



T-safe Talks

Paul McDermott

Emerging Risks from Legionella in Universities Post Lockdown



Welcome to T-safe Talks

In this edition of T-safe Talks, we explore the heightened risk from Legionella bacteria post lockdown in the University sector with Paul McDermott, independent consultant, and Authorising Engineer (AE). Interviewed by our own Nick Barsby, National Sales Manager for T-safe and Legionella Control Association Vice Chair, the pair discuss the unique challenges and the implications around water safety that University estates now face in the wake of the COVID pandemic.

The purpose of this document is to inform users as to the precautions for the implementation of effective cleaning and disinfection of T-safe Medical Water Filters where professional hygiene processes are in place.

Meet the Interview Panel

Paul McDermott, PhD of PJM-HS Consulting

Paul has enjoyed a long and distinguished career in the field of water safety, as both a regulator and independent consultant. Having fulfilled roles on 'both sides of the fence', Paul has a unique insight and perspective of the complexities that Responsible Persons and Duty Holders face in respect to Legionella management.

Having spent the first 11 years of his career in microbiology research and as a university lecturer, Paul knows and understands the Higher Education sector. Post academia Paul became a Specialist Inspector in the Health and Safety Executives Biological Agents Unit. Since becoming an independent consultant in 2014 Paul has been appointed as the Authorising Engineer (AE) (Water) at various NHS Trusts and works closely with several Universities in the capacity of specialist water safety advisor.



He has also been instrumental in the production of key national guidance documents in this field and represented HSE at numerous governmental and industry-led forums and conferences, both nationally and internationally.

Nick Barsby, WMSoc of T-safe UK Ltd

Nick Barsby, National Sales Manager of T-safe UK Ltd

Nick has over 15 years' experience in Legionella control. Having worked for some of the UK's leading testing laboratories as a BDM, Sales Manager and Commercial Manager Nick has a vast knowledge of analytical test methods and procedures. Nick is currently National Sales Manager for T-safe and heads up our water hygiene service provider partner initiative.

Playing a pivotal role in the introduction of MALDI-ToF confirmations in the UK market, Nick has a proud track record of innovation and driving positive changes in every organisation he has worked with.



Nick is the Vice Chairman of the LCA and was heavily involved in the re-writing of the Service Standards, he also presented and chaired the webinar series introducing these standards to LCA members. Having written and co-written numerous published articles on a range of subjects covering Microbiology and Laboratory methods, Nick is a well-known and respected individual within the sector.

Q1 What is the Legionella Guidance and Legislation for Universities?

There is an evident Legionella risk in university estates. The Approved Code of Practice for Legionella (ACoP L8) is the bible for Legionella control and management. Its powers are derived from the Health and Safety at Work Act (1974) and Control of Substances Hazardous to Health (COSHH) (2002). The Guidance for compliance comes from Health & Safety Guidance 274 (HSG 274) and this comes in 3 parts:

[HSG 274 Part 1](#) – The control of legionella bacteria in evaporative cooling systems

[HSG 274 Part 2](#) – The control of legionella bacteria in hot & cold water systems

[HSG 274 Part 3](#) – The control of legionella bacteria in other risk systems

By following the guidance set out in ACoP L8 and the relevant parts of HSG 274, compliance can be achieved and demonstrated. The first step is to have a Legionella Risk Assessment and develop a Written Scheme of Control for your water systems.

In my previous role at the HSE I was involved in an investigation into an infection and fatality caused by Legionellosis within a Higher Education setting. This makes the matter of maintaining safe water system in universities, one that is close to my heart.

Q2 What is the Nature of the Legionella Risk in Higher Education settings?

University campuses are vast estates with different types of buildings, ranging from student accommodation to science laboratories to sports centres. This diversity can make them as complex as a hospital in terms of water system infrastructure. This can pose numerous challenges and risks that require mitigating.

A prime example is the challenge around fluctuating occupancy rates, even pre-COVID. Student accommodation for example, often has en-suite rooms with facilities being used at varying levels. When students are away between semesters the accommodation often has overseas students remaining and using the systems however, the water turnover is significantly reduced when compared to the full occupancy levels. The occupancy fluctuations have implications across the campus, not just in accommodation blocks.

A further consideration is the addition of “test” assets to a water system by academics. This may be done to test new technology and may require a constant flow of water to function. It’s not uncommon for these to be plumbed into the main water system with no legionella risk assessment or consideration for the impact on the wider water systems. That’s not to say it’s done maliciously, its often an oversight and not the primary driver of the user to consider legionella risk.

