioning, installation, operation and maintenance of water delivery systems in hospitals/ACFs (update the Public Health Act 2005).
3. MOU between regulatory agencies to articulate the roles of each agency with respect to Legionella risks in hospitals/ACFs.

CHO's Recommendations

4. National collaboration

- Update AS 3500.4 to include warm water systems
- Update AS 3666.2 operation and maintenance of warm water systems
- Specific requirements for drinking water system design/installation/commissioning in hospital/ACFs
- Guidelines for operation and maintenance of DWS for hospitals/ACFs
- Review accreditation processes

5. Upgrade Notifiable Conditions System

6. Review community information on how to minimise *Legionella* risk.

Centre for Healthcare Related Infection Surveillance and Prevention
& Tuberculosis Control

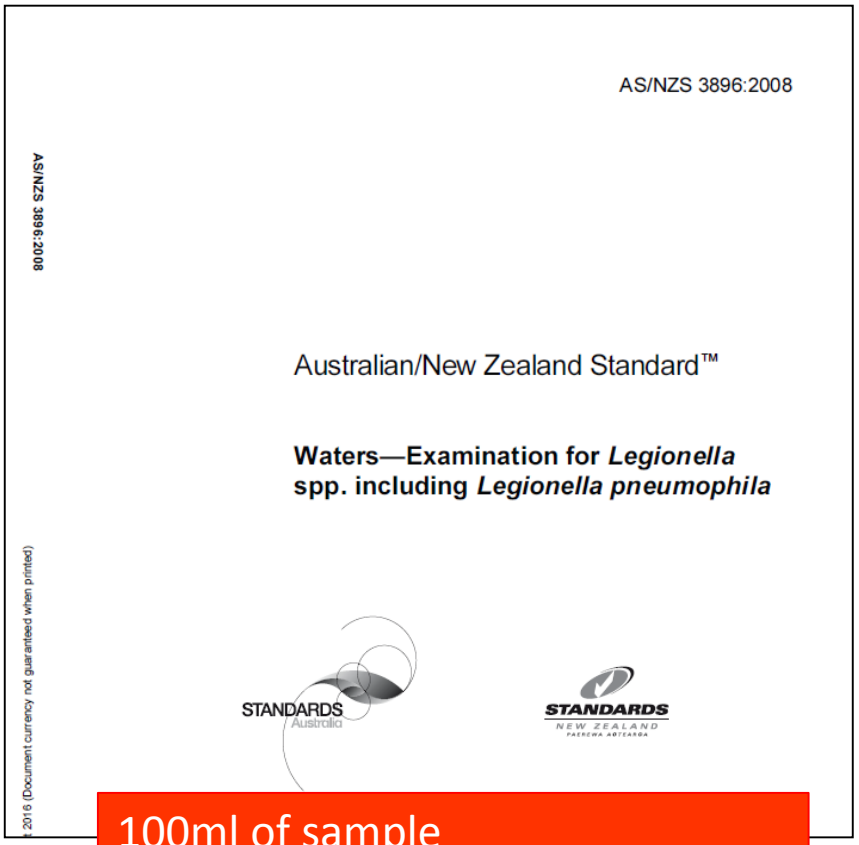
GUIDELINE

Patient management response if Legionella detected in water supply

Guidelines for Managing Microbial Water Quality in Health Facilities 2013

Queensland Government

New Australian Standard


AS/NZS 3896:2008

AS/NZS 3896:2008

Australian/New Zealand Standard™

Waters—Examination for *Legionella* spp. including *Legionella pneumophila*

STANDARDS Australia

STANDARDS NEW ZEALAND

2016 (Document currency not guaranteed when printed)

100ml of sample
Detection Limit: 10cfu/ml

AS 5132:201X

Waters with Low Microbial Levels – Examination for *Legionella spp*. Including *Legionella pneumophila*

FOREWORD: This Standard stems from a need, expressed by health authorities and other stakeholders, for a standard method for the enumeration of legionellae in treated water systems, particularly reticulated water systems supplying warm water. Such water systems have been implicated in cases and outbreaks of legionellosis.

1L of sample
Detection Limit: theoretically 0.1cfu/ml

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Media Statements

Minister for Health and Minister for Ambulance Services
The Honourable Cameron Dick

Thursday, May 26, 2016

Queensland adopts compulsory legionella reporting as new laws pass Parliament

Queensland will now have some of the most stringent water risk management requirements for hospitals and residential aged care facilities in Australia after new laws were passed in State Parliament today.

Minister for Health and Ambulance Services Cameron Dick said the successful passage of the Palaszczuk Government's Public Health (Water Risk Management) Amendment Bill 2016 meant Queensland's hospitals, private health facilities and public residential aged care facilities would now be required to develop robust water risk management plans.

"These new laws are the most stringent in Australia when it comes to water risk management in hospitals and residential aged-care facilities and they build on current international best practice in legionella risk management in these spaces," he said.

"They will improve the management and control of health risks associated with water use and supply in Queensland's hospitals and aged-care facilities, better protecting some of our most vulnerable Queenslanders against nasty illnesses like those associated with legionella bacteria."

Mr Dick said the changes also required the person in charge of a facility to notify the Department of Health within one business day after becoming aware of a test result confirming the presence of legionella bacteria.

"This will ensure the Department of Health is aware of the detection and will enable the Department to

Legionella testing in Queensland hospitals 2013

› Legionella 2013 hospital test results

Legionella 2013 hospital test results

Legionella test results, and recommendations for public and private hospital facilities' hot water systems following the 2013 outbreak.

Download (87 KiB) (XLS)

Additional information

Field	Value
Last updated	03/02/2016
Created	11/12/2014
Next review	01/11/2015
Format	XLS
Size	87 KiB
Licence	Creative Commons Attribution

Water risk management in QLD healthcare facilities

- Recent amendment to Public Health Act 2005
  - Improve management and control of health risks associated with the supply and use of water in hospitals and residential aged care facilities (in particular health risks associated with Legionella bacteria)
  - Provide for greater transparency of water testing activities being undertaken by these facilities
- Must comply from February 2017
  - Hospitals (public and private), RCFs

Facilities in QLD will be required to

- Develop a water risk management plan
- Ensure water risk management plans are complied with
- Notify the chief executive of the Department of Health, within one business day, when it is confirmed that *Legionella* has been detected in water used by a prescribed facility
- Submit periodic reports summarising the results of *Legionella* tests for a prescribed facility.

