

CPD CASE STUDY

KEITH MILLER

Keith is a Rehabilitation Engineer, developing bespoke medical devices to aid mobility in severely disabled patients. After demonstrating an admirable approach to his development, we asked him a few questions about how he tackled his CPD:

Q1. How do you approach your CPD?

I don't follow a formal structure for my CPD. I'm very fortunate to work in a department that is constantly looking for new development opportunities, which naturally ensures I have lots of potential CPD activities to choose from. I am very lucky for the changing nature of my work, as a result I never actively set out to perform something just for my CPD record; but I suspect this would be true for any mechanical or development engineer involved in the development of novel products.

My record does contain some repetitive activities. But each one tends to offer a different reflective outcome, which I believe is the most important aspect of CPD.

Q2. How do you identify developmental activities to be included in your record?

Firstly, I put everything that I think is unique, different or interesting into my CPD. Then I look for the learning from each activity through the reflection process. I'm lucky enough to get involved in lots of different development projects, exploratory meetings and interesting activities throughout the year, so I don't find it difficult to add to my CPD record. Some activities are obviously much more interesting than others, but I tend to record them all knowing I can always take some out if need be.

SWOT analysis can be helpful in identifying aspects of my work that either I'm good at or enjoy, as well as identifying areas that could perhaps do with some additional work. My career goals are also important to me, but I don't get involved in CPD opportunities solely to help me meet those goals. I find focussing on my weaknesses and taking new opportunities as they arise will result in enough relevant CPD activities to achieve those goals in the long run.

I don't spend too much time looking at the competences listed in the UK-SPEC with regards to my CPD. I just take my entries & reflection and then look to see where they naturally meet different criteria. Providing my activities cover a broad spectrum of mechanical/medical engineering, I find that they will meet enough opportunities to satisfy large parts of the UK-SPEC. It is often possible to attribute one activity to multiple goals and competences; so rather than focussing on it, I find it naturally falls into place once I've documented my activities. Having said all that, it's still the section of CPD that I find the most challenging.

Q3. How often do you add to your CPD record?

My CPD file is updated in a basic form about three times per year: around Easter, summer and then Christmas. Luckily, I have young children and a wife who is a teacher, so the school holidays serve as a reminder! I use an electronic calendar at work on a daily basis and simply look back through this and note down some key points, regarding what interesting things have happened, and what were the reflective 'takeaways' from it.

Q4. How do you approach reflection on your CPD Activities and Goals?

For me, the key to this is being honest about my abilities, both positively and negatively. I can be very self-doubting in certain respects but confident in others, which is probably a common trait of Engineers! But it's become obvious to me that there are opportunities to learn from almost every workplace activity, I just sometimes need to look a bit harder to identify them. I often observe colleagues & peers thinking 'they do this really well' or 'they seem confident in that' – then ask myself why that is and try to find an answer that I can use to improve my own practices. Working in an NHS Hospital provides countless opportunities to observe much more experienced & skilled individuals than myself, so I'm very fortunate to be surrounded by a wealth of engaging people from which to constantly learn.

Q5. Any advice for other members just getting started?

Don't be fearful of it! Just keep some simple notes of interesting/unique events that happen whilst you work. Even if the events don't appear all that interesting at the time, I'm sure there will be reflective learning you can take from them at a later stage. Then, periodically write them up as part of a more regular reflective practice process i.e., what did you do & what did you learn? Once you get into a habit of doing this, you will find it fairly easy to compile a comprehensive and useful CPD record.

Personal Goals

1. F.Eng accreditation – to become a Fellow of the IMechE in the medium term. I hope to apply for F.Eng. status in the next 5 years as I have now been in a management & technical role for the past 6 years.
2. Increase knowledge – keep up to date with technological advancements in my field and also wider engineering.
3. Source a network of trusted suppliers – Search for suppliers of the components for the ORLAU standing frame and other engineering developments.
4. Transition our QMS to ISO13485:2016 – Work towards the transition to the new standard in late 2019. Put in place a range of measures to meet the new clauses of this standard.
5. Increase staff management skills - grow my abilities in regard to staff management, undertake in-house mentoring scheme and complete a number of tailored, short training programmes.
6. Become a more effective lecturer and public speaker – increase my confidence and ability to present technical information to a professional audience. Seek out opportunities to present and gain experience. Watch other presenters to obtain ideas and tips on how to present in a more engaging style.

