

Coffee Houses and Reading Rooms

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The famous Austrian writer Stephan Zweig is again very popular thanks to the reprinting of many of his books. Just a few days before committing suicide (together with his wife) in Rio de Janeiro (1942), he finished *The World of Yesterday*.^{*} A little over a year later, Viking Press published it in English. In it, Zweig extolls the role that cafés played in Vienna before, during, and just after the First World War. In this book, cafés are said to have been places of culture and the exchange of ideas. For the price of a cup of coffee, one could read an unlimited number of newspapers and journals, engage in conversation with others (no matter how famous, thus the “democratic” feel of these places), write, listen to literary readings, and, overall, learn about what was going on and express one’s own ideas and points of view.

Because I live in a small university town with many cafés, it is quite obvious to me that this has changed dramatically. Although the “gaining information” part is still probably true, most individuals in cafés sit by themselves, with their computers and other electronic personal devices in front of them, and do not talk to anyone: Silence reigns. Folks are actually afraid to talk in these places and even order in whispers! When there, I know that I feel as if I just entered a library and not a café. In many, the price of a cup of coffee will buy only a limited time to be on-line, which, once reached, results in customers leaving for the next café for another hour of Internet, solitude, and silence. One can safely assume that this occurs all over the United States and that except for information being exchanged on-line, cafés have become fairly isolating places. A few years ago, while in Buenos Aires, I found myself in café where people were talking, arguing, playing chess, and smoking. What a miracle that was, and how unfortunate that our dysfunctional coffee house model has now extended to other parts of our lives.

Isn’t this what has also happened to our radiology reading rooms? Before the PACS, referring physicians would come to the reading room, often carrying articles, journals, or books to show and share with us and to talk about patients. They would get the benefit of listening to us while we obtained information that helped us interpret the findings, making us better radiologists. Ideas for many new projects arose from these interactions. Nowadays, our referring physicians almost never come to the reading room, and they look at the images themselves. When they disagree with our reports, they tend to ignore them and place their own thoughts in the patient’s record.

RedRick Technologies is a company that prides itself in creating the “reading room of the future.”¹ One look at their work-

zone solutions reveals large rooms partitioned into smaller spaces by all sorts of acoustic treatments effectively isolating radiologists from their surroundings, which probably makes consultations with clinical teams impossible. In these spaces, noise abatement is imperative so that voice recognition systems will function optimally. In a 12-page white paper entitled “Designing the Perfect Reading Room for Digital Mammography,” not one mention is made of space for interaction with referring physicians, but a lot of content is dedicated to eliminating noise, the correct ambient lighting, soothing wall colors, interpreting a large number of studies per year, low time per study, and fast turnaround times.² Placing reading rooms away from heavy foot traffic is advised, but again, it results in remoteness that makes it inconvenient for referring physicians. Conversely, another article states that because information can be moved anywhere, having our reading rooms close to where patient care is occurring enables our involvement with specialists and patients and promotes collaboration and communication.³ This article also recommends a minimum of 125 square feet per reading station, which is larger than that found in traditional reading rooms and makes for better and more pleasant consultations. Their design plans even have spaces for bookshelves! Architects know that sound control is more difficult in small partitioned spaces than in larger ones. Partitions in parallel arrangements also make noise more difficult to control.

Both articles here cited are older than 10 years. Fast forward to 2012, and the ideas expressed in them seem not to have changed as seen in an article “Building a New Radiology Reading Room: Lessons Learned” published in *Diagnostic Imaging*.⁴ The “reading room of the future” strives to be a “low stress” environment. When asked, radiologists perceive extraneous noise as one of the most stressful issues in reading rooms. When adding acoustic insulating paneling is not enough, some have tried noise-cancellation technology (similar to that used in some newer cars to block the noise produced by engines and tire-road contact). In reading rooms, these systems emit a noise that is related to the frequency of background human voices to help diminish them and help voice-recognition work optimally. Music apparently also helps improve the radiologist’s working environment. In one small experiment, radiologists listened to Baroque music via the Pandora music streaming service (<http://www.pandora.com/>). Five of 8 indicated that music made them more relaxed, 3 said it improved concentration, 2 noticed increased productivity and greater diagnostic accuracy, and half felt that overall it improved work satisfaction.⁵

In the past, our reading rooms needed to be dark, but as our displays got brighter, many current reading rooms now have windows. Nicely lit rooms are inviting to our colleagues. Plans for future reading rooms include intelligent ambient lighting that changes in color and intensity throughout the day (similar to that found in the new commercial airplanes such as the Boeing 787). Having lots of glass around the radiologists may help bring in light, and this concept was taken to the extreme when the Univer-

^{*}The (great) movie, *The Grand Budapest Hotel*, written and directed by Wes Anderson, pays homage to this book by Zweig.