If you are a Higher Education Estates team, as in Healthcare, you tend to be responsible for Legionella control and compliance. How do you manage these unique challenges?

Q3 **What impact has lockdown had on the legionella risk in Higher Education?**

The risk is very likely to have increased through no fault of your own. The lockdown was a truly unique event. People were sent home from work with very little notice and little to no shutdown planning or implementation being achieved. It wasn't just Universities that had this issue, it was across most industries in the UK. These left buildings sitting with stagnant water for a prolonged period of time.

ACoP L8 paragraph 63(b) highlighted that shutdown procedures should have been part of the Written Scheme of Control. Lockdown was an unforeseen event and processes, and procedures were not followed or in some cases didn't even exist. The big questions to ask yourself is:

- Was the Written Scheme of Control followed?
- If not, did you monitor and record your Control Measures?

Q4 **How can Universities prepare and mitigate the risk from legionella?**

Legionella control is not complex. If you remove all dead legs from your system, keep your hot water hot (above 50°C), your cold-water cold (below 20°C) and keep it moving then it's difficult for legionella bacteria to proliferate in your system. If your Legionella Risk Assessment is up to date with a good Written Scheme of Control and its being adhered to and good records are being kept, then you can have confidence.

The challenge for Universities, even before lockdown, was fluctuations in use. When all the students are in a building or campus the water usage is very different to the summer months with reduced occupancy and usage. To mitigate this change in usage its common for "flushing" to be employed. This is where taps are turned on to simulate "normal" use.

During lockdown flushing was a common control measure applied by Estates teams & Water Hygiene companies alike. Records of this should have been kept evidencing the activity. This should have been done with regular temperature checks to evidence that the water systems were maintained in the safe zones for hot (>50°C) and cold (<20°C) water. During the early part of lockdown flushing was not always possible and latterly the impact of the "pingdemic" has caused staffing issues for both Estates and Water Hygiene companies post lockdown, this may have impacted on flushing activity, it's important to check you records and evidence. Do your records show continued compliance?

Q5 **What if I lost control or didn't keep records of flushing and temperature checks?**

If control was lost, at any point, then you must concede that the opportunity for legionella proliferation occurred. It would be prudent and right to take a range of samples to see if you have live legionella bacteria in your system. The results from these samples will decide your next steps.

If you failed to keep records or have poor or insufficient evidence of compliance, then again there is an argument to do some confidence sampling to demonstrate that legionella is not in your system. Again, the results of this will drive your next steps.

There was some guidance on [sample planning and positive results](#) from the Legionella Control Association (LCA) that is handy if you need some help in designing your sampling plan. There are some key points to pick out from this article and they are:

- Sampling should be from the points where you would be more likely to expect legionella
- The strain of legionella is not important, the guidance does not differentiate between *L. pneumophila* or any other species.
- Have a sampling plan, random sampling is not a plan
- It's prudent to take some samples (not all) from areas you don't expect legionella growth to confirm your control measures have been successful.

With students now looking to return we need to review what has been done post lockdown to assess if our control measures have been maintained and can be evidenced. If we cannot evidence the control measures were consistently implemented, then we need to take Legionella samples to evidence that the system is not a legionella risk. Do your records suggest samples need to be taken?

Q6 Do I need to take water samples?

I think it's fair to say that sometimes in the UK we may over sample. That's not the case when the risk level has increased though. When the risk increases or control is lost, either through under use or loss of temperature control, then we need to ensure that there is no legionella in the system. It's prudent to "test the water" if you excuse the pun. This will give you an overview of the state of the system and where control is being achieved or may have been lost.

Again, it's important to remember that we are not looking to sample at our strongest points other than to demonstrate control, we should be testing our system at its weakest points and making sure that the far flung outlets are legionella free.

Q7 I have positives, why? We flushed and carried out a disinfection

Flushing, pre-lockdown, is designed to simulate "normal" use in little used outlets. If the entire building was under-utilised, as per lockdown, then flushing alone can only do so much. It seems unlikely that flushing will replicate "normal" use. If you managed to maintain a strong flushing regime you are unlikely to have simulated normal use, you would need to be able to demonstrate this via Water Meter readings or the like.

If your water use was less than "normal" then you will need to review your Risk Assessment as you failed to achieve the control of turning the water over in the system. It may be prudent to sample, and we should be testing our system at its weakest points to see if we have failures (legionella positives). Your laboratory tests may show that despite losing control in flushing regime you have no legionella growth. It may show low levels or very high counts.