Benchmark

I've been a practicing C.Eng. for over 10 years now with more than 20 years of experience in my industry. Whilst I am confident in many areas of my daily work, I still feel there is scope for development in considerable aspects, particularly in presentation style, regulatory affairs, management of staff and applying my knowledge outside of work.

SWOT

- Strengths – design, QMS processes.
- Weaknesses – Professional commitment, Management of individuals, presentation style.
- Opportunities – Internal courses, external exhibitions, meetings.
- Threats – Time management, workload.

My record of CPD activity can be found on the following pages

ID	Development Goal Link	UK Spec Area	Training/Learning Opportunity & Outcome	Reflection	Next steps
1	1, 6	A, C, D, E	<p>6&7/1/19 – Basic Sciences Course. I presented a lecture on Structures & Materials to Orthopaedic Registrars. This was the second year running that I gave a lecture on Structures and Materials to a 40 strong delegation. My lecture provides basic information on material properties in orthopaedics and the importance design plays in the structure of a component or device. The lecture involves subjects such as failure mode, stress & strain, viscoelasticity and various forms of corrosion, to help build up a picture of how fundamental engineering principles are applied to orthopaedics without the trainees realising it. As a second part to this lecture, myself and two engineering colleagues also put on two tutorial sessions for the delegates to attempt past examination papers. I'm instrumental in being on hand to help with understanding at any point through those tutorials. Evidence Appendix A – Basic Science Programme</p>	<p>This presentation is one I am keen to improve over time. I inherited the format from a retired colleague, so part of my role has been to modernise the content. In the past year I have tried to add practical demonstrations to improve the interaction with delegates whilst also lightening the atmosphere to make it slightly less formal. I typically present in a fairly dry style, often due to the content and my confidence, but this is a lecture that I look for opportunities to make more interesting. This year I used 3 different chocolate bars to demonstrate the difference between brittle, ductile and polymeric failures. Next year I hope to add in further practical aspects and improve the style further.</p>	<p>This is an annual event, so I have an opportunity to present again and make improvements where I see necessary. I plan to spend some time watching good presenters to try and get some ideas to use myself.</p>
2	2	A, B	<p>18/1/19 - Ricoh Lever Project meeting. I visited to Ricoh in Telford to discuss the current design of the 3D printed lever. I met with two engineering staff to discuss design changes to the inbuilt ball and socket present in the lever. This was an opportunity to talk through what is possible with their current manufacturing capability. I was also able to get</p>	<p>I find it informative to visit the 3D printing arm of Ricoh UK. They remain one of the largest 3D printing bureaus in the UK, with a commitment to investing in the latest equipment. This is a great resource for me to stay at the forefront of what is possible within the 3D printing world.</p>	<p>This project is nearing completion, but I suspect there will be a version two of the lever once this has concluded</p>