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sity of Pennsylvania had plans to place its radiologists in what was called the “fishbowl.” In it, patients would have been able to see them work, but the plan was eventually dropped as patients apparently were not interested in watching radiologists work (pretty boring to watch if you ask me).⁶ As the luminosity of our monitors improves, background lighting of higher intensity is sometimes allowed. Ambient lighting, particularly of the fluorescent type, results in fatigue, so it must be carefully used.⁷ Conversely, higher luminosity screens result in less fatigue. Ambient light color should match the images displayed on the screens so that interpretation of studies becomes easier. Bones are easier to examine with yellow background light; gray-scale images, with blue light; colored renderings of blood flow, with red light; and so forth.⁸ Overall, 90% of the light should come from indirect fixtures, while 10% should arise from direct sources. Reflection on screens is basically negligible for flat panel monitors, but radiologists still seem to prefer dark spaces with only task lighting when needed.

There are 2 tendencies with respect to reading room designs: to consolidate into 1 or 2 large “ballrooms” or to split these larger rooms into smaller enclosures. Obviously, consolidation is cheaper, the help of others may expedite interpretations, and hopefully, there will be some cross-pollination of ideas. These larger rooms can be furnished in 2 ways: peripheral or central spine approaches.⁷ In the latter, a long central axis of reading stations is placed in the middle of a room, while in the former, the PACS stations are located on the periphery of the room, a disposition that most radiologists prefer as do administrators because more radiologists can be crammed into 1 room. In my own reading room, we opted for both arrangements (luckily we have a lot of space; to view a similar idea, watch “UCLA—Designing Radiology Reading Rooms for the Next Millennium” on YouTube). One side has the usual peripheral arrangement, and the other side has a round carrel housing 3 reading stations (wires come into its central portion through the ceiling, resulting in a cleaner, organized look). On the square side, there is space to seat about 20 individuals, and with the help of a large-screen television on the wall, we have most of our conferences and consultations with referring physicians there. This sort of mixed arrangement leaves space for 1 view box (remember them?) on 1 wall.

Because the need for view boxes has nearly gone away, reading rooms with hybrid (electronic and conventional) arrangements are few. Some institutions have remodeled their ballrooms into smaller, individualized spaces. This is typically the case in some private practices or when radiologists interpret studies from home. The compromise is to create medium-sized reading rooms that house 3–4 radiologists, hopefully all with similar interests and expertise. By locating these reading rooms in the central part of an older ballroom, the periphery is free and can be used for collaborations and consultations. While most of us still interpret sitting, others like to stand when working. Most radiologists prefer their electronic medical record (or clinical information system) display to the right of the imaging monitors. Some years ago, we had a fellow who had carpal tunnel syndrome, and though I will not discuss ergonomics of equipment and furniture here, we got him a gaming mouse that exasperated me with its ridiculous high sensitivity but helped ease his pain. We do not have cup

holders in our reading room, but I agree that they prevent spills and accidents and help keep work surfaces cleaner.

In 2007, at the Radiological Society of North America annual meeting, Philips Healthcare exhibited what they called “Reading Room 2020.” One continuous acoustic wall surrounded the radiologist, and its flattest portion served as a huge screen. Its PACS was keyboard- and mouseless with all of these interfaces projected onto the flat surface of the working table, and all of this was complemented by ambient color-changing lighting. You can still watch a video of it on YouTube. Watching it reminds me of the command deck on the Enterprise on one of the more recent *Star Trek* movies, and though conceptually it was a beautiful idea, today it seems impractical and too expensive. A few years before (2004), GE Healthcare also showed its version of its reading room of the future, which now looks like a cross between an inexpensive spaceship and one of those portable self-cleaning toilets found in the streets of Paris.

The best place for our reading rooms of the future is where patients will be cared for. One recent article describes an initial experience with integrating a reading room with a clinic. A radiologist was present in the area for a 3-hour shift each day, and not surprising, the referring physicians stated that more than 90% of consultations benefited patient care and most affected management.⁹ The radiologist’s presence was critical when reviewing external images brought in by patients. The authors of that article clearly stated, “As radiologists go from high volume interpretations to adding value by guiding and counseling clinicians, a shift to the integrated radiology reading room makes sense.” This type of arrangement would bring back the “café” spirit to our reading rooms by making us work closer, talk more, and exchange ideas with our referring physicians and allow us to work while they are not present. It would also expose our trainees to the patients and their immediate problems.

At home, with my family, we often talk about how much better everything is today compared with the past, but once a week, I like going into the past. Every Thursday, a friend of mine and I get together at a local watering hole that we like because it has no televisions, no Internet, just music coming out of an old Bose system (<http://www.bose.com>) with a tube amplifier, and other people doing nothing but talking, exchanging ideas, and maintaining their friendships over coffee and drinks.

