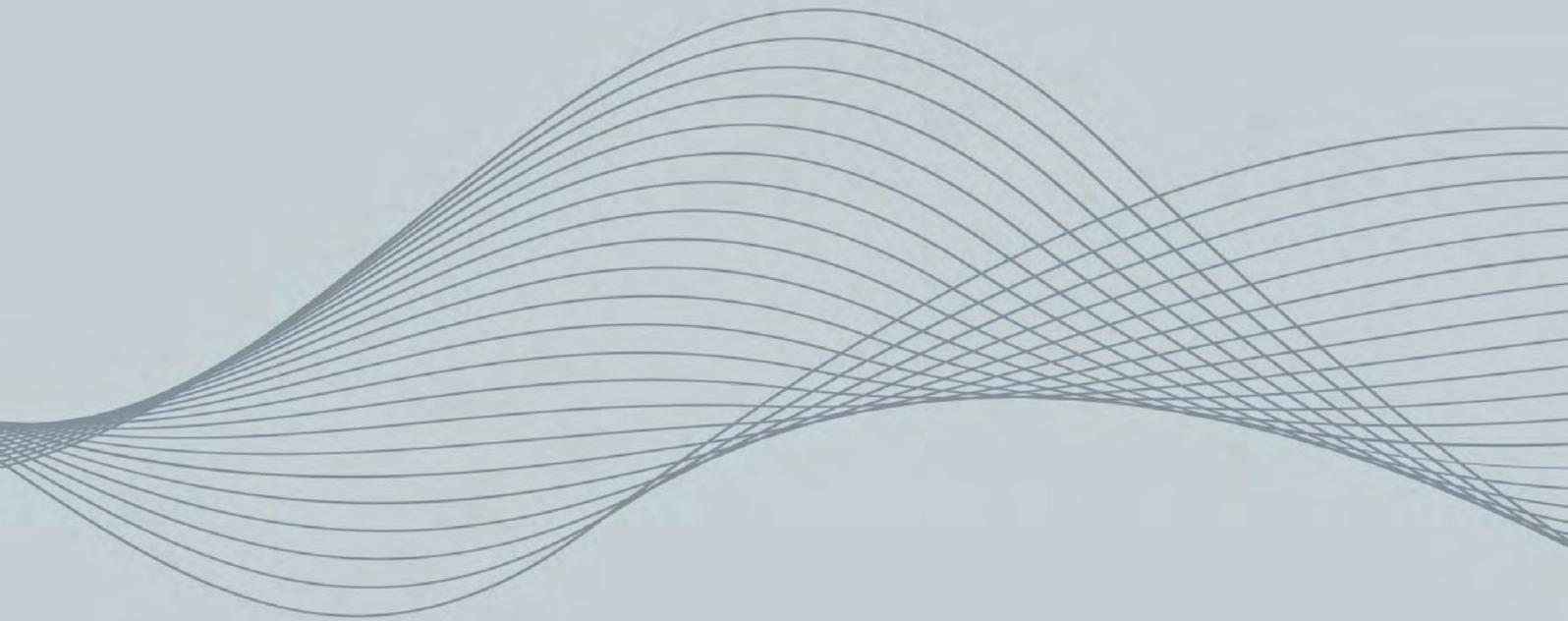# Successful elimination of multi-resistant germs

through the application of biofrequency currents with the sanza frequency package # 10

Successful elimination of multi-resistant germs

through the application of biofrequency current with sanza frequency package # 10

Compilation of information

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Contents

Imprint

Introduction

The fact that multi-resistant pathogens (MRPs) pose a major risk of severe to fatal courses of otherwise insignificant infections is receiving increasing media attention and causing uncertainty.

Although the immune system of healthy people can usually prevent illness when infected with MRPs, these individuals can still be unwitting carriers of these pathogens.

This poses a particular risk for older people and those with weakened immune systems, as the illnesses triggered in them, e.g. pneumonia, wound and urinary tract infections or blood poisoning, are difficult to treat with medication [1].

A diagnosis of infection with MRE also has significant consequences for handling and care. The necessary isolation places a strain on patients, staff and facilities.

This is why a field report on the use of sanza for MRE shows additional treatment alternatives with the result of successful elimination of these germs through the use of frequency package # 10.

General information on multi-resistant pathogens

In order to illustrate the significance of the findings in this field report, it is important to provide general information about multi-resistant pathogens, their occurrence and consequences for infected persons and contact persons.

What are multi-resistant pathogens?

For a better understanding, the term "multiresistant pathogens" must first be explained in more detail.

Resistance refers to the insensitivity of a pathogen to a medicinal active ingredient. If pathogens are insensitive to medicinal active ingredients of different classes (e.g. antibiotics or virostatic agents), this is referred to as multi-resistance.

Multiresistant pathogens can be bacteria, viruses or fungi [2].