Legionella bacteria found in Qld hospital

Published: 4:58 pm, Friday, 8 July 2016

More Queensland Local News

- Qld govt has no plans for prison upgrade
- Tiahleigh incest accused bashed in prison
- Qld boy 'lucky' after escalator fall

Clinical Infectious Diseases

MAJOR ARTICLE

Hospital-wide Eradication of a Nosocomial *Legionella pneumophila* Serogroup 1 Outbreak

Paul B. Bartley,[1,2,a] Nouri L. Ben Zakour,[3,4,a] Mitchell Stanton-Cook,[3,4] Raghuram Muguli,[5] Luis Prado,[1,2] Vyt Garnys,[5] Katherine Taylor,[2] Timothy C. Barnett,[3,4] Glen Pinna,[6] Jennifer Robson,[7] David L. Paterson,[4,8] Mark J. Walker,[3,4] Mark A. Schembri,[3,4] and Scott A. Beatson[3,4,a]

[1]School of Medicine, University of Queensland, Herston, [2]Wesley-St Andrew's Research Institute, Auchenflower, [3]School of Chemistry and Molecular Biosciences, and [4]Australian Infectious Diseases Research Centre, University of Queensland, St Lucia, [5]CETEC Pty Ltd, Melbourne, [6]Biotech Laboratories Ltd, and [7]Sullivan Nicolaides Pathology, Brisbane, and [8]University of Queensland Clinical Research Centre, Herston, Queensland, Australia

Background. Two proven nosocomial cases of *Legionella* pneumonia occurred at the Wesley Hospital (Brisbane, Australia) in May 2013. To trace the epidemiology of these cases, whole genome sequence analysis was performed on *Legionella pneumophila* isolates from the infected patients, prospective isolates collected from the hospital water distribution system (WDS), and retrospective patient isolates available from the Wesley Hospital and other local hospitals.

Methods. *Legionella pneumophila* serogroup 1 isolates were cultured from patient sputum (n = 3), endobronchial washings (n = 3), pleural fluid (n = 1), and the Wesley Hospital WDS (n = 39). Whole genome sequencing and de novo assembly allowed comparison with the *L. pneumophila* Paris reference strain to infer phylogenetic and epidemiological relationships. Rapid disinfection of the hospital WDS with a chlorinated, alkaline detergent and subsequent superchlorination followed by maintenance of residual free chlorine, combined with removal of redundant plumbing, was instituted.

Results. The 2011 and 2013 *L. pneumophila* patient isolates were serogroup 1 and closely related to all 2013 hospital water isolates based on single nucleotide polymorphisms and mobile genetic element profiles, suggesting a single *L. pneumophila* population as the source of nosocomial infection. The *L. pneumophila* population has evolved to comprise 3 clonal variants, each associated with different parts of the hospital WDS.

Conclusions. This study provides an exemplar for the use of clinical and genomic epidemiological methods together with a program of rapid, effective remedial biofilm, plumbing and water treatment to characterize and eliminate a *L. pneumophila* population responsible for nosocomial infections.

Keywords. bacterial genomics; genomic epidemiology; Legionnaires' disease; hospital disinfection; transmission pathway.

What happened at TWH in 2013

- Patient 1 – 66yo male, cardiac ward East Wing, Apr 12th 2013, severe pulmonary oedema due to myocardial amyloidosis from multiple myeloma
- Methylprednisolone, cyclophosphamide, bortezomib
- May 27th 2013 (same single room) – developed severe, bilateral, multilobar pneumonia
- Died despite Abx (incl. ciprofloxacin, azithromycin) on June 2nd 2013
- Sputum, pleural fluid cultured LPSG1, urinary antigen detected (BinaxNOW), identified to species level using Maldi-ToF MS.

What happened at TWH in 2013

- Patient 2 – 46yo female, admitted to oncology transplant ward Main Block May 1st 2013 with AML, commenced remission-induction chemotherapy
- May 25th RLL, broad spectrum Abx and empiric caspofungin, progressive resp failure requiring artificial ventilation on June 4th
- Antigenuria detected June 4th, bronchial washing cultured LPSG1 June 7th
- Discharged 3 months later

What happened at TWH 2011

- Patient 3 – in October 2011, 73yo male who was nursed in the same ward as Patient 2, cultured LPSG1 from BAL.
- Secondary AML that relapsed after an allograft 2009
- Developed severe HAP and died.

Timeline

- Patient 1 Urinary Ag detected 27/5/2013
- Patient 1 died 02/6/2013
- “Confirmed Dx Patient 1” 04/6/2013
- Positive water samples 05/6/2013
  - (collected 29/5/2013 showerhead/taps patient 1 room)
- Confirmed Dx Patient 2 05/6/2013
- Closed to admissions 05/6/2013
- Lab review identified Patient 3 from 2011 12/6/2013
- East Wing reopened 19/6/2013
- Moorlands Wing reopened 26/6/2013
- Whole hospital reopened 02/7/2013

TWH response

- Culture of water from point of use at the origin, midpoint and end of every plumbing circuit.
  - Baseline, before WDS disinfection, then
  - Daily for 7 days, then
  - Weekly for 6 weeks, then
  - Second weekly for 6 weeks, then
  - Systematic testing of circuits on an annual basis

TWH response

At baseline, LPSG1 detected* in 17.6% of water outlets (mainly basins, showers)

- 5/7 in east wing
- 2/12 in Moorlands wing
- 8/34 in main block
- 2/32 in co-located medical centres