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			a guided tour of the facility, which was housing two further FDM printers than the previous visit. Evidence Appendix B – Lever image		
3	4	B, C	<p>26/2/2019 - BSI ISO 13485:2016 transition audit.</p> <p>This is the year we will transition to the latest version of ISO13485:2016 to coincide with the introduction of the Medical Devices Regulations in May. I've spent a large amount of time determining where our gaps are and have devised a number of new protocols & systems and edited many more to meet the more stringent clauses in the new standard. This has provided an opportunity to revisit some of the lesser used documents to make sure they are still fit for purpose. Explaining our system to external assessors also give me an opportunity to practice clear verbal communication as well as being organised about which information to show.</p> <p>Evidence Appendix C – Email communication</p>	<p>I admit to finding Quality Management a little demotivating [REDACTED]</p> <p>[REDACTED] We as a department are quite small and the latest stringent clauses feel somewhat unachievable given our current resources. I have concerns about meeting the clauses and staying on top of them if and when we do meet them. That being said, it is a challenge that I know will be rewarding at the end. I need to dig deep for resilience towards the QMS aspects of my role and accept it will be a long road to success.</p>	<p>Success in this is likely to redefine my understanding of my resilience levels, this is something I'm sure I can take forward to other aspects of work.</p>
4	2	A, B	<p>6/3/19 – Site visit to Shropshire Wheelchair Service.</p> <p>I was presented with an opportunity to visit the Shropshire wheelchair Service through a colleague at the West Midlands Rehab Centre in Selly Oak. This was a very informative visit where I was lucky enough to observe two patients. One was being assessed for a new wheelchair whilst the other came in for a review</p>	<p>This feels like an underfunded and understaffed service which made me appreciate the relatively easy discussions I often have with patients. Our patients are fully funded, so I don't often have to let them down with news that we cannot provide them with a solution. It also made me realise that my</p>	<p>I will keep an eye out for this subject to crop up in our strategy sessions throughout the year.</p>

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			and discussion around using a mobility vehicle with his current chair. In both cases, the patients had powered wheelchairs, one of which needed a repair in the on-site workshop, so I was able to see how the chairs are progressed from assessment to repair and back again.	design skills could be used to good effect for those patients who need a greater level of bespoke solution than is normally available. I spoke with my line management about devising a joint service on the back of this visit.	
5	6	C, D	19/3/19 – Departmental Meeting. This was the first of two departmental meetings in 2019. I presented an update on the recent changes within the Rehab Engineering department and the Quality Management System to all of the other staff in the department. Evidence Appendix D – Presentation slide	Whilst these are simple presentations and in limited detail, it provides useful practice in applying some of the presentation skills that I have observed in others.	Keep watching others present for tips
6	6	B	2/4/19 – ORLAU Departmental Strategy Session. The ORLAU senior team were joined by our Trust executive buddy, [REDACTED] to discuss where we want to go as a department. The senior team went over some ideas for expansion of the department and in particular the options available for us to expand.	It was useful to see how a Trust executive performs in such circumstances. I found [REDACTED] to push the question back on to us at most opportunities, which in some ways shows a high level of trust, but we also sometimes require an answer or approval, so such a tactic can prove frustrating.	Perhaps learn from [REDACTED] ability to 'turn the mirror', asking the questioner what would they do, rather than try to give an answer all the time. [REDACTED] it's an alternative approach that's

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					perhaps worth a try.
7	1, 2, 3	A, E	<p>17/4/19 – Developed 3D Live Sheffield. This is the UK’s foremost conference on Additive Manufacturing (AM) and a very thought-provoking event. I attended with a view to seeing the latest in CAD package technology and the keep up with the ever-increasing pace at which AM is moving forward. I had a chance meeting with a post-Doctoral engineer from the Manufacturing Technology Centre (MTC) who gave a presentation on Digital Twins in Manufacturing. Evidence Appendix E – Attendance badge</p>	<p>The exhibition was excellent, and the podium presentations were some of the most interesting I’ve ever seen at one event. I was lucky enough to sit in on a presentation about how finite element analysis is being used to virtually prototype the development of Brompton bicycles. This is a topic we have recently tried to use in ORLAU.</p>	<p>I hope to arrange a visit to the MTC and to Brompton bicycles using the contacts made today</p>
8	6	A, D	<p>13/5/19 – How we do business – ██████████. This was a presentation by our Chief Executive who outlined his plans to restructure the Trusts upper management and operations structure. The content was interesting but unlikely to have too much impact on me, so this was a good opportunity to observe his presentation style.</p>	<p>Our CEO is a colourful character, CEO by day but wedding singer by night. His presentation style is extremely open, honest and amusing to watch. He has an ability to capture the audience and I hope to one day be able to do something similar. It is clearly his level of confidence and knowledge that allows him to do what he does.</p>	<p>Try to bring that personal touch into a presentation, perhaps give a glimpse into the world of Keith Miller whilst I present.</p>
9	4, 6	B, C	<p>17/5/19 – QMS Management Review Meeting. This is a twice-yearly meeting where we discuss the effectiveness of the QMS. It lasts approx. 3</p>	<p>My lack of passion for the QMS probably prevents me from doing as good a job here as I ought to. I should probably look for</p>	<p>n/a</p>