Number of infections with MRE in Germany

The significance of the problem of MRSA infections is highlighted by the frequency of these infections and the areas that are particularly at risk.

In medical facilities, i.e. hospitals and nursing homes, the occurrence of resistant pathogens is more likely than outside these facilities, as sick and weak people are cared for here.

Studies by the European Centre for Disease Prevention and Control (ECDC) [3] show that approximately 75 per cent of diseases caused by antibiotic-resistant germs were detected in healthcare facilities.

In addition, patients with immunosuppression or compromised skin (e.g. surgical wounds or indwelling catheters) are at increased risk of pathogen invasion (regardless of whether the pathogens are resistant or not).

According to a study published in the journal Eurosurveillance (46/2019) by the Robert Koch Institute in collaboration with the European Centre for Disease Prevention and Control and the National Reference Centre for the Surveillance of Nosocomial Infections at Charité Universitätsmedizin Berlin, between 400,000 and 600,000 people in Germany contract hospital-acquired (nosocomial) infections each year, resulting in between 10,000 and 20,000 deaths [4].

The use of antibiotics in these facilities creates selection pressure on bacteria. This means that resistant strains can survive and multiply. This increases the risk of multi-resistant germs.

According to an estimate by the RKI, approximately 6% of these nosocomial infections are caused by multi-resistant pathogens (MRPs) [5].

The following table shows the number of infections with the five most important multi-resistant pathogens, based on an average of 500,000 nosocomial infections per year [6].

Pathogen	Number	Percentage
Methicillin-resistant Staphylococcus aureus (MRSA)	11,000	2.2
Vancomycin-resistant enterococci (VRE)	4,000	0.8
Multiresistant Escherichia coli	8,000	1.6
Multiresistant Klebsiella pneumoniae	2,000	0.4
Multiresistant Pseudomonas aeruginosa	4,000	0.8
Total	**29,000**	**5.8**

When other types of pathogens are included, MREs cause as many as 30,000 to 35,000 nosocomial infections in Germany [7].
1,500 infections (0.3% of all nosocomial infections) are attributable to multi-resistant pathogens that are resistant to almost all classes of antibiotics [8].

Number of deaths caused by MRE in Germany and Europe

According to data from the European Centre for Disease Prevention and Control (ECDC), approximately 33,000 people die each year in the EU and the European Economic Area as a result of infection with multi-resistant germs.
In Germany, according to studies from 2015, more than 2,300 people died from this, mainly children under one year of age and elderly people over 65 [9].

According to the ECDC, the number of deaths caused by antibiotic-resistant germs has been rising since 2007 [10].

The following table shows a European comparison of infections and deaths related to antibiotic-resistant germs for the year 2015 [11]

In general, a comparison across Europe shows that the situation is better in Scandinavia and more problematic in the countries of southern and south-eastern Europe.

European comparison of infections and deaths

Antibiotic resistance: The number of infections and deaths (median in each case) for 2015 in a European comparison. The data comes from the European Centre for Disease Prevention and Control (ECDC).

	countries	Number of infections (median)	Number of deaths (median)		Countries	Number of infections (median)	Number of deaths (median)
1	**EU/European Economic area**	**671,689**	**33,110**	16	Bulgaria	5,374	280
				17	Netherlands	4,982	206
2	Italy	201,584	10,762	18	Ireland	4,893	219
3	France	124,806	5,543	19	Sweden	4,571	167
4	**Germany**	**54,509**	**2,363**	20	Croatia	4,347	240
5	United Kingdom	52,971	2,172	21	Denmark	3,351	124
6	Spain	41,345	1,899	22	Finland	2,524	90
7	Poland	41,069	2,218	23	Slovenia	2,280	96
8	Romania	25,077	1,470	24	Norway	1,882	69
9	Portugal	24,021	1,158	25	Lithuania	1,828	90
10	Greece	18,472	1,626	26	Cyprus	1,192	66
11	Belgium	12,892	530	27	Latvia	847	44
12	Czechia	10,438	486	28	Malta	608	29
13	Hungary	10,271	543	29	Luxembourg	487	19
14	Slovakia	7,622	379	30	Estonia	365	15
15	Austria	6,634	276	31	Iceland	2	1

Treatment options and dealing with those affected

The treatment of affected individuals to prevent severe progression poses major challenges for medicine due to the limitations in the choice of medication caused by resistance.

An additional important aspect is preventing the spread of infection among people who have contact with those affected.

Therefore, the focus here is on two points: therapy and hygiene measures for infection prevention.

Conventional therapy for MRE

Only a few reserve antibiotics are available for the treatment of these infections. These are antibiotics that are only used when other antibiotics are ineffective [12]. However, this treatment is often difficult and lengthy. In general, strengthening the immune system and observing hygiene measures are important factors in preventing infection or reducing the risk of infection.

Hygiene measures for infection prevention

In addition to the medical treatment of those affected, the focus must also be on protecting others from infection through contact with infected individuals.