* Concentration of >or= 10cfu/ml

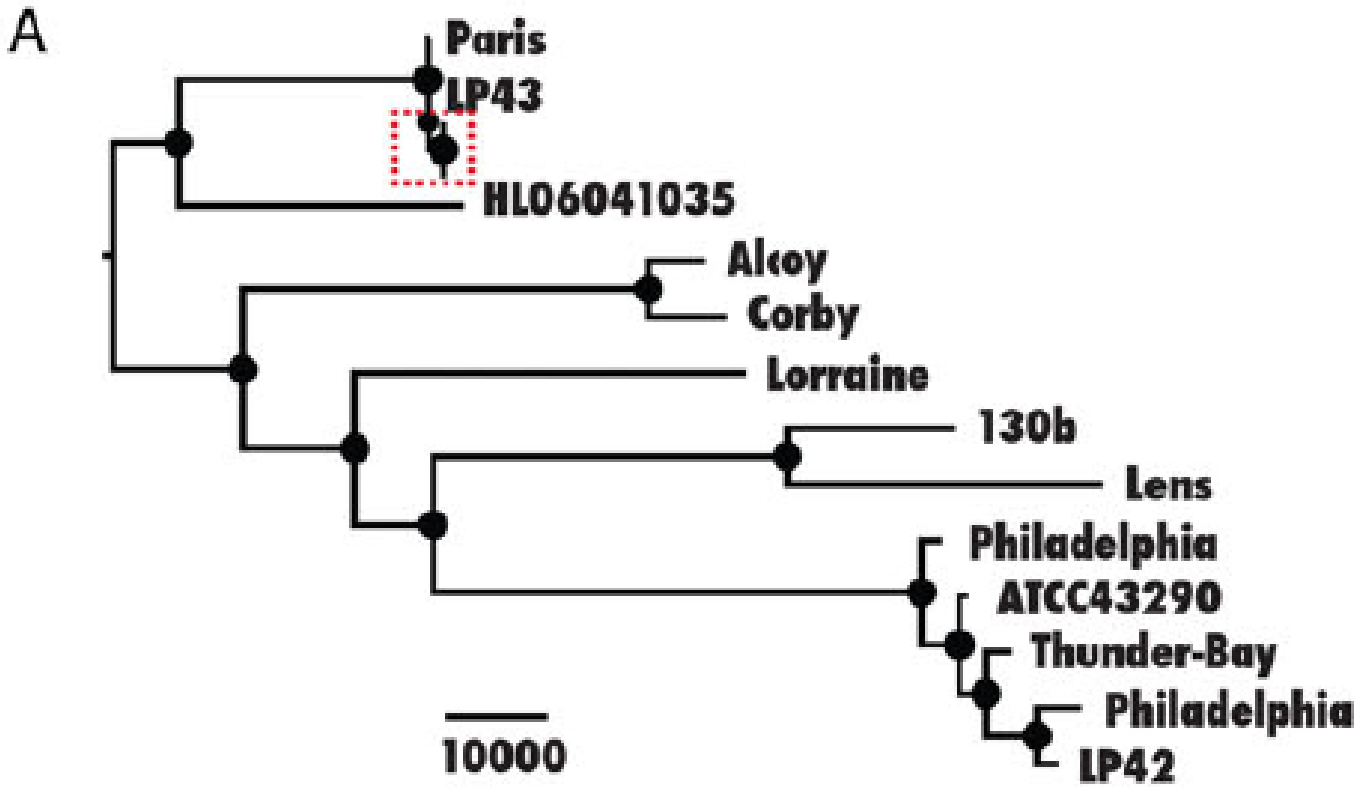
Genomic Investigation

- 46 LPSG1 isolates, including
  - 5 clinical isolates (LP44-48)
  - 6 potable water isolates from both patients' rooms
  - 2 historical clinical isolates (different hospitals, 2000 and 2001)
  - 35 other tap water isolates from TWH
  - 1 isolate from contaminated TMV from TWH

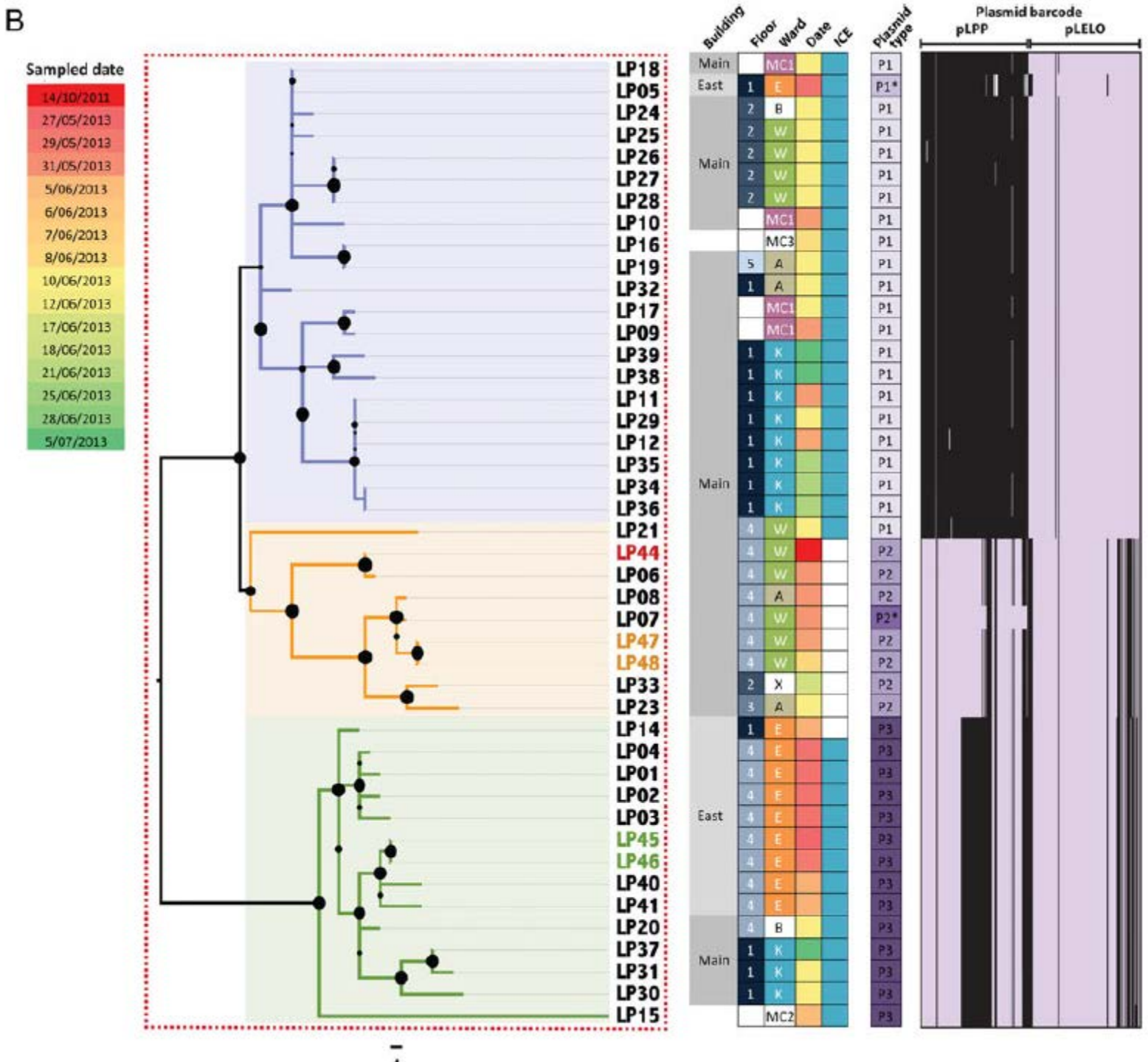
Genomic Investigation

- Australian Genome Research Facility (Melbourne)
- Illumina HiSeq with 100bp pair-ended reads
- Sequence mapping against reference strain *L.pneumophila* Paris with Shrimp2 and Nesoni software.
- Whole genome comparison analysis (Velvet de novo assembly then Mauve, BLAST, Artemis Comparison Tool, BRIG, Seqfindr).
- Phylogenetic trees based on core SNPs (Nesoni, RAxML 7.2.8 with GTR+GAMMA substitution model and 1000 bootstrap replicates).
- Plasmid profiling

Maximum of likelihood phylogenetic tree built using 188 602 SNPs relative to Paris LP strain.