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			hours and I never feel quite prepared for it, due to the amount and depth of content, despite my best efforts. Evidence Appendix F - Sample Agenda	opportunities to share the workload for this meeting and have others present certain aspects of it, so that I can focus on chairing it.	
10	6	C, D	Bi-monthly Rehabilitation Engineering Meetings. I chair and simultaneously minute the rehabilitation engineering meeting which takes place every other month. Chairing, taking minutes and contributing to a meeting is something I find quite difficult to do properly. Evidence Appendix G – Sample agenda	We have had quite a few discussions in ORLAU about how best to carry out our meetings, so far we have not come up with a different template/structure that we all agree would help.	I perhaps need to look at examples outside of the department and indeed the Trust to see if we can do things differently.
11	2, 3	A, B, D	12/6/19 – Manufacturing Technology Centre Meeting. On the back of the contact I made at the Developed 3D Live event, I was able to set up a meeting with him at their centre in Coventry. I attended with one of our Orthopaedic Consultants to talk about whether they can help us source a number of trusted new suppliers for our range of products. We had identified some time ago that our current group of suppliers have been helping ORLAU for many decades and are naturally coming to the end of their business [REDACTED]. I saw the MTC as being the perfect people to know the UK	We gave an overview of who and what we are and were introduced to a range of engineering and business development staff. This was one of those days that left me wanting to see more of what these people can do, so I suggested they pay us a visit to get a better understanding of what we do. This was the second time myself and our Orthopaedic Consultant had visited an engineering company in recent years and the dual pronged approach worked very well.	I'd like to seek out more opportunities such as this, if for nothing else but the knowledge and understanding gained of what others are currently doing.

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			manufacturing market and maybe they could help by putting us in touch with some like-minded contacts. Evidence Appendix H – Email communication		
12	5, 6	A, D	3/7/19 – RESMAG POIG Meeting. I've been attending the Prosthetics & Orthotics special Interest Group meetings for a number of years now. They are a sub-committee of the national Rehab Engineering Services Managers (RESMAG) meeting. I act as the Quality representative and feedback on the proceeding from the international standards committee for Prosthetics & Orthotics (BSI CH168) Evidence Appendix I - Minutes	This is a very useful meeting as it provides access to like-minded peers & professionals in other healthcare Trusts, in addition to regular access to representatives from the MHRA – this allows me to build up a relationship with them and is an opportunity to ask questions about topics such as the Medical Devices Regulations and the potential impact of Brexit.	I plan to continue in my current role with POIG
13	6	D	8/7/19 – [REDACTED] Masterclass. The UK's chief nurse came to RJAH Orthopaedic Hospital Foundation Trust to present a masterclass on her role.	This presentation was very focussed on the nursing profession, but I saw it as an opportunity to observe her presenting style. Strangely I could see she was not hugely confident, which in some ways helps me to feel slightly better about my presentation ability. This is not uncommon and perhaps I shouldn't be so down about my ability.	Take the positives that it's ok to not be an amazing presenter.
14	2	A	13/8/19 – [REDACTED], From MidTech - IP Presentation.	MidTech have since helped us to formulate an NDA with Ricoh to help develop our 3D printed lever and	This will help me understand IP better for future