If you have undertaken a disinfection then you will have done so for a reason, normally to remove legionella and biofilm from your pipework. What we need to remember is that any biofilm that has been sheared from the pipework will need to be flushed out of the system and this could, for a short period of time, give you higher risk of legionella as the biofilm and bacteria that occupied it are flushed from the system.

Q8 What does the guidance and HSE expect of me if I have positive legionella results?

It's not just positive results. If the conditions are right for legionella growth and you have returned a set of negative results you are still committing an offence by allowing the conditions to be right for legionella growth. You need to mitigate that risk until control can be restored.

If you have a set of positive results then you need to act, document what action you take and ensure you have evidence and checks in place. Every action should have an expected outcome and response. So, if you undertake a shock disinfection, for example, then you should have plans to re-sample to check the effectiveness of the task and monitor the system periodically post disinfection to ensure on-going compliance. You will have a set of records and evidence to show what you did and what actions followed should you end up in court.

The As Low As Reasonably Practical (ALRAP) or So Far As Reasonably Practical (SFARP) approach should guide your decisions. Is it practical to turn the water supply off to a block of student accommodation in fresher's week; probably not. So, what else can we do to manage and mitigate the risk?

Q9 How can I manage the risk from positive results now that buildings are occupied?

If control has been lost, you've had positive results, or you have any other reason to suspect your system is not legionella free then you need to act. Using the ALARP / SFARP principal we need to take steps to protect the users of our water systems. We can try to flush the bacteria out or add some chemicals but none of these are 'silver bullets' to remove the issue. They will also take time to take effect. For the period between a series of flushes or disinfections there will be a period of time where we don't know if the actions, we have taken have been effective. In these times we can look to secondary control measures for a short-term additional level of risk mitigation.

We then also need to understand our Water Safety Plan, if one exists. How many negative sample results, post a positive, is sufficient for us to accept that control has been restored. Is it three clears, two or just one?

We need to understand our aims and goals before implementing any secondary controls.

Q10 What other strategies can I use?

Point of Use (PoU) filters are a commonly used in Healthcare settings and are listed in HSG 274 Part 2 paragraph 2.117 as a suitable supplementary control measure. They act by stopping all waterborne pathogens at the point of use and give Estates teams time to engineer a solution while keeping end users safe.

When you have positive results PoU filters offer a quick, short-term solution to protect the end users from the risk. This gives you time to investigate the root cause and undertake remedial actions. It's important to know the triggers for removing a PoU filter before installing one, otherwise they stay on systems forever and nobody can explain why.

It's important to choose a filter that provides sterilising grade filtration: this can be checked by asking for evidence of ASTM F838 testing accreditation, filters should also have evidence of microbiological retention efficacy through validation in the field and be WRAS approved.

Other factors to consider include the filter life cycle, the impact on activity space when installed on taps, the ability to track and manage installed filters, along with how they will interact with the assets you have on site, such as compatibility with Panel Showers or Sensor Taps.

In a hospital you have to make sure patients are safe, so the key to this and the lessons to be shared with Universities are about being prepared to deploy PoU filters at short notice, if the risk dictates they must be installed.

Nobody wants to think you will have a series of positive legionella results or lose control of your system, but it could have happened during lockdown. Now it's about being prepared that you may need to implement filters and other supplementary controls as part of your re-opening programme post lockdown. Have a look at suppliers, look who offers what type of products and what you would demand from a supplier. Consider adding them as an approved supplier in preparation or knowing who your Water Hygiene company use for PoU filters. Ask them to come and help identify how they will work with you to manage your higher risk areas and ultimately help you mitigate the risk that legionella can pose.

— Conclusion and Paul's final thoughts

In Higher Education, Legionella is the water borne pathogen of greatest significance. The key is management and communication.

I am an advocate of Universities implementing Water Safety Plans and Water Safety Groups; these are used with great success in Healthcare. These forums allow for improved communications between all parties who represent the different elements of campus life that can have an impact on Legionella risk, such as:

- Academics – those who do or may use and interact with the water systems
- Estates – the teams doing the maintenance
- Contracts – some of whom may well be undertaking plumbing works on your behalf
- Soft FM – those who clean and manage the assets daily
- Accommodation – building managers and teams that know their buildings and usage.

There may be more people you need to consider, look across your estate and decide who can have an influence on water safety and get their buy in. Ask what they are currently doing and who they engage with when taking action. From this you can look to develop duties to safely deliver water across the estate. Share the plan and give authority to the team for their own parts. This will increase communication, understanding and awareness of the water safety requirements and, in my experience this ownership and awareness has driven increased compliance.





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