Red dotted box corresponds to the collapsed branch of all strains from 2013 TWH outbreak AND LP44 (2011 patient).


B
Sampled date
14/10/2011
27/05/2013
29/05/2013
31/05/2013
5/06/2013
6/06/2013
7/06/2013
8/06/2013
10/06/2013
12/06/2013
17/06/2013
18/06/2013
21/06/2013
25/06/2013
28/06/2013
5/07/2013
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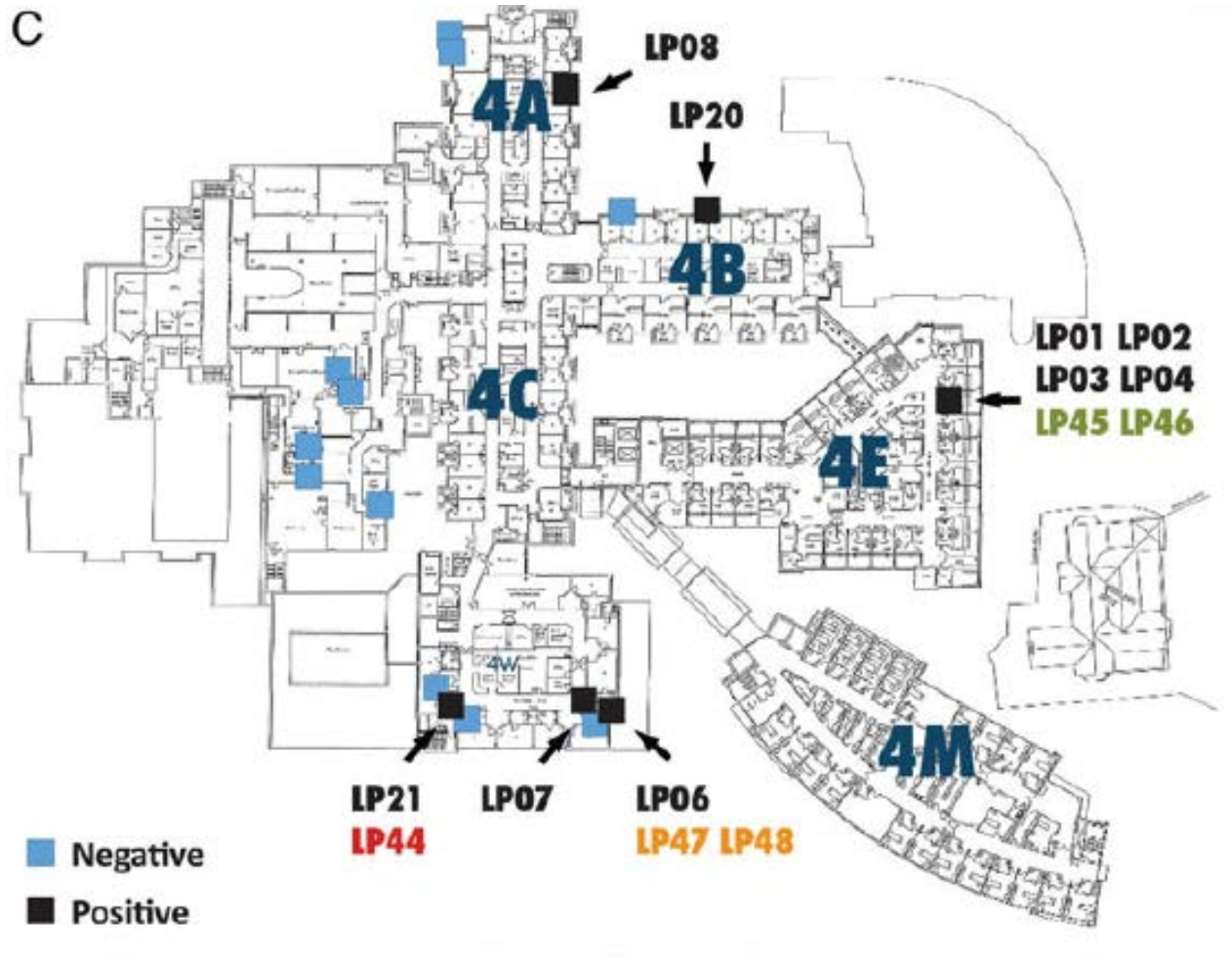
LP40
LP41
LP20
LP37
LP31
LP30
LP15
Building
Floor
Ward
Date
ICE
Plasmid type
Plasmid barcode
pLPP
pLELO
Main
East
Main
Main
East
Main
P1
P1*
P2
P2*
P3



Map of Level 4: negative samples blue, positive samples black.
Patients: **LP44(red)=2011; LP46(green)=1st pt 2013; LP47(yellow)=2nd pt 2013.**

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Genomic Investigation

- 3 major sub clonal populations that correspond to geographically distinct sections of the hospital plumbing system.
- Enabled the link between infected patients who shared the same ward in 2011 and 2013 to be unequivocally established.

