

DESIGN FOR OPTIMUM INFECTION CONTROL

Complying with HTM 01-05 will involve most dental clinics in some reorganisation, including changing the layout and fittings in their premises. In the first of a series of articles, dentist turned architect Richard Mitzman considers the considerable benefits of taking this opportunity to undertake a more ambitious refurbishment

The prevalence of viruses like HIV and hepatitis, along with drug-resistant 'super bugs' and understandably cautious patients, all emphasise the need for strict cross infection controls, especially in dental clinics where every procedure results in some bleeding. Hence the introduction of HTM 01-05 with which all clinics will have to be compliant. For many clinics, meeting these requirements will mean considerable reorganisation, and so also expense and disruption, and even then might be very difficult for those already cramped for space.

Yet over the last 10 years we've fitted out a string of dental clinics, 27 in all with more coming, that go beyond these standards in eliminating cross infection - and even the

early ones are easily adapted to meet the new 'best practice' layout for decontamination. Organising the layout of clinics according to a specific design approach and using a system of components, both of which we've developed over the years, these clinics eliminate opportunities for cross contamination from all areas. Key features are compact twin surgeries, separate patient and staff circulation routes through the clinic and, more recently, separate dirty and clean decontamination rooms.

EFFICIENT AND PRODUCTIVE

Such fit-outs are not cheap. But beyond eliminating cross infection they increase efficiency and productivity, quickly recouping the investment. The predominantly glass surfaces are immediately 'seen to be clean', ensuring high standards of hygiene and reassuring patients these are met. Moreover, the calm, light-filled spaces, the elimination of patient-staff clashes in movement, the separate consultation rooms and waiting areas

designed and furnished to be of distinctive character, all quickly attract new patients. They are also appreciated by dentists and staff who comment on how much they enjoy the premises and how this further enhances productivity. All these and other benefits are so considerable as to make it worth considering fitting out entirely new premises, especially if cramped space in the present clinic make complying with HTM 01-05 difficult.

PREVENTING CROSS INFECTION

These further benefits of our approach to the layout and fit-out of clinics will be elaborated on in future articles. However, for the remainder of this one the focus is on the control of cross infection, a concern that should influence more than the decontamination of equipment, the subject of HTM 01-05. Cross infection can also occur in the surgery and in the circulation routes through which equipment is carried. That is why we have developed a new type of surgery and a system of 'Steri-Walls' that ideally form the back of each surgery and separate it from the decontamination areas and staff circulation, which is separated from that of the patients.

WORKTOPS

In the surgery, all worktops, as well as the equipment and other clutter on them, are a potential source



Glass surfaces offer high standards of hygiene and reassure patients

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Patients use frosted glass sliding doors from their own corridor, while staff enter the surgery from a rear door (Green Room Dental, Newquay)



Purpose-made glass-topped trolleys provide further worktop space and feature polypropylene drawers with rounded corners for ease of cleaning



Double-sided Steri-Walls are accessible from both the surgery and the staff area behind, so bagged and sterilised equipment can then be loaded directly from the latter ready for use in the surgery to be unwrapped in the presence of the patient (Advance Dental, Chelmsford)



Consultation rooms and waiting areas with distinctive character attract new patients (321 Dental, Finchley)

of cross infection. Before each new patient enters all of this must be thoroughly cleaned. To minimise the time lost between patients we design twin surgeries so that the dentist can go directly from one patient to the next whom a nurse would already have brought to the 'clean' surgery and prepared. When the dentist starts on the new patient, the 'dirty' surgery occupied by the previous patient can be thoroughly cleaned. The considerable economic benefits of this system will be the subject of the third of these articles.