In 2005, the Robert Koch Institute issued the following recommendations regarding infection prevention in care homes for MRE (using MRSA as an example)[13].

Orientation overview of measures for dealing with MRSA-positive residents depending on the type and intensity of care (see also Chapter 9)

Type of care Affected persons	Predominantly social	Predominantly nursing
MRSA-positive resident	• **Accommodation:** As in the home environment (see also 9.1.2) • **Hand hygiene:** Hand disinfection before communal activities • **Sanitation:** Not routine; depends on the epidemiological situation and individual risk (see also 9.3)	Special measures are necessary to prevent transmission, including single room accommodation or cohorting (see also 9.1.2) • **Remediation:** Not routine; depends on the epidemiological situation and individual risk (see also 9.3)
Residents a) without risk factors b) With risk factors (see Table 1)	• **Accommodation:** In the rule no restrictions required (see also 9.1.2) • **Accommodation:** Individual determination of measures depending on the risk assessment (see also 9.1.2) • **Hand hygiene:** Hand disinfection before communal activities	• Residents must not be exposed to any risk of transmission or infection. • Special measures for other residents may be necessary in the case of open wounds or skin defects, probes, catheters, tracheostomas (see also 9.1.2)
Staff	• **Hand hygiene:** Hand disinfection after direct contact with MRSA-positive residents and after removing disposable gloves. • **Disposable gloves:** In case of possible contact with material containing pathogens • **Protective clothing:** – Protective gowns/aprons during close nursing contact (e.g. changing beds) – Mouth and nose protection In case of possible contact with infectious aerosols (e.g. during tracheostomy care)	• **Hand hygiene:** Hand disinfection after direct contact with residents, especially before and after specific nursing procedures, e.g. wound care, urinary catheter, PEG tube, tracheostoma, other stomas – Before leaving the room – after removing disposable gloves • **Disposable gloves:** In case of possible contact with pathogen-containing material • **Protective clothing:** – Protective gowns/aprons during close nursing contact (e.g. changing beds) – Mouth and nose protection in case of possible contact with infectious aerosols (e.g. during tracheostomy care)
Visitors	• **Hand hygiene:** Hand washing is usually sufficient	• **Hand hygiene:** Hand disinfection before leaving the room
Environment	• **Surface cleaning/disinfection:** Normal cleaning; targeted disinfection if necessary (see also 9.1.1.2) • Laundry: see section 5.3.3 • Beds: see Table 2 and Chapter 5.3.3 • Dishes: Standard (machine) washing	• **Surface cleaning/disinfection:** – According to cleaning and disinfection plan – Targeted disinfection, if necessary – Disinfection of surfaces with frequent hand/skin contact • Laundry: see Chapter 5.3.3 • Beds: see Table 2 and Section 5.3.3 • Dishes: Standard (machine) washing

For screening, see 9.2; for surveillance, see 9.4, a See also "Hygiene requirements for cleaning and disinfecting surfaces" Commission Recommendation C.2.1 of the Guideline on Hospital Hygiene and Infection Prevention [2].

Additional costs due to infections with MRE

In addition to the increased workload for staff caring for patients infected with MRE, the various institutions also incur additional costs.

A study conducted by the Scientific Institute of the Techniker Krankenkasse (WINEG) in collaboration with researchers from the University of Greifswald to evaluate 11,000 cases of MRE infections among TK insured persons in 2015 showed that each individual MRE infection incurs additional costs of €17,500[14].

According to this evaluation, the average length of stay in hospital in these cases is 27 days, which is three times higher than the regular length of stay. This alone results in additional costs of £16,230. Additional costs of £100 were determined for follow-up outpatient treatment. The additional costs for medication are estimated at £1,187.

Extrapolated to all health insurance companies, this study estimates additional costs of several hundred million euros per year[15].

At the 13th Congress for Hospital Hygiene (DGKH) in April 2016, HICARE Aktionsbündnis gegen multiresistente Bakterien (HICARE Action Alliance against Multiresistant Bacteria) also presented the results of the cost analysis of MRE in nursing homes. Data from a total of 71 MRE cases in six nursing homes in Mecklenburg-Western Pomerania from 2011 to 2013 were evaluated for this purpose.

This resulted in additional costs of €12,675 per case, mainly caused by staff commitment (airlocks and disinfection) and isolation material (protective equipment, disinfectants)[16].

Practical investigation of the success of using sanza with biofrequency package #10 for MRE

This background of germs that cannot be treated in hospital prompted the sanza consultant, whose main job is as the manager of a retirement home, a qualified nurse and certified wound expert at ICW e.V. (Initiative for Chronic Wounds in Germany e.V.), Mr André Heichel, to investigate the effect of treatment with biofrequency package #10 on affected individuals in his facility.

Sanza combines three applications in one device as a complementary system: pulsating magnetic fields with patented envelope signals, biofrequency current and biolaser[17].

