DIMHN presentation

Philip Ross 21st May 2019

Introduction – why testing?

Before I get into the world of testing, I thought it would be helpful to share why DIMHN has invested so much time and effort in the product accreditation initiative for the past five years.

Quite simply, our goal is to help people get better from mental ill health. *Everyone in this room has a* collective believe that good design is a major part of delivering that outcome.

Good design that allows the building to have a positive, not a negative impact on patients' wellbeing and creates a safe space that facilitates therapeutic care. Leading to a better and more sustaining recovery.

Good design will also create better working environments for staff, aiding the development of trust between clinicians and patients, enabling better therapeutic interactions. Not to mention helping with the staffing and retention challenges present in mental health services across the UK.

And good healing and working environments can only happen with good products.

The problem with the current testing regime

There are a number of limitations with the current testing approach.

We'll start by looking at the robustness testing from the Medium Secure design guide.

- Use of rubber mallets and paving mauls, ambiguous, so a wide range of interpretations
- Not repeatable, often carried out in silos and not independent

And then if we look at the TS001 anti-ligature testing, it is limited in the scope of what types of products it covers and only considers the most basic of ligature attempts.

And what other criteria have we missed? You only have to look at the safety alert issue in August 2017 relating to the dangers of push button stops and other anti-barricade devices not working under active manipulation and pressure from within the room.

- Problem alerted to estates and risk teams across the UK
- No guidance on how to assess current products – either in situ or for considerations on new build or refurb projects

Testing of ligature and robustness performance is also a major time sink for projects. Consuming 2-3 months of collective time.

- And we test in silos – both at Trust or Health board, or project level
    - Adds significant cost – in time and sample procurement
- Restricts the amount of time given to consideration of products impact on the wellbeing of the people with mental ill health and staff's ability to do their job
    - This is the most important place to spend time if we're going to continue making better spaces for recovery

Parallels – learning from other products used in construction

I'm going to use a parallel throughout todays presentation – fire doors.

The first point we can take is the benefits of reliable, repeatable and independent testing and certification.

- We test fire doors once, using an independent, UKAS accredited test laboratory
- 3rd party accreditation scheme to ensure product manufactured to consistent quality – assessing processes and systems

This approach allows specifiers to assess various products or suppliers robustly and quickly.

The second aspect of fire doors to look at is how varying levels of performance used throughout a building. Look at the fire strategy on screen and you'll see we use a mix of FD30 and FD60, with FD120 or FD240 in the highest risk examples.

Two major parts to take from this approach

- Accurate performance helps building owners understand the risks involved and create risk management strategies based on these – best example here is the fire escape plan
- It also helps specifiers choose the right product based on this risk management plan, which will help manage overall budgets

Evidence based

Translating these principles for products testing for mental health needs the equivalent evidence as a starting point.

The first decision DIMHN and BRE chose is to focus on the criteria for product selection that can be objectively measured. Allowing more clinical and design time to be spent on the recovery and wellbeing aspects of different products as this tends to be more subjective *(at the moment)*.

We carried out an extensive survey in 2014, which suggested doors, hardware and windows were the priority for better testing. However, after reviewing the requirements of other areas, we reorganised the testing process to allow coverage of all products for the two most significant performance concerns:

- Ligature
- Robustness

And retained some specifics for doorsets, hardware and windows:

- Anti-barricade is one example for doors
- Ease of cleaning is one that specifically relates to the mesh on sliding windows

To allow the testing to work for the wide range of care pathways, we decided to use a test and declare approach. This means no product will pass or fail, but the performance against a number of testing criteria captured and shared. Helping specifiers make informed choices.

We carried out a number of workshops across the country, getting input from almost 150 experts actively involved in MH. This included estates and facility managers, architects, clinical staff and product manufacturers.

- Used to understand what type of ‘failures’ currently occur and what problems we have to capture in our performance evaluation
- Getting input on the clinical needs and understanding how their risk assessments and management policies are affected by product based risks

We also searched journals to ensure the ligature performance was based upon the medical research. A couple of Russian studies into the issue of how ligatures are carried out, including the various angles and weights when different parts of the body are supported was particularly helpful.

For the robustness aspects, we had to consider the ‘super human’ strength when people’s pain receptors are not as responsive due to psychosis or strong medication. We looked at studies into the forces of kicks and punches of elite fighters and Olympic boxers, alongside a raft of other anthropometric data. This was used alongside body weight calculations with momentum to better understand what forces can be achieved.

One of the other major aspect that came up during the workshops was the determination and time that people in mental health care settings have to plan and enact attacks on products with the goal of self-harm.

- Patient learning process built into testing to capture when there are coordinated incidents to learn about staff procedures.

So what's different about BRE/DIMHN testing to everything else?

A regular feedback point we recorded during the workshops was the challenges of designing mental health environments. Both when looking at products and the overall project, people highlighted the various conflicting requirements:

- Privacy vs. safety
- Robustness vs. homely
- Ligature resistance vs. grip or slips, trips and falls

We recognise that improving design of mental health spaces for safety and recovery is about encouraging innovation to overcome these conflicts in the long term. In the meantime, we can help specifiers and clinical teams make good decisions on projects – factoring in what risks can be managed through clinical observations and what must be reduced by products.

Ultimately, until the perfect product comes along, it's about choosing the right place to compromise. And ensuring the clinical risk management procedures can be suitably informed.

And this decision will be different for each care pathway.

In order to make good decisions, we needed a more comprehensive range of tests than currently available – differentiating between simple and determined ligature attempts or physical attacks.