Keeping worktops in the surgery to a minimum clearly minimises both cross infection and cleaning time. The usual U or L configuration of cabinets invite both clutter and 'nesting' (by dentists displaying personal items), which complicates cleaning and makes it awkward for other dentists to use the same surgery. For efficiency and flexibility we reduce worktops to a single glass shelf in front of the Steri-Wall that lines or forms the rear wall of the surgery. Parked under the worktop

are glass topped trolleys to be moved as and where required, providing further worktops and placing the 'disposables' stored in them readily to hand. These trolleys are purpose-made with polypropylene drawers in which all internal corners are rounded for ease and thoroughness of cleaning.

Set under the worktop is a purpose-made Corian sink. The electronically triggered tap, incorporating the soap dispenser, projects from the Steri-Wall which conceals the plumbing within. The Steri-Walls also house all the services, the computer, waste bins and clean storage for instruments and materials

SEPARATE DOORS

Each surgery has at least two doors. Patients come and go from the waiting area, other treatment and consultation rooms through a door (typically a frosted glass sliding door set in a screen of the same material) that opens off the patients-only circulation route. Dentists and nurses use another door next to the Steri-Wall. Through it non-disposable contaminated equipment also leaves directly into the 'dirty' decontamination area or into the staff-only circulation that leads to this, reception and various staff-only facilities.

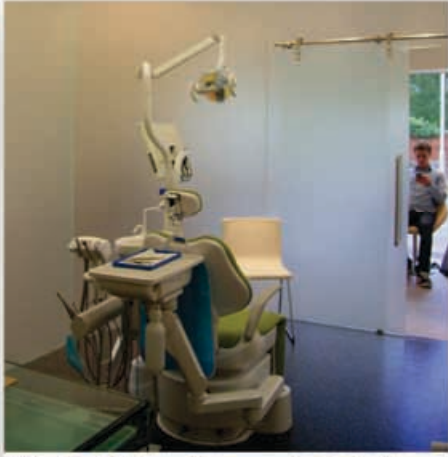
Ideally the Steri-Walls along the back of the surgeries are double-sided to be accessible

from both the surgery and the staff area behind. Bagged and sterilised equipment can then be loaded directly from the latter ready for use in the surgery to be unwrapped in the presence of the patient. When space constraints prevent double-sided Steri-Walls, perhaps when upgrading an existing clinic, single-sided ones can be used. Where X-ray equipment in a surgery requires it, the double-sided Steri-Walls are rendered radiopaque with a lining of 1mm of lead sheet on one side, usually the non-surgery side.

DECONTAMINATION ROOMS

Typically, we place the decontamination rooms centrally in the clinic and design them so that patients are reassuringly aware of this crucial facility. Here, in contrast to the surgeries, worktops are of seamless stainless steel with seamlessly integrated stainless-steel sinks.

A single decontamination room will meet the new code, but only in the interim. To meet the 'best practice' standards demanded in five years' time a double decontamination room is required. The rooms separated by a partition and each room having separate access, wash-hand basins, air supply and extraction. Such a facility occupies at least 8m² (86ft²), so many existing clinics might have to sacrifice a



With cabinets at the rear of the surgery only, instead of the usual L or U-shaped layout, the room feels more spacious

surgery to accommodate it. (The single room decontamination facilities we used to install all follow a strict dirty to clean sequence in their layout and the placing of equipment; they are thus easily upgraded to best practice standards by inserting a glass screen.) In the

decontamination area, used instruments are first cleaned in the dirty decontamination room, ideally in an instrument washer/ disinfectant with a pass-through facility into the clean decontamination room. Here instruments are bagged and sterilised prior

to being returned to the clean storage in the Steri-Walls.

THE BENEFITS OF FLOW

As should be clear from this brief description, these clinics are designed around a series of logical flows - of patients, dentists and staff, and equipment, both disposable and reusable - all designed for the calm efficiency that characterise these clinics as much as the control of cross infection. I'll return to the many other benefits of this approach in the future articles.

Next month: Efficiency and ergonomics

The Steri-Walls are now available directly from Henry Schein. www.henryschein.co.uk.