General information on the biofrequency current application of sanza pro

Biofrequency current with identified resonance frequencies of viruses, bacteria, fungi and worms can repel microbes that have entered the body and thus restore balance to the environment. These pathogens never occur individually but in groups, i.e. together with other types of microbes. The special know-how regarding which groups interact was developed over more than ten years of work with 200,000 human measurements. The results of these measurements can be found in the frequency packages[18].

When biofrequency current is applied with sanza, the pathogens are paralysed, prevented from reproducing and extremely weakened. This makes them vulnerable to the immune system.

Specific information about frequency package #10

Frequency package #10 combines 41 frequencies, which have been tested extensively and proven effective, for the following multi-resistant germs:

Bortedella pertussis, Enterococcus, Enterobacter aerogene, Camphylobacter, Haemophylus influ., Helicobacter pyl., Klebsiella pneum., Neisseria gonorrhoeae, Pseudomonas aeroginosa, Proteus mirabilis, Proteus vulgaris, Pneumococcus mix., Pseudomonas, Salmonella enteridit, Salmonella Hyphimuricum, Salmonella Parathyphi, Serratia marcesceus, Shigella sp.dysenteriae, Staphylococcus aureus, Streptococcus Pneumonia, Streptococcus Pyogene, Streptococcus haemolytic, among others.

The frequency package is used both in the prevention of infections and in the targeted treatment of individuals with problems caused by an infection.

Presentation of the practical examination

Due to the long duration of the necessary isolation and the associated consequences for the patient and the care facility, one particular case is described in detail below. Further observations are presented in tabular form.

Case study

A resident of the nursing home was admitted to hospital on 4 June 2018, where a MRSA bacterium was detected in a nose and throat swab.

MRSA is the methicillin-resistant Staphylococcus aureus bacterium. This type of bacterium can develop resistance to the antibiotic methicillin and occurs asymptomatically in approximately 30% of the population, mainly in the nasal vestibule, throat, armpits and groin. It is mainly transmitted through hand contact or touching contaminated surfaces.

If the bacterium enters the body through the mucous membranes or open wounds, it can cause skin and wound infections, respiratory and urinary tract infections, inflammation of organs and tissues, or even sepsis[19].

The subsequent swabs taken on 10 and 14 June 2018 were also MRSA positive.

Successful treatment in hospital was not possible. Therefore, the patient was discharged on 20 June 2018, she was transferred back to the senior citizens' facility.

For reasons of infection control for fellow residents and staff, the following hygiene and isolation measures had to be taken:

• Isolation of the resident in a single room
• Suspension of her participation in communal events
• Suspension of participation in communal meals
• Requirement for visitors to register with the nursing staff in advance
• Care staff only caring for the resident while wearing protective clothing (protective gown, face mask, gloves)

All measures to eliminate the bacteria, such as drug therapy, washing with disinfectant soaps and nasal rinses, were unsuccessful.

Therefore, the isolation status had to be maintained for 223 days, from 20 June 2018 to 28 January 2019.

This long-term isolation had consequences for

- the resident
  - Loneliness and withdrawal
  - Feeling of being an outcast
  - Decline or cessation of social contacts
  - Depressive moods and even depression (requiring additional medication)
- The senior citizens' facility
  - Additional costs without the possibility of financial reimbursement (protective clothing, special disinfectant, time expenditure, additional personnel costs)

Alternative treatment using the sanza biofrequency package # 10

From 8 January 2019, the sanza biofrequency current application with package #10 was used three times a day for 30 minutes.

On 28 January 2019, 20 days after the start of this measure, no evidence of the MRSA pathogen was possible. Three further follow-up tests at intervals of one day were also negative.

Further treatment successes with the sanza BFS Chip # 10

The successes of further cases are listed in the table below.

No.	Gender	Age	Bacterial colonisation	Duration of bacterial colonisation prior to treatment (in months)	Treatment (in minutes)	Duration until sterility (in days)
1	M	72	MRSA in mouth and nose		5 x 30	6
2	M	74	MRSA in mouth and nose		5 x 30	5
3	W	86	MRSA in bladder		3 x 30	10
4	M	87	VRE in mouth and nose		3 x 30	13
5	W	68	MRGN– in bladder		3 x 30	11
6	W	70	MRGN+ in bladder		3 x 30	11
7	W	72	MRSA in bladder		3 x 30	12
8	M	81	MRSA in mouth and nose		3 x 30	9
9	W	92	MRSA in the mouth and nose		5 x 30	6
10	M	73	VRE in mouth and nose		5 x 30	8
11	M	73	MRGN– in bladder		5 x 30	7
12	W	89	MRSA in mouth and nose		5 x 30	5
13	M	60	VRE in mouth and nose	3	5 x 30	6
14	M	78	MRGN – in the throat	1	5 x 30	4