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			I organised for [REDACTED] to come and talk to us as a department about Intellectual Property. This is a subject that most people don't fully understand, so the opportunity to refresh any knowledge I have would always be advantageous. [REDACTED] spoke about the different types of protection for ideas as it's not all about patents. Evidence Appendix J – Example presentation slide	have increased my knowledge to the point I feel more prepared for discussions with new suppliers	use, especially around prior knowledge and the release of certain information into the public domain.
15	2, 5, 6	B, D	21/8/19 – Visit to ORLAU by [REDACTED] of MTC. On the back of our previous visit to the MTC, their business development Manager came to ORLAU with a colleague to find out more about us. I gave a guided tour and detailed explanation of the difficulties we were about to face with our ageing supplier network.	This meeting turned out to be one of the proudest moments of my time in ORLAU. The MTC offered to not only help us find new suppliers but also to help us develop our Standing Frame to make it more attractive from a commercial & aesthetic perspective. They offered to undertake all of this for free as they could see we had little by way of resources, but we could provide much by way of publicity. A simple knock on a door had resulted in the most amazing offer from one of the UK's largest manufacturing R&D businesses.	This reminded me of the power of working for the NHS and even though we have scant resources, there are plenty of people and organisations that are willing to help.
16	2	A	9/9/19 – Procurement Drop-in session. Staff from our local Procurement hub were on site at the RJAH for a drop-in clinic to discuss any procurement issues that we might have. I	Getting a more in-depth knowledge of who does what in procurement has helped me to follow up subsequent queries with the correct	keep these relationships up to date as new personnel join.

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			went along to put faces to names and found it useful to talk about what they do after I raise an internal purchasing requisition. It's always enlightening to learn how others operate after you have completed your side of a package of work and this was no exception.	person, making things for them more efficient and having my queries dealt with more directly.	
17	4	B, C, D	9-10/9/19 – BSI Transition Audit for ISO 13485:2016. This was the second of our transition days to the 2016 version of the ISO 13485 standard. I guided our assessor through a detailed look at our entire system whilst he assessed how much we were adhering to the new aspects. The pressure was on for this day as any failure would lead to a temporary suspension of our certification due to the lack of time before our existing certification ran out. I was delighted to learn we had met the standard but had a number of minor areas to attend to, to be fully compliant. Evidence Appendix K – Email communication	This was the culmination of 2 years work and the sense of achievement at the end of the process was huge. I have lead responsibility for the Quality Management System with help from other staff members. None of us are tasked with solely QMS work, so fitting this aspect of my role into our other services can be an enormous challenge. There were times along this transition process when we questioned its merits, but the effort has been worth it in the long run.	This package of work has helped to remind me of just how resilient I can be.
18	6	C, D	12/9/19 – Visit by Lanyon Bowdler. I hosted a group of Solicitors from Lanyon Bowdler to visit ORLAU and see what we do.	This was an opportunity to present the work of our department and it gave me a refresher on the aspects of the unit I'm not normally involved with	I would happily volunteer to do this again.
19	5, 6	D, E	13/9/19 – Hosted [REDACTED] (Italian student).	Another great opportunity to present my work but to also how mechanical engineers are instrumental in	n/a

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			<p>██████ is a trainee clinical scientist from Italy, who won an Italian government backed, 3-month bursary with ██████ (our estates linked, medical device service/repair contractor). She came to me for an afternoon demonstration of what my life a clinical scientist is all about. I was able to show ██████ some of the bespoke developments that we have made under ISO 13458 and I helped her understand how it can be used to develop a better product. She was surprised to see the level of detail captured within our documentation and impressed by the lengths we go to, to evaluate a device for safety prior to it being released to the patient. ██████ gave me a brief overview of how clinical science works in Italian healthcare institutions.</p>	<p>mechanical/medical device development. Over the years, I have been able to tailor our service to get the best from my skills and that of my close team of technicians.</p>	
20	6	C, D	<p>18/9/19 – Health Service Awards Judging Panel. Hosted the Health Service Journal judging panel for a guide around ORLAU. The Trust was shortlisted for the annual Health Service Journal Awards and as a result a small group of judges was invited to come and see what the Trust does. I was asked by our chief exec to demonstrate the work of the department and similar to the previous two demonstrations above, I was happy to oblige. Having spoken with Solicitors and an Italian student, it was relatively easy to bring out the better aspects of our work and present them. Evidence Appendix L – Email communication</p>	<p>This was a heavily orchestrated visit against a very tight timescale. A colleague and I gave a whistle stop tour of the department, trying our best to show the more inspiring aspects of our daily work. I gave a somewhat nervous presentation as I was eager to make a good job of it, the speed of the visit made it difficult to cram everything in.</p>	<p>Slow down next time.</p>