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EFFICIENT DESIGN THROUGH ERGONOMICS

Focusing on the smooth flow of patients and staff when designing a practice means thinking about ergonomics. In the second article of the series, Richard Mitzman looks at the benefits this brings

Ergonomics is about more than just the placing and dimensioning of equipment and spaces, so they are as efficient and easy to use as possible. It is also about considering the quality of the lighting in each space, to make sure it aids the treatment process and creates a pleasant, calming ambience; and managing the flow of people around the practice to make sure spaces don't become too crowded.

The key elements to this approach include utilising twin surgeries for each dentist (each surgery should be compact, with limited worktops and fitted out with the fixtures we have developed), introducing segregated circulation for patients and staff, and



Having twin surgeries saves time and provides patients with a smoother service

*After 20 years as a dental practitioner, Richard Mitzman moved into architecture, founding his own award-winning firm which specialises in medical and dental projects.
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employing separate decontamination units, which are now required to meet HTM 01-05 best practice standards.

TWIN SURGERIES

The prime reason for using twin surgeries is to allow the 'dirty' surgery to be thoroughly cleaned after use and prepared prior to the next patient. This is convenient for the nurses, as it gives them time to do this. This arrangement also saves the dentists huge amounts of time, as they will be able to work on their next patient straight away, without having to wait for the surgery to be prepared.

Even if this saves a dentist only five minutes between each patient, this equates to at least one hour a day, which is equivalent to 18 hours a month, amounting to 240 hours a year.

An incredible six weeks a year watching your surgery being cleaned and being stressed due to running late, could be time better spent, for example, with your family, on the golf course, fishing, talking with your patients or earning a higher income.

In fact, several dentists report that using two surgeries saves them even more time than this; particularly when carrying out advanced surgical procedures, such as implants, when the surgery needs not only to be cleaned, but also prepared with surgical drapes, and so on.

INCREASED PATIENTS

After we designed and built the Advance Dental Clinic in Chelmsford in 2003, the practice's number of registered patients and