No.	Gender	Age	Germ colonisation	Duration of bacterial colonisation before treatment (in months)	Treatment (in minutes)	Duration until sterility (in days)
15	M	93	ESBL in the genital area	5	3 x 30	8
16	M	85	MRSA in wound	12	5 x 30	9
17	W	72	MRSA in wounds	36	3 x 30	17
18	W	69	ESBL in bladder	24	5 x30	9
19	M	93	MRSA in mouth and nose	11	5 x 30	4
20	W	95	MRGN+ in wound	15	5 x 30	5
21	W	87	MRSA in nose	5	5 x 30	3
22	W	89	MRSA in nose	7	5 x 30	4
23	W	79	MRSA in nose	4	5 x 30	3
24	W	78	MRSA in nose	5	5 x 30	3
25	M	77	MRSA in the nose	8	5 x 30	4
26	M	71	MRSA in bladder	1 day	2 x 30	1
27	W	86	VRE in mouth and nose	2 days	2 x 30	1
28	M	87	ESBL in the genital area	9	5 x 30	6
29	M	86	MRSA in wound	10	3 x 30	8
30	W	82	MRGN– in the throat	4	5 x 30	3
31	W	85	MRGN– in the throat	3	5 x 30	3
32	M	83	MRGN+ in the throat	5	5 x 30	4
33	W	91	MRSA in nose	6	5 x 30	4
34	M	90	VRE in mouth and nose	2	5 x 30	5
35	W	89	MRSA in bladder	7	5 x 30	5
36	M	78	MRSA in mouth and nose	10	5 x 30	4
37	M	71	ESBL in the genital area	5	3 x 30	10
38	M	75	ESBL in bladder	8	5 x 30	7
39	M	79	VRE in the throat	2	5 x 30	3
40	W	80	MRGN+ in mouth and nose	6	5 x 30	4
41	W	82	MRSA in nose	5	5 x 30	4
42	W	88	MRSA in the mouth and nose	2	5 x 30	2
43	M	93	MRSA in wound	9	5 x 30	7
44	M	81	MRGN– in mouth and nose	4	5 x 30	3
45	W	85	VRE in mouth and nose	2	5 x 30	4

No.	Gender	Age	Germ colonisation	Duration of bacterial colonisation before treatment (in months)	Treatment (in minutes)	Duration until sterility (in days)
46	M	78	MRSA in mouth and nose	1	5 x 30	2
47	W	77	MRSA in wound	3	5 x 30	3
48	W	79	MRGN+ in bladder	8	5 x 30	6
49	M	96	ESBL in the bladder	12	4 x 30	4
50	M	83	MRGN+ in the throat	5	5 x 30	4
51	W	77	MRSA in nose	6	5 x 30	4
52	W	70	VRE in mouth and nose	2	5 x 30	5
5	M	80	MRSA in bladder	7	3 x 30	5
54	W	62	MRSA in mouth and nose	4	5 x 30	2
5	M	69	MRSA in mouth and nose	2	3 x 30	2
56	W	71	MRGN– in mouth and nose	6	5 x 30	4
57	M	77	VRE in wound	2	4 x 30	3
58	W	88	MRSA in wound	6	5 x 30	4
59	W	81	MRGN– in throat	4	5 x 30	2
60	M	74	MRSA in mouth and nose	2	5 x 30	2
61	W	93	MRSA in wound	23	5 x 30	7
62	W	79	MRSA in nose	4	5 x 30	3
63	M	82	VRE in mouth and nose	2	5 x 30	3
64	W	79	MRGN+ in the throat	2.5	5 x 30	2
65	M	76	MRSA in wound	4.5	5 x 30	3
6	M	85	ESBL in the bladder	18	5 x 30	6
67	M	66	MRGN – in the throat	1.5	5 x 30	2
68	M	81	VRE in the throat	7	5 x 30	4
69	W	90	MRGN+ in nose	5	5 x 30	4
70	M	90	VRE in mouth and nose	2	5 x 30	3
71	W	83	MRSA in bladder	7	3 x 30	4
72	W	78	MRSA in mouth and nose	8	5 x 30	4
73	M	71	ESBL in bladder	5	3 x 30	10
74	M	75	EHEC	8	5 x 30	7
75	M	76	MRGN+ in the throat	5.5	5 x 30	3
76	M	78	MRGN+ in nose	7.5	5 x 30	4
77	M	81	MRSA in nose	6.5	5 x 30	4

