

# The Water Safety Plan Applied for the Control of Legionella Infections in an Italian Hospital

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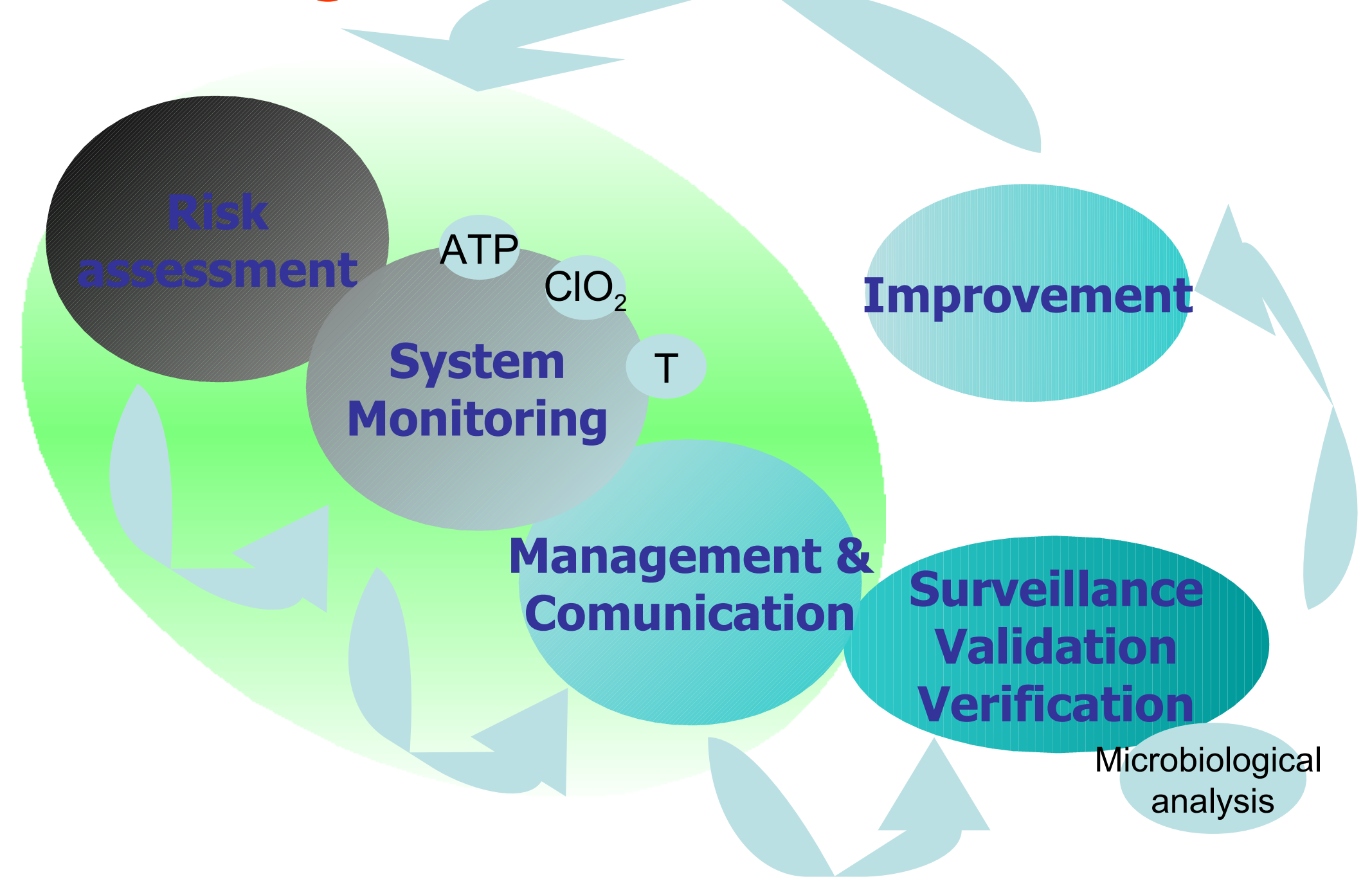
## Background

The San Gerardo University Hospital in Monza is an advance hospital structure, which includes also the Faculty of Medicine of the University Milano Bicocca and comprises different sub-structures located north of Milan in the new province of Monza.