TWH response

- Mapping of entire hospital Water Distribution System (WDS)
  - East wing 2009
  - Moorlands wing 1999
  - Main block 1978 and extended 4 x since
  - Coloured food dye
  - All hot water systems are electrical and reservoirs are held at 70°C
  - By law, hot water at point of use must be 43-45°C
  - Temperature reduction achieved through thermostatic mixing valves (TMVs) – no further than 4m from point of use (by law)

TWH response

- Patient management
  - Closed to new admissions
  - Postponed elective surgery and chemo
  - Buildings evacuated before sequential WDS disinfection
  - Concerned patients were offered urinary antigen tests (77 tests, no true positives)
  - Phone hotline to contact and recall over 2000 recently-discharged patients (none had respiratory infection)

TWH response

- WDS disinfection
  - Install one-way backflow-prevention valves to isolate the WDS of each of the buildings to prevent recontamination of “cleaned” buildings
  - Hot water scald - 60°C for 10mins, confirmed at POU (5/89 remained positive 24 hours after scalding)
  - Biofilm micronised and removed with 3 cycles of alkaline detergent (pH=10)
  - Hyperchlorination to 10ppm.
  - 3 cycles
  - Monthly chlorine levels at POU (2ppm)
  - In-line chlorinators installed in each building

CETEC
Professional Scientific Solutions

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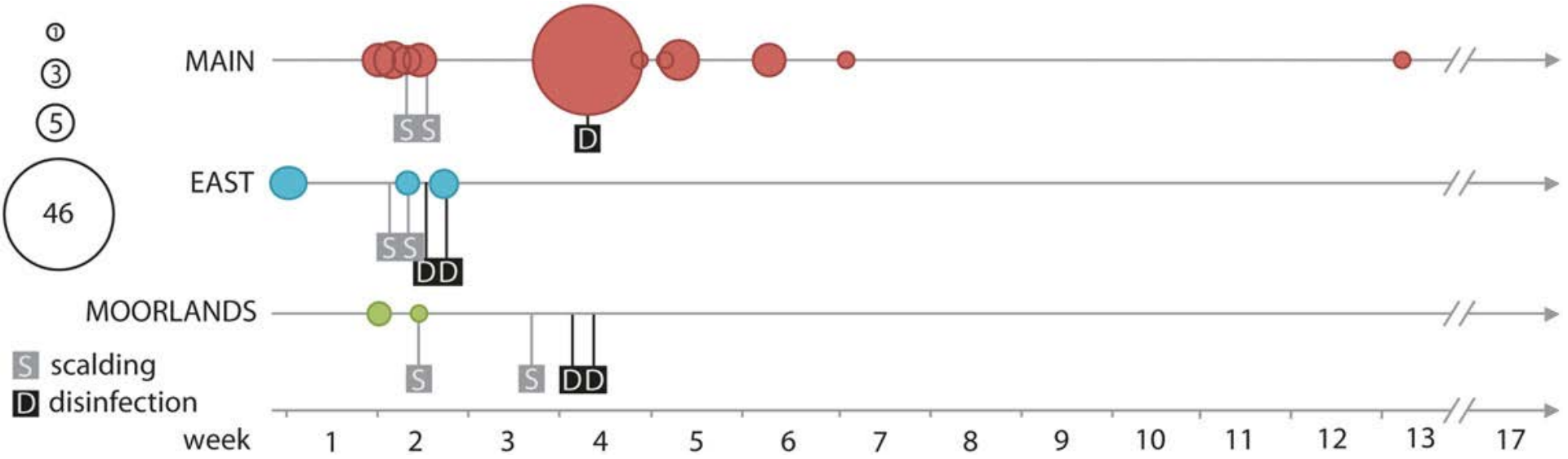
Distribution of positive samples collected in all buildings during the initial control phase of the Wesley Hospital Legionella outbreak



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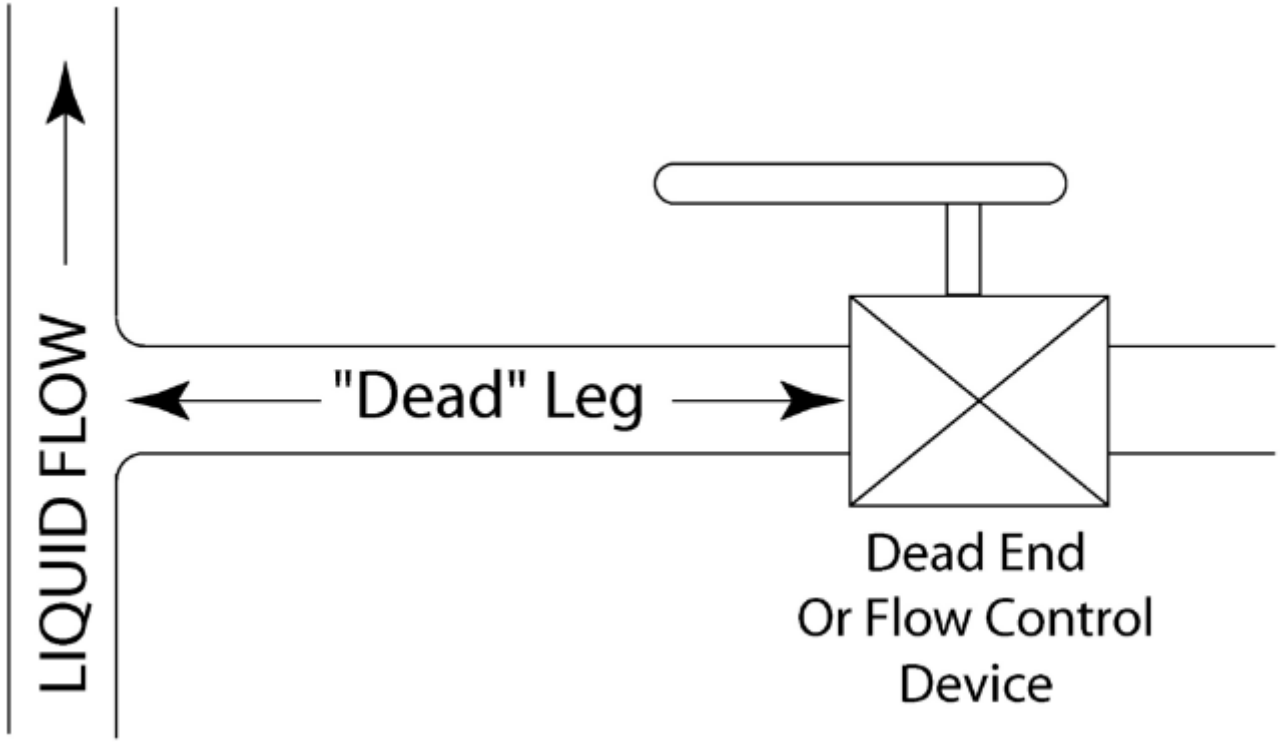
TWH response

- Mapping and removal of dead-legs
  - Over 750 have been removed to date
  - E.g. design changes halfway through construction: sinks were to be installed in doctor's offices in each of the 6 wards in the new wing – but were never installed after the plumbing.
- POU filters
  - Recurrent culture positivity in Main block so POU filters were put on all showers and tap heads as most haem/onc patients are accommodated in this block