No.	Gender	Age	Germ colonisation	Duration of bacterial colonisation before treatment (in months)	Treatment (in minutes)	Duration until sterility (in days)
78	W	69	MRSA in mouth and nose	1.5	5 x 30	2
79	W	86	MRSA in wound	9	5 x 30	6
80	M	78	MRGN+ in mouth and nose	3.5	5 x 30	3
81	M	84	MRGN– in mouth and nose	2	5 x 30	3
82	W	71	MRSA in the mouth and nose	1	5 x 30	2
83	M	68	MRSA in wound	8.5	5 x 30	3
84	W	77	EHEC	8	5 x 30	6
85	M	71	ESBL in the genital area	6.5	3 x 30	5
86	M	73	EHEC	8	5 x 30	7
87	M	91	MRSA in the throat	2	5 x 30	3
8	M	82	MRSA in mouth and nose	6.5	5 x 30	4
89	W	81	MRSA in wound	5.5	5 x 30	4
90	W	86	MRSA in wound	2	5 x 30	2
91	W	94	MRSA in wound	9	5 x 30	6
92	M	83	MRGN+ in mouth and nose	4	5 x 30	3
93	M	84	MRSA in wound	2	5 x 30	4
94	W	78	MRSA in wound	1	5 x 30	2
95	M	82	MRSA in wound	3	5 x 30	3
96	M	93	MGRN+ in bladder	8	5 x 30	5

EHEC = enterohaemorrhagic Escherichia coli

see MRGN– [20]

ESBL = extended-spectrum beta-lactamase

Bacteria that render antibiotics largely ineffective, normally found in the intestinal flora and excreted in the stool. If hygiene is inadequate, the bacteria can be transmitted via the hands and cause various infections. Urinary tract infections are the most common. [21]

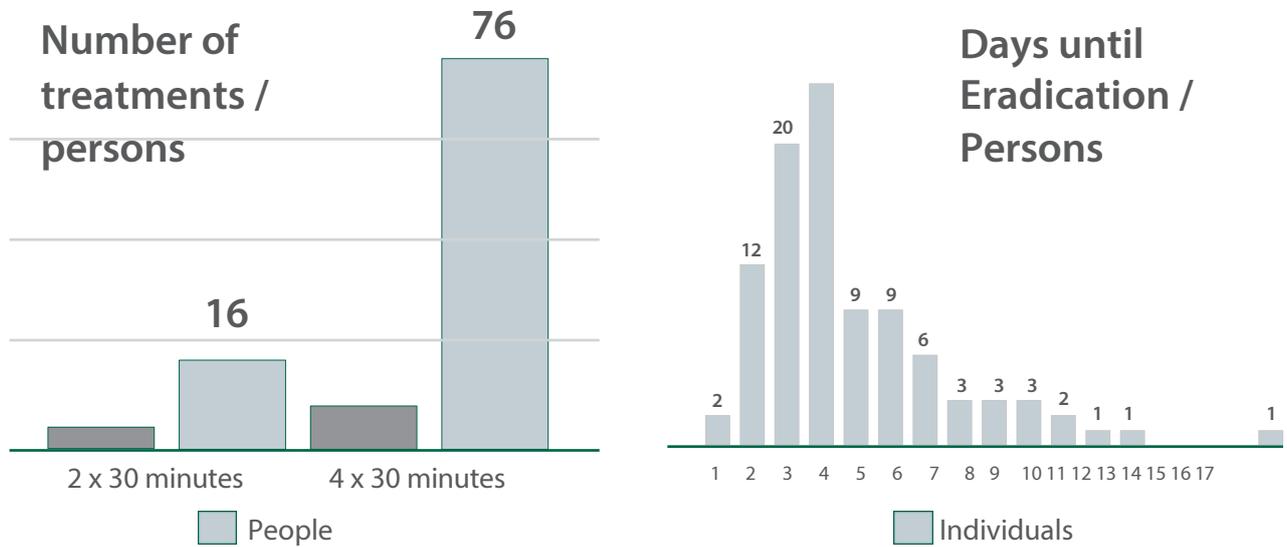**MRGN+ and MRGN– = multidrug-resistant Gram-negative pathogens**

These are rod-shaped bacteria that are resistant to various antibiotics. They can cause wound infections, respiratory and urinary tract infections or sepsis.[22]

VRE = vancomycin-resistant enterococci, Enterococcus faecium

This bacterium is resistant to the antibiotic vancomycin. In immunocompromised individuals, this can cause urinary tract infections, vaginal infections, soft tissue infections, infections of the oral cavity or wound infections. The fact that very few reserve antibiotics are available makes treatment very problematic[23].

Results of the practical investigation

The practical study showed that after a maximum of 17 days (usually significantly less), no MRE colonisation was detectable in any of the 96 patients treated.

Number of treatments / persons

76

16

2 x 30 minutes   4 x 30 minutes

People

Days until Eradication / Persons

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Individuals

This meant that 100% eradication of the bacteria could be achieved quickly and without side effects. This had not been possible with conventional therapy, as illustrated by the documented case.

Furthermore, the observations led to two hypotheses:
H1: The more treatments are carried out per day, the faster the eradication of germs. H2: The shorter the colonisation time by the germ, the faster the eradication of germs.

Scientific evaluation of the results

These results were statistically evaluated by Dr Ronald Burger, a doctor of sports science and methodology expert, and checked for random occurrence.