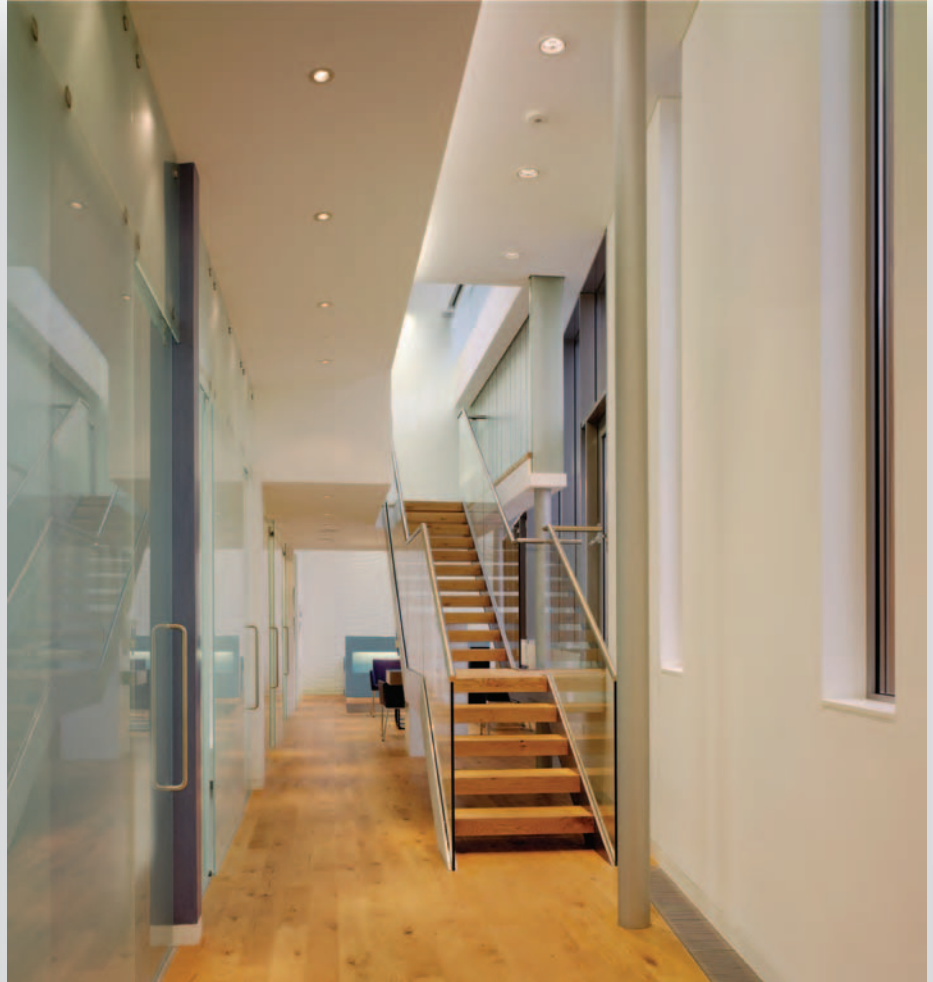


Glass surfaces with integrated sinks are seen to be clean, while taps with sensors for water, soap and disinfectant with workings hidden in a cupboard





Skylights provide good natural light, as well as providing an outlook for the patient. This picture also shows a single-sided Steri-Wall (Advance Dental Clinic, Chelmsford)



'Dual circulation' design elements to segregate patients and staff, such as this patients' corridor, help to prevent the two users clashing, and in turn, avoids accidents (Advance Dental Clinic, Chelmsford)

referrals grew rapidly. To meet demand, the practice's owner and dentist Andrew Moore had to hire a second associate dentist and consequently found himself displaced from his second surgery.

He not only found the time lost waiting for his single surgery to be cleaned very frustrating, but noted that it also cost him a lot in diminished productivity. One of the reasons he commissioned the extension of a dedicated implant and advanced surgical unit to his clinic was so that he would have two surgeries to himself again.

Although advanced surgical spaces have to be relatively large, generally, dental surgeries are too big. Together with the kitchen-type layout of cabinets in a 'U' or 'L'-shape around

the chair that invites clutter, which wastes considerable time in cleaning, they are less than ideal ergonomically.

THE PERFECT SPACE

I advocate a surgery of only 2.7 to 3m wide, by between 3.4 and 4m long with a single 'seen to be clean' glass worktop projecting forward from the Steri-Wall forming the rear wall of the surgery.

Glass-topped trolleys garaged under this worktop provide further work surface that can be positioned where ergonomically ideal for the dentist and whatever procedure he/she is engaged in. These trolleys also contain all disposable items, bringing them immediately to hand.

Once used, disposables are placed in a standard yellow surgical waste bag within the Steri-Wall that is removed from the staff corridor behind it. To prevent cross infection, but also for ergonomic convenience, I would make sure that the sinks are made from Corian or stainless steel, and have Miscea taps with sensors to dispense soap and disinfectant, as well as water at the desired temperature.

The 'seen to be clean' glass surfaces, the large rubber tile floors with minimal number of joints, and every detail of the purpose-designed fittings have been developed so they are easy to clean, as much as to control cross infection.



Decontamination areas: here the dirty area is on the left and the clean area on the right, either side of a staff corridor



NATURAL LIGHT

Light is also crucial in a surgery. As well as providing ideal artificial light of at least 500 Lux at the operating plane, we also admit as much natural light as possible. Typically, this floods in through the frosted glass and sliding door of the same material that separates the naturally lit patient-circulation zone. Where possible, we also provide a skylight above each chair, not only for optimal light, but also as outlook for the reclining patient. The changing view of sky and clouds and the varying natural light from all sources add a calming quality to the room.