“Dead” leg



TWH response

- Pneumonia review
  - TWH Medical Administration requested review of
    - all cases of pneumonia from 2008-2013
    - Deceased patients from 2011-2013 where “pneumonia” was listed in the ICD coding
    - (<40% were adequately tested)
    - 2 Pathology providers – all Legionella serology and urine antigen requests originating from TWH from 2008-2013 (LPSG1 >512, positive cultures/PCR, antigenuria)
    - Doubled rate of Legionella testing in pneumonia cases at TWH
    - Updated pneumonia Ix and Rx guidelines (ID, ED, Gen Med, ICU, Resp Med)

TWH response

- Physical Water Parameters
  - By law: hot water 42.5-45°C to prevent burns
  - Cold water typically 21-22°C in Winter (sub-tropical city)
  - Chlorine levels were measured initially during WDS disinfection to confirm 10ppm at POU, then systematically monitored and recorded from December 2013
  - Recurrent culture positivity despite adequate chlorination (2.2ppm)

Guidelines for

LEGIONELLA CONTROL

in the operation and maintenance
of water distribution systems
in health and aged care facilities

enHEALTH

WA DOH

"has committed to adopt the "*enHealth Guidelines for Legionella control in the operation and maintenance of water distribution systems in health and aged care facilities*" for all state funded healthcare facilities in WA, but a specific timetable for the rollout has not yet been set."

SCGH experience

- Just decided to start, needed to upgrade our hospital's Infection Prevention and Control Unit guidelines for control of Legionella in water storage and distribution systems anyway.
- Decided to follow enHealth for structure, wording, guidance.
- Didn't expect it to be easy….but
  - Accepted it was going to take some time.
  - It was do-able.
- Risk Management Plan for Legionella Control in the operation and maintenance of the waters systems of Sir Charles Gairdner Hospital" in final draft form
  - 13 meetings
  - Over 1 year

1st Agenda
30th May 2016

1. Welcome and apologies
2. TOR
3. enHealth document review
4. Timelines
5. Risk assessment – allocation of tasks
6. Documentation
7. New Business

TOR

- Purpose
  - “guidance and advice”
  - Potable water and cooling towers
  - *Legionella* (vs total water quality management)
- Objectives
  - review the enHealth guideline and establish a *Legionella* risk management system
  - develop and document a *Legionella* risk management plan
  - review document control and record keeping in relation to *Legionella* control
  - identify gaps in compliance that relate to the purpose of the working group
  - promote compliance with the National Safety & Quality Health Service Standard 3

TOR

- Membership
  - Coordinator, Infection Prevention and Control (Senior IPC practitioner for SCGH)
  - Infection Prevention and Control Officer (Head of Microbiology, Clinical Microbiologist and Infectious Diseases Physician)
  - Clinical Microbiologist overseeing the Waters Laboratory
  - Clinical Microbiologist with experience in Legionella testing and outbreak investigation
  - Facilities Manager (plus assistant)
  - Patient Support Services Manager (cleaning)
  - Manager, Emergency Management Services
  - Director, OSH (doctor)

TOR

- Chair
- Secretariat
- Reporting
- Conflicts of Interest
- Operating Procedures
  - Meetings (e.g. monthly, plus ad hoc)
  - Quorum
- Record keeping
- Confidentiality

Risk management plan for

LEGIONELLA CONTROL

in the operation and maintenance of the water systems of

Facility name

Facility name	
Facility address	
Responsible person	

Revision history

Revision	Comment	Date	Initials

Contents

Advisory note

This template has been provided to assist in the development of a risk management plan for *Legionella* control based on the information and processes described in the enHealth *Guidelines for Legionella control in the operation and maintenance of drinking water distribution systems in health and aged care facilities*.

Advisory information has been included in certain sections to assist with the interpretation and completion of relevant plan details. It is expected that this content will be either deleted or replaced with content specific to your facility in your final document.

In the event of complicated plumbing infrastructure, positive *Legionella* test results that are not easily controlled via the implementation of measures within the plan, an outbreak of Legionnaires' disease, or lack of confidence in in-house ability to prepare the plan, external expert assistance should be sought.

2. Risk Analysis

- Reviewed the literature on nosocomial Legionellosis
- Reviewed the relevant state and national guidelines
- Reviewed our site