The aim here was to clarify whether the hypotheses could be confirmed more frequently than would be expected by chance or whether the results were random.

Theoretical approach

The results were evaluated using Pearson's correlation analysis to determine significance and degree of explanation (R^2).

Correlation coefficient

Pearson's correlation coefficient was used to examine the relationship between the number of treatments and the time to germination and the relationship between the colonisation period and the time to germination.

The correlation coefficient provides information about the strength of the relationship between two variables and its direction, and can take values between -1 and 1.

A negative correlation coefficient indicates an inverse relationship between the variables. This means that as the value of one variable increases, the value of the other variable decreases.

Example:

The faster a car drives (the higher the speed), the shorter the time it takes to travel from A to B.

A positive correlation coefficient indicates a positive relationship between the two variables. This means that when one value increases, the other value also increases.

A value of 0 indicates that the two variables are unrelated[24], such as the number of storks and the birth rate.

According to Cohen, the strength of the correlation can be classified as follows[25]:

	0.1				0.5					1
r										
0	− 0.1				− 0.5					− 1

Weak correlation

Moderate correlation

Strong correlation
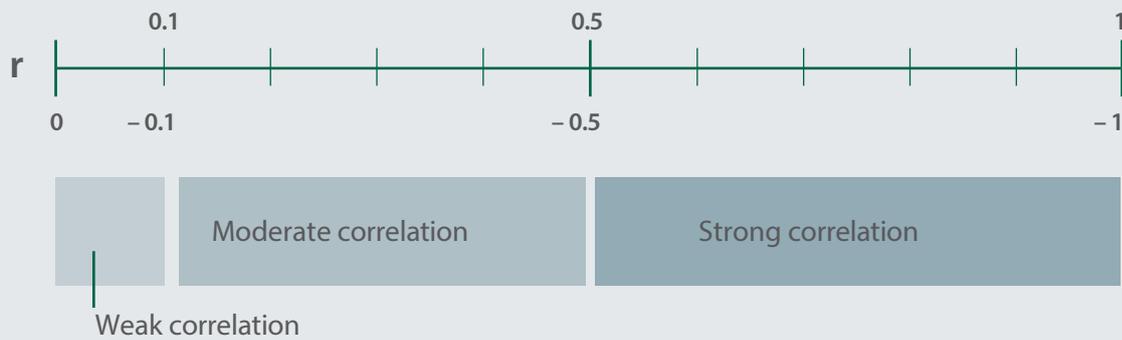
Significance

The significance determines that this correlation between the variables, i.e. in this case hypotheses **H1: The more treatments per day, the faster the germ eradication** and **H2: The shorter the colonisation time, the faster the germ eradication** in the sample, does not occur randomly but applies to the whole. This is calculated after the significance level (= upper limit for the probability of error) has been determined.

A significance level of 5%, i.e. 0.05, is generally accepted. If the hypothesis test yields a value below 0.05, the result is considered significant, i.e. above chance[26].

Coefficient of determination R^2

The coefficient of determination R^2 indicates the proportion of the variance of the dependent variable that is explained by the independent variable(s), i.e. the percentage of the difference in the measured values that can be attributed to the influences examined here[27].

Here, a mathematical check is performed to determine the percentage of the change in the values for the duration until germination eradication that can be explained by the number of treatments or the colonisation duration.

Results of the review of the practical investigation

The calculation of Pearson's correlation coefficient for the number of treatments compared to the time to sterility yielded a negative mean correlation of -0.435. With a hypothesis test result theoretically close to 0.000, the result can be interpreted as highly significant.

For the duration of colonisation compared with the duration until sterility, a strong positive correlation was determined with a correlation coefficient of 0.745. This result is also considered highly significant at a theoretical significance level of close to zero.

With a calculated R^2 value of 60%, it can be assumed that changes in the duration until germ eradication can be explained by changes in the number of treatments or colonisation duration more often than would be expected by chance.

		Age	N Treatment	Days germ-free	Months colonised
Age	Pearson correlation	1	.112	− 0.076	.119
	Significance (two-tailed)		.279	.463	.283
	N (number)	96	96	96	84
N Treatment	Pearson correlation	,112	1	− ,435**	− 0.068
	Significance (two-tailed)	.279		.000	.536
	N (number)	96	96	96	84
Days germ-free	Pearson correlation	− 0.076	− 0.435**	1	.745**
	Significance (two-tailed)	0.463	0.00		.000
	N (number)	96	96	96	84
Months colonised	Pearson correlation	.119	− 0.068	.745**	.119
	Significance (two-tailed)	.283	.536	.000	.283
	N (number)	84	84	84	84

H_1 = the more treatments per day, the faster the eradication!
H_2 = the shorter the colonisation, the faster the eradication! $R^2 = 60\%$

Conclusion

Treatment with the sanza frequency package #10 achieved 100% germ eradication in a short period of time without any side effects.