Together with the compact, yet adjustable, ergonomic efficiency of the room and the avoidance of frustrating downtime between patients, this all makes it easier for dentists to focus without distraction at the task in hand and to perform at their best.

THE RIGHT ATMOSPHERE

The 'dual circulation' design elements segregating patient and staff help avoid clashes between these two users, such as spillages. This also accentuates the sense of calm conducive to concentration and productivity.

Creating the right atmosphere in each part of the clinic is the reason for the contrasting

design styles; for example, the highly clinical look to the staff areas – all stainless-steel, glass and rubber – to the warmer, more domestic feel in the patient areas, with their wooden floors.

Meanwhile, the double-sided Steri-Walls, into which sterilised and wrapped instruments are placed directly from the 'clean' decontamination room or staff corridor are also devised to minimise movements of nurses carrying and storing this equipment, and the disturbances this might otherwise bring within the surgeries.

Our approach to the design of clinics may give more space to circulation, compensated for by the smaller surgeries, than conventional layouts. But it minimises the amount of unnecessary movement by dentists and nurses within the surgeries and their dedicated circulation.

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A single decontamination room will meet the new code, but only in the interim. To meet the 'best practice' standards demanded in five years' time a double decontamination room is required, the rooms separated by a partition and each room having separate access, wash-hand basins, air supply and extraction. Such a facility occupies at least 8m² (86ft²), so many existing clinics might have to sacrifice a surgery to accommodate it. (The single room decontamination facilities we used to install all follow a strict dirty to clean sequence in their layout and the placing of equipment; they are thus easily upgraded to best practice standards by inserting a glass screen.)

In the decontamination area, used instruments are first cleaned in the dirty decontamination room, ideally in an instrument washer/disinfector with a pass-through facility into the clean decontamination room. Here instruments are bagged and sterilised prior to being returned to the clean storage in the Steri-Walls.

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A NEW SURGERY DESIGNED TO ATTRACT

As well as boosting profits, a new practice can help attract and retain new patients and high-calibre staff, says Richard Mitzman in the final article of his design series



Having twin surgeries can save a dentist five minutes or more between patients, which can add up to six weeks over a year (Gentle Dental Care, Croydon)



Dentists report patients take pride in attending a well-designed and contemporary-looking practice (Advance Dental Clinic, Chelmsford)

In my previous two articles, I talked about how my firm's approach to dental practice design focuses on cross-infection control and optimising ergonomics and efficiency, and the practical and aesthetic benefits this approach brings. But there are many economic and other, wider benefits that also come from adopting this approach, which extend beyond those that accrue from greater productivity.

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We already know that productivity increases by incorporating a twin-surgery design to minimise downtime between patients, while improving ergonomics in small compact surgeries by using moveable trolleys for equipment and supplementary worktops, can make carrying out treatment a lot smoother.

SAVING TIME

If having two surgeries saves a dentist only five minutes lost time waiting for a surgery to be cleaned and prepared between patients, this amounts to six weeks over a year. That is, six weeks of extra earnings per dentist, or the same in free time to be spent with family, on holiday,

or on extra study, for example. However, almost every dentist for whom we have designed a new clinic reports that the time saved between patients is a lot more than five minutes. This is particularly true when the surgery has to be prepared for more demanding procedures requiring sterile drapes, and so on.

WORK IT OUT

We recommend that all dentists calculate the implications of this on their practices. On this basis alone, these clinics are sound investments with any extra costs quickly paid off. Such benefits are easily quantified financially, which is why dentists have been coming to us.

CONT



Creating a practice that is not only efficient, but also aesthetically impressive will make it a place patients and surgery staff will enjoy spending time in (Green Room Dental, Newquay)



Extensive use of glass creates a sense of spaciousness and general serenity (321 Dental Finchley Road, London)

Other benefits resulting from our approach (not least that the twin-surgery approach allows the dentist to work through the day with no distractions) are less easily measured, yet equally important. They result from creating an environment that is not only efficient and reassuringly, visibly hygienic, but also has an atmosphere and aesthetic that enhances every aspect of the experience of being there for patients, dentists and their staff.