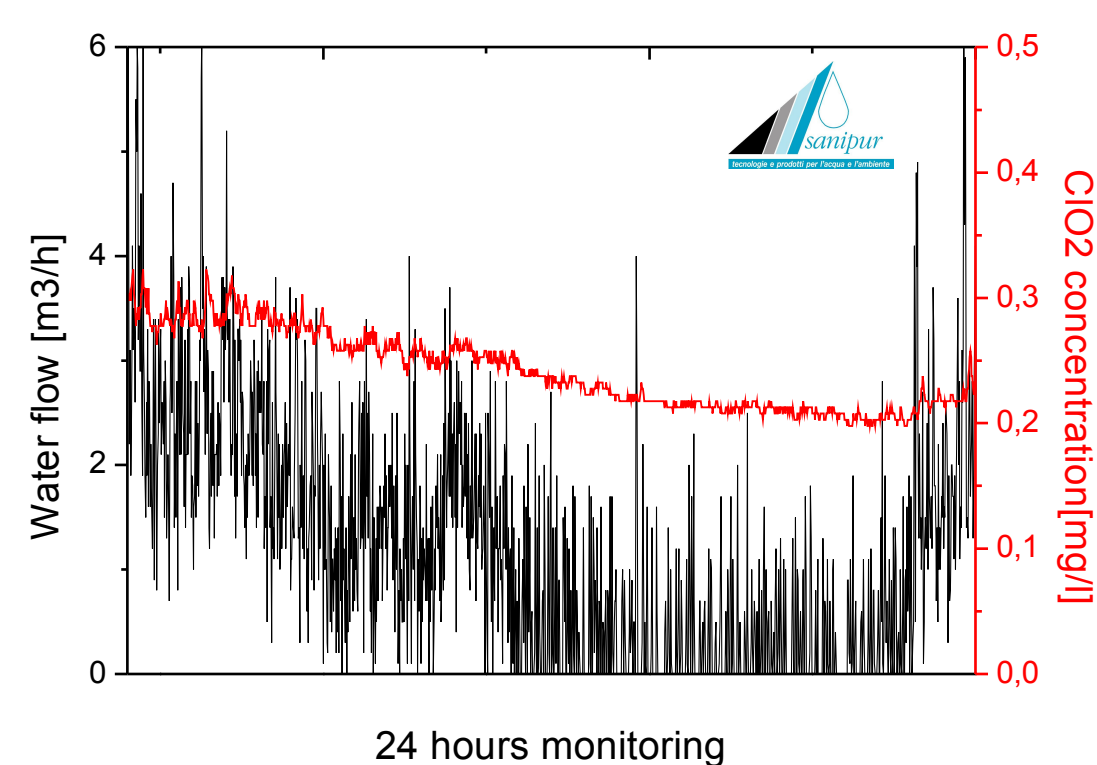
Since 2002 Hospital San Gerardo possessed a **Legionella Surveillance Program** and it is provided with a **continuous disinfection system** for the sanitary hot water. Dosed disinfectant is **chlorine dioxide**. **No nosocomial cases** recorded after implementation of the disinfection systems.

These results has been obtained thanks to the Sanipur ClO<sub>2</sub> **SaniSweep Technology**.

## WSP-based Legionella Prevention Plan



## Sanipur SaniSweep Technology



Sanipur developed a new technology for the eradication of Legionella from the water systems based on a special dosing of the disinfectant (different from the usual systems for potable water). This technology allows a safe and reliable distribution of ClO<sub>2</sub> in piped water systems. ClO<sub>2</sub> is controlled and distributed at a constant concentration (in the optimal range) independently from the water consumption rate (also overnight when no water is consumed). This system has been proved to be effective in removing Legionella in over 150 Italian hospitals.