Dr Burger's calculations prove that there is a statistically significant correlation between the use of the sanza frequency package #10 and germ eradication, which can therefore be generalised.

It can be concluded that the more frequently patients are treated with the sanza frequency package #10, the faster the germ eradication occurs. The second result is also supported by the fact that the shorter the colonisation period, the clearer the results.

The use of frequency package #10 therefore has enormous potential, especially in view of the figures presented.

Thanks to considerable cost savings (due to reduced need for protective clothing, disinfectants, time and personnel), the investment in sanza quickly pays for itself, not to mention further synergy effects from the simultaneous treatment of other problems and infection prevention through the treatment of uninfected contact persons.

In addition, this service is another unique selling point compared to competitors.

But even more valuable and priceless is the positive impact on the lives and well-being of those affected by eliminating germs, increasing well-being, preventing accompanying and secondary illnesses (e.g. depression), enabling a faster return to social life, maintaining social contacts and preventing loneliness.

These successes can also be easily achieved in one's own home, so they do not have to be reserved for people in medical facilities.

Sources

1 Julia Talmann, Helios Hygiene Study Over 2000 deaths per year due to multi-resistant pathogens, published 4 December 2019, https://www.helios-gesundheit.de/kliniken/berlin-buch/unser-haus/aktuelles/detail/news/ueber-2000-tote-pro-jahr-durch-multiresistente-erreger/, accessed on 9 March 2021

2 Dr Frank Antwerpes, Dr Norbert Ostendorf, Multiresistenz (Multiresistance), https://flexikon.doccheck.com/ de/Multiresistenz, accessed on 9 March 2021

3,9,10,11 Anne Bäurle, 33,000 deaths per year due to resistant germs, ÄrzteZeitung online, published 6 November 2018, https://www.aerztezeitung.de/Medizin/33000-Tote-pro-Jahr-durch-resistente-Keime-226155.html, accessed on 9 March 2021

4 New estimate of the burden of disease caused by hospital infections, press release from the Robert Koch Institute, as of 15 November 2019, https://www.rki.de/DE/Content/Service/Presse/Pressemitteilungen/2019/14_2019.html, accessed on 9 March 2021

5,6,7,8 How many hospital infections are caused by multi-resistant pathogens? RKI
- Antibiotic resistance - Answers to frequently asked questions about hospital infections and antibiotic resistance, as of 16 November 2018, https://www.rki.de/SharedDocs/FAQ/Krankenhausinfekti-onen-und-Antibiotikaresistenz/FAQ_Liste.html, accessed on 9 March 2021

12 Michael Ebenhoch, Anka Röhr, Reserve antibiotics targeted against multi-resistance, Pharmazeutische Zeitung online, published 19 January 2020, https://www.pharmazeutische-zeitung.de/ge-zielt-gegen-multiresistenz/, accessed on 9 March 2021

13 Federal Health Gazette – Health Research – Health Protection 2005 – 48: 1061 – 1080 DOI 10.1007/s00103-005-1126-2 Springer Medizin Verlag 2005, Infection Prevention in Care Homes, p. 1075 https://www.rki.de/DE/Content/Infekt/Krankenhaushygiene/Kommission/Downloads/ Heimp_Rili.pdf?__ blob=publicationFile, accessed on 9 March 2021

14,15 TK study Every MRE infection incurs additional costs of €17,500, https://www.aerztezeitung.de/ Politik/Jede-MRE-Infektion-bringt-17500-Euro-Mehrkosten-235307.html, accessed on 4 September 2023

16 Prof. Dr Steffen Fleßda, Dr Claudia Hübner, Analysis of the costs of multi-resistant pathogens in various healthcare facilities (hospitals, rehabilitation centres, nursing homes, doctors' surgeries), https://www.krankenhaushygiene.de/referate/0cdadc7f688ed5dfff57f176788f6492.pdf, accessed on 4 September 2023

17,18 Else Knaf, Santerra Forschungs- und Vertriebs- GmbH, sanza pro practical guide for users, June 2022

19,21,23 https://www.bbraun.de/de/patienten/temp/multiresistente-erreger/haeufig-vorkom-mende-mre.html, 4 September 2023

20 Dr Frank Antwerpes, Natascha van den Höfel, EHEC, https://flexikon.doccheck.com/de/EHEC, accessed on 4 September 2023

20,22 Dr Sabine Messler, Dr Frank Antwerpes, Dr Norbert Ostendorf, Multiresistant Gram-negative pathogens, https://flexikon.doccheck.com/de/Multiresistente_gramnegative_Erreger, accessed on 9 March 2021

22 MRGN – Multiresistant Gram-negative bacteria, Federal Centre for Health Education, 23 April 2018, https://www.infektionsschutz.de/erregersteckbriefe/mrgn/, accessed on 9 March 2021