A TRANQUIL SETTING

Despite furnishing waiting areas with stylish contemporary furniture in cheerful colours, we always seek to create a sense of calm. This is achieved in various ways. There is something reassuring and subtly enlivening about the presence and shifting play of natural light, compared with artificial light. Abundant natural light is admitted from as many sources and directions as possible, from roof lights and clerestories (windows placed near the ceiling), as well as conventional and plate glass windows, and penetrates into all parts of the clinic, through frosted glass screens and wide sliding doors. The natural light coming through the glass also creates a sense of space.

Here, as elsewhere, materials are chosen carefully to create certain effects, for example, stainless steel to add further sparkle to the glass, wood strip or ceramic tile to give warmth to the floors of the patient areas, and panels of coloured polished plaster to add an intriguing, soothing coolness to a surgery wall.

THE WOW FACTOR

Wherever possible in each clinic, we like to add an eye-catching and out-of-the-ordinary element that will make the clinic memorable and give it an individual identity. This might be a soaring double-height space or an elegantly floating stainless steel and glass stair, or both of these together.

It might be a rhythmic series of bulging frosted-glass curves enclosing the surgeries and giving a spatial dynamism to the patient areas, or shafts of light admitted from high up and/or soothing views of the sky from the dental chair. And always the choice and placing of furniture, fittings (such as coffee machines) and any decorative elements (such as



Each practice design incorporates an individual design feature, such as this elegant floating stainless steel and glass staircase (Pentangle, Newbury)

a sculptural mobile in a children's dental clinic) is calculated to add to its identity.

Dentists report that many patients comment positively on both the premises and the equipment in them. People are more alert to such things than many give them credit for and enjoy and take pride in attending a beautifully designed and built, up-to-the-minute clinic. The result is to attract and help keep new patients.

When we built the new Advance Dental Clinic in 2004, dentist Andrew Moore says he was attracting 30 new patients each month, some of whom initially visited just to see the building after reports in the local press that it had won a prestigious architectural award. Other dentists regularly report patients bringing friends and family to see the new premises, often leading to their becoming new patients.

Dentists and staff also prefer, and are proud, to work in aesthetically pleasing premises that

KEY POINTS

- Design out clutter
- Use twin, simple surgeries
- Incorporate central decontamination areas, plus clean storage
- Dual-circulation separating staff and patients
- Maximise light and translucency
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contribute to a sense of calm efficiency. This not only attracts a high-calibre of staff, but also helps to keep them. This in itself is an economic benefit because a staff member thoroughly familiar with the running of a particular clinic is worth considerably more than a recent arrival still learning the ropes.



Double-sided Steri-Walls are accessible from both the surgery and the area behind

STERI-WALL BENEFITS

- Efficient and productive
- HTM01-05 compliant
- Prevents cross infection
- No clutter
- More patients
- Increased storage

STERI-WALLS

The 'Steriwalls' concept created by Dr Richard Mitzman features a 'wall' of cabinets behind the dental chair. These can be single access and replace conventional cabinetry or can be accessed from both sides and divide the surgery from the staff areas and decontamination rooms. The surgeries can be restocked by the nurse from the other side without needing to enter the surgery. All the clutter that is so often

stored in drawers in the surgery to gather dust can also be kept outside the surgery. This also creates a corridor for staff to move around the practice separately from patients. Separate circulation of patients and staff within the practice is a central part of Richard's designs, with separate patient transitional zones that to help reduce the patient's anxiety at being 'summoned' to the dentist.

This alternative to traditional L-shape cabinetry has been created by Dr Richard Mitzman and is exclusively distributed by Henry Schein Minerva Dental.

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