Relevant state and national guidelines

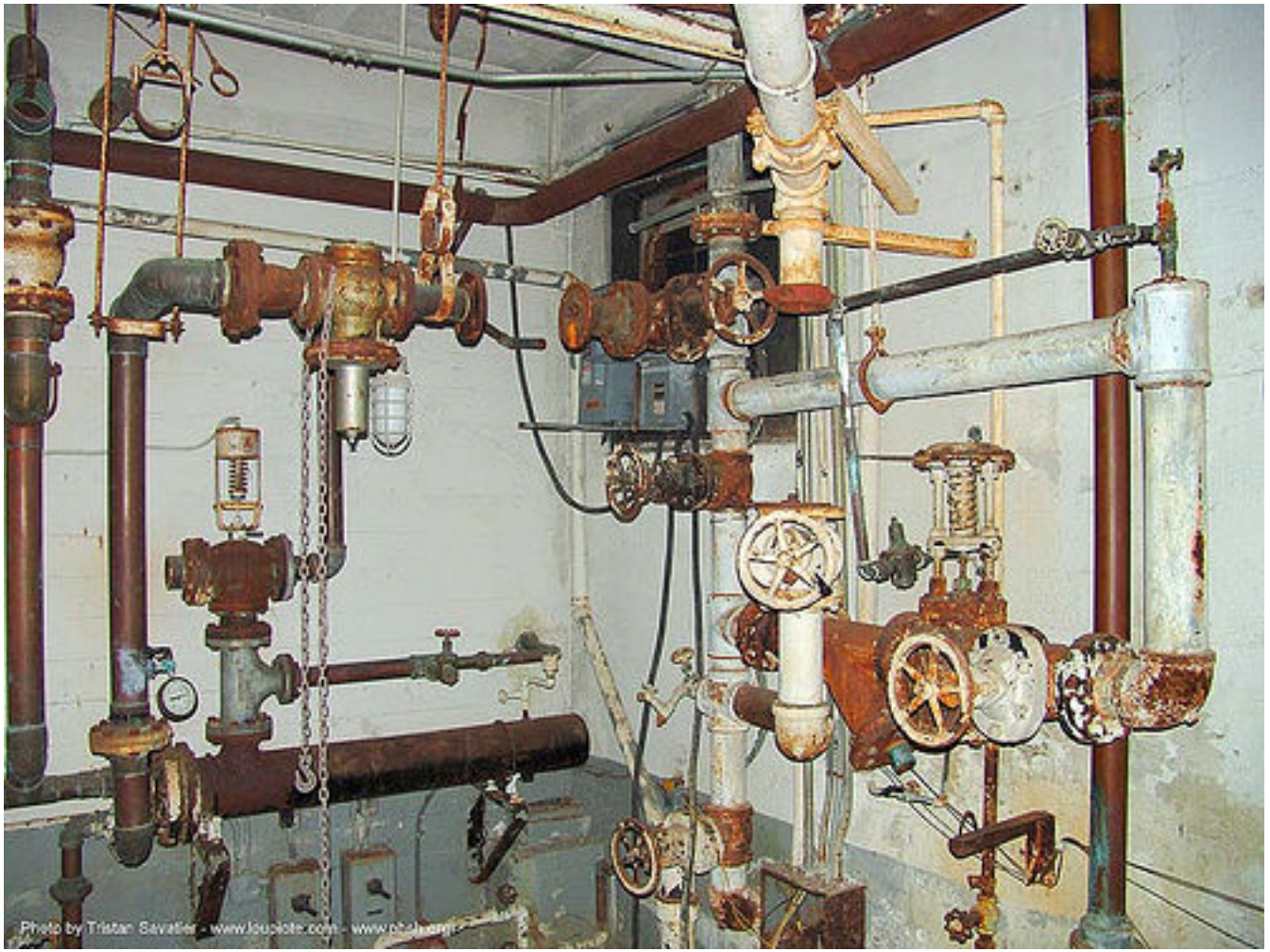
- enHealth Guidelines for Legionella Control in the operation and maintenance of water distribution systems in health and aged care facilitates (2015)
- The Government of Western Australia Department of Commerce, Department of Mines and Petroleum Code of practice for Prevention and control of Legionnaires' disease 2010
- Queensland Government Guidelines for Managing Water Quality in Health Facilities 2013.
- Queensland CHRISP Guideline for Patient Management Response if Legionella Detected in Water Supply 2013
- Australian Drinking Water Guidelines (2011) November 2016 update
- AS/NZS 5132:2017 Waters – Examination for *Legionella* spp. including *Legionella pneumophila* – Using concentration
- NSW Health PD2015_008 Water – Requirements for the Provision of Cold and Heated Water 2015
- Guidelines for the Control of Legionella in Manufactured Water Systems in South Australia 2013

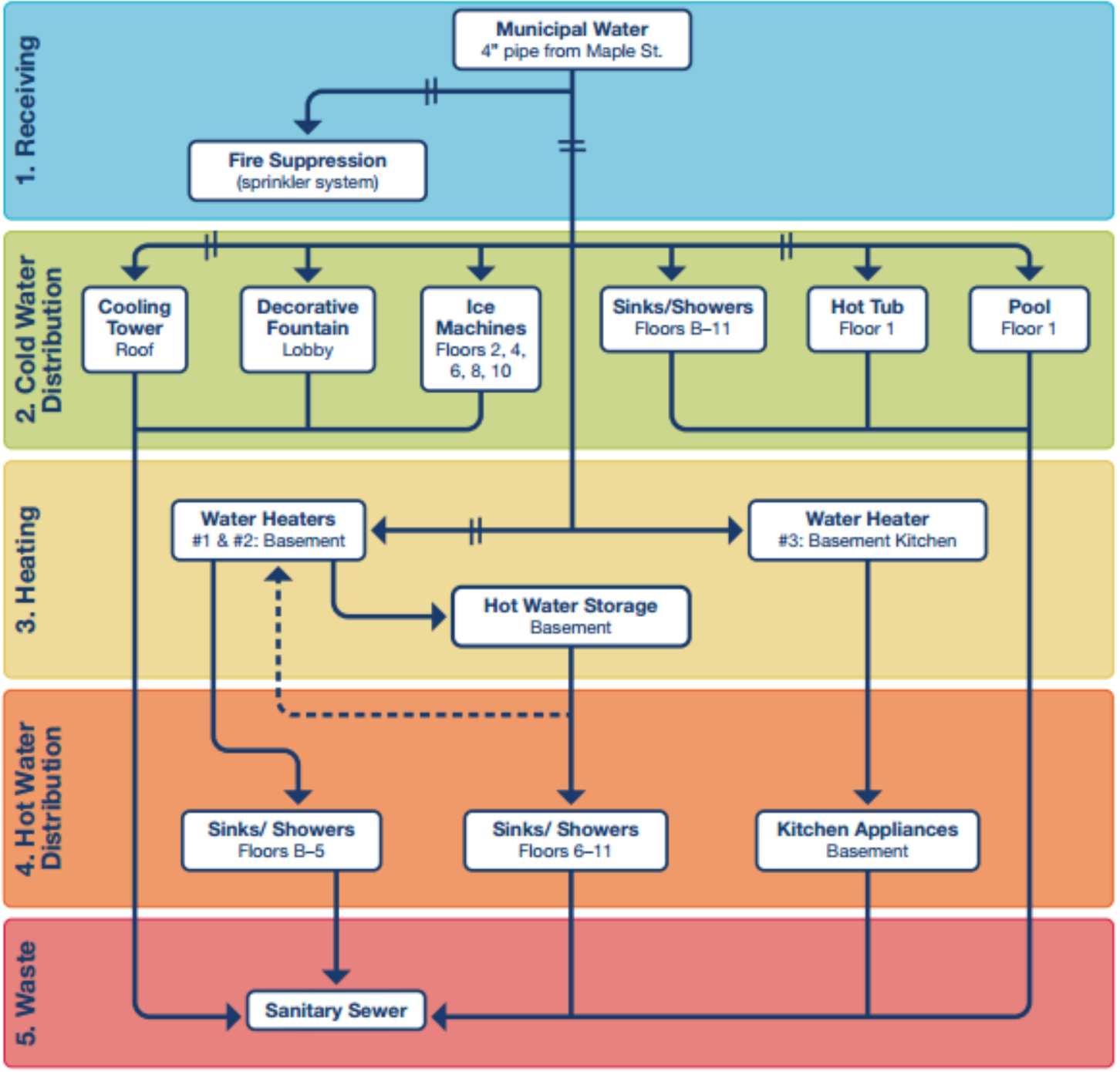
2.1 Hospital and Water System description

- Define which buildings included (QEII site vs SCGH)
- Uses of water
- Users of water – beds, types of patients, HDUs/ICUs, dialysis (RO), dental, transplant, neonates etc.
- Risk allocation to wards/areas