## Culture test results

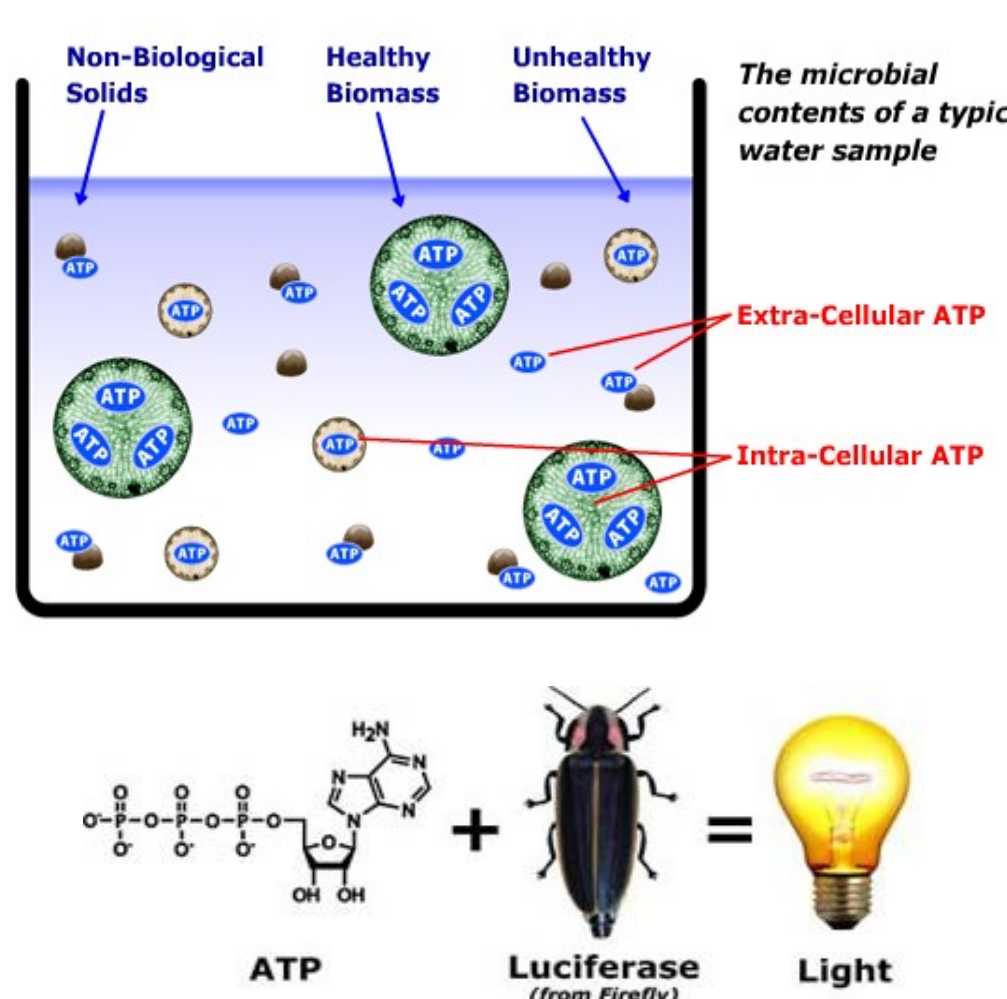
Sampling points	2006												2007												2008												2009									
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	
Rehabilitation																																														
Pediatrics																																														
Urology																																														
Geriatrics																																														
Intensive Care Unite																																														
Attendants Changing room																																														
Hot water tank																																														
Furthest outlet																																														
cooling tower 1																																														
cooling tower 2																																														
cooling tower 3																																														

Legend: closed/shut down (grey), < 100 CFU/L (blue), 100 - 1,000 CFU/L (yellow), 1,000-10,000 CFU/L (orange), > 10,000 CFU/L (red).  
 1 L.P. Serogroup 1, 2 L.P. Serogroup 2-14.

Wards closed for summer stop → dead legs because of water stagnation  
 Disinfection prior to re-opening → no residual contamination

Rarely used → outlet disinfection and purge program improved  
 Contamination because of stop-and-go use. CT's have been shut down and disinfected  
 Slight contamination → immediately resolved by purge and disinfection

## Bioluminescence (ATP) Results



Intracellular ATP is a direct indicator of the level of microbial activity. The evolution of the Total Active Biomass has to be considered as a prime alert of an ecosystem change. Biomass Survey Process = first defense line of a WSP-type strategy.



Slight microbial contamination → control of preventive actions. No Legionella found.

good control	< 0,3
preventive action (PA) required	0,3 - 10
corrective action (CA) required	> 10

Sampling points	2009								
	1	2	3	4	5	6	7	8	9
Rehabilitation									
Pediatrics									
Urology									
Geriatrics									
Intensive Care Unite									
Attendants Changing rooms									
Hot water tank									
Furthest outlet									
cooling tower 1									
cooling tower 2									
cooling tower 3									

Microbial contamination but no Legionella → control of water treatments. No Legionella found.

## Conclusions

It can be seen that WSP-based Legionella Prevention Plan works well. Moreover, thanks to the special disinfection system, water is safe in the whole hospital and Legionella is rarely detected. When positive results were recorded, values were always far below 10,000 cfu/l.