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EDITORIAL

Teaching Lessons by MR CLEAN

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After centuries of therapeutic nihilism for patients with ischemic stroke and 2 decades of systemic thrombolytic therapy with modest effects, there is hope that increasing arterial recanalization rates with endovascular treatment (EVT) can improve clinical and functional outcomes. Given that data from 3 previous randomized trials (SYNTHESIS Expansion, Interventional Management of Stroke III [IMS III], and Mechanical Retrieval and Recanalization of Stroke Clots Using Embolectomy [MR-RESCUE]) failed to demonstrate a beneficial clinical effect, the positive outcomes from the Multicenter Randomized Clinical trial of Endovascular treatment for Acute ischemic stroke in the Netherlands (MR CLEAN) have renewed the enthusiasm and hope among physicians treating stroke.^{1–4} Initial data from additional trials (Endovascular Treatment for Small Core and Proximal Occlusion Ischemic Stroke [ESCAPE], Extending the Time for Thrombolysis in Emergency Neurological Deficits-Intra-Arterial [EXTEND-IA], and Solitaire FR With the Intention For Thrombectomy as Primary Endovascular Treatment for Acute Ischemic Stroke [SWIFT PRIME]) provide further evidence supporting the MR CLEAN results.^{5,6} It appears that the new-generation interventional devices could enable highly effective stroke treatment in a time window broader than before, making restrictions of IV therapy alone either clinically irrelevant or applying to a very defined patient population.

Why Is the MR CLEAN Outcome Positive?

MR CLEAN was designed to compare EVT plus usual stroke care (intervention) versus usual stroke care alone (control) in 500 patients with proved occlusions of proximal major arteries of the anterior cerebral circulation. Usual stroke care included treatment with IV-rtPA in 90.6% of the control patients and 87.1% in intervention patients. All primary and secondary end point results statistically favored EVT, especially in a population in which poor prognosis is seen with usual stroke care alone. On the basis of the imaging data, the absence of arterial occlusion at the target site on

24-hour CTA was significantly higher with EVT compared with usual stroke care alone (75.4% versus 32.9%; OR, 6.27). Compared with another large prospective EVT/stent retriever series such as the Solitaire Thrombectomy for Acute Revascularization (STAR) (79.2%), the successful reperfusion rate on DSA (TICI 2b or 3) was lower in MR CLEAN (58.7%).⁷ In both trials, TICI was independently evaluated by a core laboratory, but as mentioned by the MR CLEAN authors, the differentiation between 2a and 2b was not always easy, particularly in the absence of a lateral DSA view. In such cases, a conservative approach was taken and recanalization was graded as TICI 2a. In addition, center experience may be an important factor to consider. STAR was conducted in highly experienced neurointerventional centers, whereas MR CLEAN was conducted in 16 Dutch centers with at least 1 member of the intervention team having completed at least 5 procedures with a particular type of device.

Most important, MR CLEAN results demonstrated an increased rate of functional independence in the EVT group (32.6%) compared with the usual care group (19.1%), with an absolute difference of 13.5%. Compared with previous randomized trials, the percentage of patients with favorable clinical outcomes in MR CLEAN is relatively low (40.8% in IMS III and 42.0% in SYNTHESIS) and even lower than that in the placebo group in the European Cooperative Acute Stroke Study (ECASS III) (45%).⁸ It can be presumed that some patients who were enrolled into previous trials such as ECASS-III, IMS-III, and SYNTHESIS had spontaneous good clinical outcomes because they did not require confirmation of large-vessel occlusion (LVO) with baseline imaging. However, compared with EVT/stent-retriever studies requiring baseline vessel imaging, the rate of functional independence reported in MR CLEAN is low (SWIFT, 37%; STAR, 57.9%; Thrombectomy Revascularization of Large Vessel Occlusions in Acute Ischemic Stroke 2 [TREVO 2], 40%; North American Solitaire Stent-Retriever Acute Stroke Registry [NASA Registry], 42%).^{7,9–11}

The MR CLEAN patient population primarily comprised patients who had failed IV-rtPA (ie, IV-rtPA–treated patients without clinical improvement after receiving only the full dose administered during 1 hour). Most of the centers initiated rtPA after plain CT and subsequently performed CTA only when it had been determined that the patient was not clinically improving. Given that close to 90% of patients in both arms received IV-rtPA, the treatment response of this particular patient population can per se explain the poor outcome of the usual treatment arm. The MR CLEAN population is different in comparison with those in previous and upcoming trials. In terms of workflow metrics, there was a long delay between symptom onset and groin puncture in MR CLEAN (260 minutes compared with 208 minutes in IMS III and 225 minutes in SYNTHESIS). Initiation of IV treatment was not delayed in MR CLEAN (87 minutes) compared with IMS III (121 minutes) and SYNTHESIS (165 minutes).

Another contributing factor is the screening of consecutive eligible patients into the MR CLEAN trial. The Dutch health system allowed EVT for ischemic stroke only inside the MR CLEAN trial. This factor enabled high recruitment rates and avoided the “cherry picking” of presumably easy-to-treat patients. MR CLEAN was thus a “real life” study in a small country with short