Ligature

Ligature is an interesting topic, one that is too binary right now with a wide range of products given the same label of ‘anti-ligature’. We’ve focused on using medical data to give graded performance benchmarks, more accurately capturing the spectrum of ligature risk reduction. And, hopefully, banishing the term ‘anti-ligature’ which is too absolute when you factor in the determination and time patients devote to thinking up innovative ways to self-harm or in the worst case end their life.

Reduced ligature products behave in different ways, employing different risk management approaches, and we needed a range of tests to assess their specific approach to ligature risk reduction.

- Fixed product
- Moveable fixed products
- Load release
- Alarm based alerting systems

A recent safety note highlighted the need to consider all risks, irrespective of height in unsupervised areas like bedrooms and en-suites.

When you start looking at different heights of ligature points, you also have to think about the load pattern. It’s not as simply as attaching something and pulling up or down, you’ve got to think about the way the attachment is made, the direction of load and how it is converted to a ligature.

We've factored in the determination and time aspects to testing, creating different grades of performance based on the products ability to cope with:

- No planning (ie. impulse)
- Some planning
- A great deal of planning

The latter here would involve multiple attempts to capture the patient practice and learning process, allowing for a total of 40 minutes of time to manipulate the device with commonly available tools – items of clothing, bed sheets, use of a broken CD or just brute force.

Robustness

The biggest step forward for assessing robustness performance is the creation of testing processes that are able to be consistently applied, repeatable and carried out once.

To overcome the problems with current robustness testing, we've looked at a wide range of testing regimes, largely from the security sector.

We've combined this with our own experience in MH, factoring in the 'super human' strength, and ensured that all types of attacks on products are covered – using weapons, body force or stealth attacks.

We also know that a product's performance can be affected by the substrate it's fitted to, so in some cases we'll be testing products with a range of construction details.

One example of how we've tried to make the testing reflect real world would be a body ram on a door, currently represented by a paving maul – hitting products at all heights. By contrast, we've captured a number of important points:

1. The scope of impact on the product – in this example, it's from waist to shoulder height
2. The size of impact element and its density – in this example, we use a standardized pendulum impactor
3. The direction of force and its momentum – important to capture whether the person is running from the other side of their bedroom or the full length of a corridor

By contrast, if you think about a punch, the force is a much smaller surface area, can attack items both high and low in multiple directions.

No product is indestructible. So we decided it was important to test all products to failure through prolonged attacks and make this information available to staff to ensure their risk assessments and management procedures are correctly informed.

This will not only inform the time to failure, but how the failure occurred and whether there are any early signs of failure that should be looked for after an attack.

One example of this in play in real life would be informing what the intervention policy is for a room. If a product being attacked is known to fail after 2 hours, risk management procedures could direct staff to intervene after 1 hour, allowing for a factor of safety.

'Stealth' attacks - non-audible or visible attacks, by simply picking at a product over time or using a credit card to create heat friction on a section of rubber to expose a ligature point.

Doors, hardware and windows

We also created some category specific tests for critical performance measures not captured in the 'all product' ligature and robustness tests.

One example of this is the anti-barricade performance of doorsets. A topic that came into sharp focus when a nationwide safety alert was issued following a hostage incident. A cleaner's life was at risk when excess pressure was applied on the inside of the door made the anti-barricade device inoperable.

Like the tests developed for assessing ligature performance, we've factored in the patient learning process and the determination employed in the attempt to prevent the staff override mechanism.

We'll allow the test engineer to observe the anti-barricade system to being used 10 times to allow them to try and tamper with the mechanism to prevent operation.

We'll then grade performance based on:

- No planning (ie. a slam of a door only)
- Some planning and manipulation
- A great deal of planning and manipulation

We'll capture the timing against each of these scenarios.

Next steps

We're going to be releasing the draft test guidance week of the 3rd June with a 4-week consultation process – all managed by BRE.

It's important to make your voice heard, so please join DIMHN or register to take part.

Following this, BRE will carry out a full review and process this into the testing guidance or explain why the feedback is not being adopted. Once we have the final version in hand, it needs to be assessed by the BRE Governing Body to ensure independence, impartiality and the testing guidance meets their strict requirements.

We took a decision relatively early to set out our preference to have a single organisation test all products. Partly due to the expertise and know-how involved in capturing the ingenuity and determination of patients when testing products, but it also helps us improve the repeatability of human based testing procedures.

Our preference is for BRE to be our designated test body, however, this has not be formally agreed yet. Feedback from BRE has been positive, but it need to be formally reviewed and approved by the board.

We're working towards the testing guidance being finalized and BRE ready to test and certify products performance by the end of 2019.

Closing summary

I know that's quite a lot of information, but after 5 years of working on this, there was a lot to cover.

I really believe that better clarity of the performance of products used in mental health environments will help the experts – architects, clinicians and estates teams – make better design choices for their projects. Both in terms of reducing risks and knowing what risks remain to ensure the clinical risk management reflects reality.

The ability to shortlist suitable manufacturers using desk based research in a couple of hours, versus months of testing with one supplier will not only lead to better value procurement, but allow more time for assessing the impact of each option on the patient's wellbeing and how these affect clinicians core job of providing therapeutic care, which should drive further improvements.

And it's not just project teams that will benefit.

Manufacturers will be able to be present their performance claims with confidence, encouraging more innovation from new and existing suppliers.

The testing guidance will also help product designers and engineers create the next generation of solutions by using the framework of performance measures to research client requirements and then develop and test against this.

Ultimately, the only way any of this will become a reality is if it's adopted by the people in this room. Simon [NHS Improvement] – your support would be significant, but it's an ask to everyone – from the specifiers who ask for copies of certification to the manufacturers getting their products tested.

And lastly, I'm incredibly proud of what the core and wider team has managed to create together. I believe this testing guidance can be a gamechanger in creating better recovery environments, possibly around the world. So, a huge thank you to everyone involved to date and for the months/years ahead.