2.1.3

- Incoming water – where, quality (Water Corporation)
  - All potable or some bore in the grounds
- Schematic diagrams of water distribution system……




1. Receiving
Municipal Water
4" pipe from Maple St.
Fire Suppression
(sprinkler system)
2. Cold Water Distribution
Cooling Tower
Roof
Decorative Fountain
Lobby
Ice Machines
Floors 2, 4, 6, 8, 10
Sinks/Showers
Floors B–11
Hot Tub
Floor 1
Pool
Floor 1
3. Heating
Water Heaters
#1 & #2: Basement
Water Heater
#3: Basement Kitchen
Hot Water Storage
Basement
4. Hot Water Distribution
Sinks/ Showers
Floors B–5
Sinks/ Showers
Floors 6–11
Kitchen Appliances
Basement
5. Waste
Sanitary Sewer
Legend:
Backflow Preventer
WaterFlow
Recirculating Return Flow
Water Process

Hospital water distribution system

- Complicated
- Need time to trace – who was going to:
  - Count all the hand basins,
  - Find all drink dispensers,
  - Survey the unused/infrequently used showers,
  - Find all the TMVs and dead-legs…
- Rely heavily on engineering/facilities management (who are already stretched)
- Allocation of resources (human and budgetary), executive support
- External contractor (tender process)

Many interventions can start while the RMP is being developed

- Address major issues immediately – prioritise
  - Remove all aerators
  - OSH risk from splashing
  - Replace with another device
  - Research, costings, practicalities
  - Replacement programme with antibacterial laminar flow devices
  - Require written documentation

Many interventions can start while the RMP is being developed

- Infrequently used/unused outlets flushing programme/document the procedure
- Showerhead/hose replacement programme
- Filter replacement programme for ice machines and drinking fountains
- Priority based TMV replacement programme – device change, re-locate for future accessibility, AS for maintenance
- Start removing dead-legs….
- Require written documentation

Many interventions can start while the RMP is being developed

- Start on Section 4: Responding to detections or cases
  - Refer and update your current procedures
  - We would be the group to provide advice to the Legionella Incident Command group
  - Lots of people would need to be advised in a risk-proportionate manner
    - Public Health/WA DOH, clinicians, current/recent past patients, media/communication plan
  - Laboratory engagement – isolates stored for strain-typing – CALL EARLY (PW stores all hospital potable water *L.pneumophila*)
  - AS/NZS 3666.3 and QLD CHRISP Guideline for Patient Management if Legionella is Detected in Water Supply 2013.
  - WA Health Integrated Corporate and Clinical Risk Analysis Tool

Managing Microbial Quality

HIGH Clinical Risk Locations

Queensland Government

Sampling should be performed according to frequencies discussed in Appendix D. The table at the top of this page helps determine risk ratings for your facility's water system (hot, warm, and cold) HIGH clinical risk locations. Samples collected in order to properly use this table include disinfectant residual, HPC bacteria, and Legionella. First, find the box at the left of the table which best reflects the results obtained. Next, assign that location with the Risk Threat Level from the next box to the right and follow the clinical response indicated, and note the Operations / Engineering Response at the far right. The flowchart at the bottom of this page can be used by moving vertically downward the appropriate 'Response' path and performing the actions described.

Sampling Results	Risk Threat Level	Clinical Response	Operations / Engineering Response
Cl_2 Cold Water ≥ 0.5 mg/L or Hot Water ≥ 0.2 mg/L **AND** HPC ≤ 500 cfu/mL **AND** TLg LP No positive samples (LP & TLg both not detected)	**SYSTEM NORMAL**	None	Refer to System Normal Actions Flowchart below
Cl_2 Cold Water < 0.5 mg/L or Hot Water < 0.2 mg/L **AND** HPC > 500 cfu/mL **AND** TLg LP No positive samples (LP & TLg both not detected)	**MEDIUM RISK**	Yes. Advise local Public Health Unit or Private Health Regulation Team, as appropriate. Refer to CHRISP* document.	Refer to Medium Risk Actions Flowchart below
TLg Any Positive Sample Result **OR** LP Any Positive Sample Result	**VERY HIGH RISK**	Yes. Advise local Public Health Unit or Private Health Regulation Team, as appropriate. Refer to CHRISP* document.	Refer to Very High Risk Actions Flowchart below

Cl_2 CHLORINE RESIDUAL TLg TOTAL LEGIONELLA LP *L.pneumophila* HPC HPC BACTERIA

Legionella RMP is a living document

- RMP needs considerable review while it is being developed
  - New information, make changes, outbreaks in international literature (e.g. HCUs)
  - Chlorine testing, microbiological sampling results
  - Plumbing discoveries, chlorine issues
  - Baseline, targeted microbiological sampling will assist with determining what your future microbiological verification programme will be

LEGIONELLOSIS - USA (17): (WASHINGTON) NOSOCOMIAL, FATAL, ANOTHER CASE
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Date: Tue 27 Sep 2016
Source: Becker's Infection Control & Clinical Quality [edited]
<http://www.beckershospitalreview.com/quality/uw-medical-center-s-legionnaires-outbreak-continues-5th-patient-infected.html>

A 5th patient at University of Washington [UW] Medical Center in Seattle has contracted a _Legionella_ bacterial infection, days after the hospital said its legionnaires' disease outbreak had likely been contained. The newly diagnosed patient had been hospitalized twice in the medical center's Cascade Tower where the outbreak occurred. After an investigation, officials now believe the patient contracted the infection either in the community or during the hospitalization earlier in September [2016], before the hospital instituted water restrictions.

UW Medical Center instituted water precautions [13 Sep 2016] and performed hyper-chlorination of the tower's water system [20 Sep 2016] to eradicate the bacteria from the system after 4 patients contracted legionnaires' disease. An investigation had revealed _Legionella_ bacteria were dwelling in sinks, ice machines, and operating room devices [3 heater cooler units] in the hospital's Cascade Tower.

What to expect?

- New Hospital Guidelines are coming to WA
  - When?
  - What format will they take (enHealth)?
  - What new regulations/requirements might the WA DOH introduce?
- New AS

My summary thoughts

- Perspective – how many nosocomially acquired *Legionella* cases have you *ever* had (vs how many SABSIs, medication errors….)
- Do water management in the right order:
  - Make a risk management plan
  - *Before* you test
  - …..*Before* you get a case (however unlikely)….
- Executive support
- Create an engaged team
- Obtain external help if you need it
- Just get started

Thankyou

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