

Newsletter

April 2021

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Committee Reports

President: Melissa Davidson

IOPTPWH Presidents Report

Kia ora from New Zealand. As we watch the 3rd and 4th Covid waves hit from here, we really appreciate how lucky we are that we are so far from everyone else and have a large 'moat' surrounding us and our nearest neighbors. Hopefully, this time next year the Covid vaccines mean life will return a bit to normal globally, however I think there will ongoing personal and professional effects for all of us.

WP Congress has just closed and while I only attended one live event due to the time zones involved (I do not function well from midnight to 4am!), having access for the next 3 months means we can catch up on all the events and presentations in our spare time at home wearing PJ's, snuggled up under blankets on the couch in front of the fire.

The one event I did attend, and Co-Chair alongside Heather, was the Networking Session for pelvic and women's health. We were very unsure how this would go having never done it before, however we had over 60 people from around the world attend and interact. Two sessions of 12 – 15min was not long enough to cover everything we wanted to discuss, and it certainly was not the same as in-person conferences. However, in this Covid world, it was lovely just to see and talk to people outside of our NZ bubble. We used new technology to help us interact.

We had a Padlet map we could place a pin on to indicate our country.

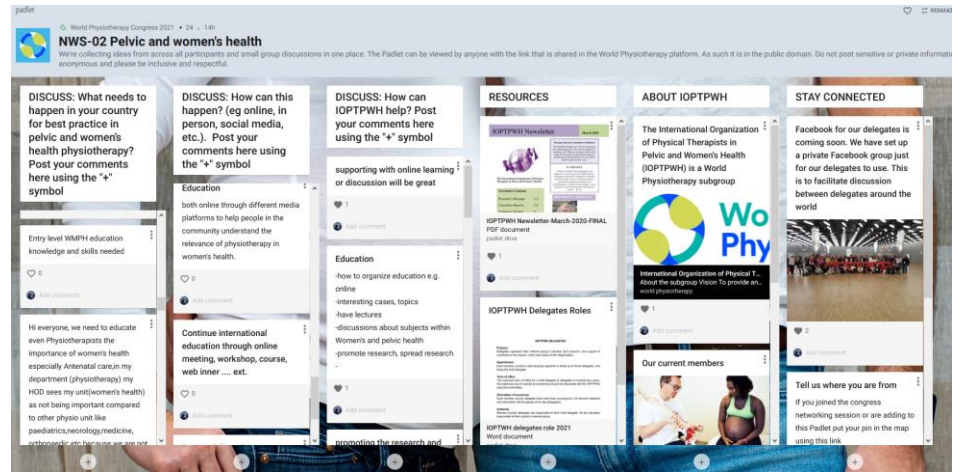


We were on group Zoom session (some attendee's screen shot below)



And we had a Padlet “white board” where we could place comments, questions, answers, suggestions, solutions etc like post-it labels.

This padlet is live until 8th July so go to <https://padlet.com/worldphysio/NWS02PelvicWomensHealth> to add your comments and read what others have written. We will take this information and place in a summary format to share to all.



The technology and the ideas shared have given us some new directions to consider. I borrowed the Padlet map idea to find out the location of NZ pelvic health physiotherapists and found there were more of us than I thought and spread out right across the country which is fantastic. Of course, we need more physiotherapists, more training opportunities, more awareness of pelvic health physiotherapists, and more funding – a quite common problem throughout the world according to our networking session.

The map below is a snapshot of our pelvic health physiotherapists in NZ taken in April 2021



I'm looking forward to meeting more of you in person hopefully in Japan in 2023, in the mean time we'll try and figure out a few more ways to stay connected.

Dr. Melissa Davidson

Vice President: Sonia Roa

This period has been intense in meetings and preparations for the activities of the recently held World Congress.

During this summer (for the southern hemisphere) I had the opportunity to represent our IOPTPWH in the subgroup meetings organized by World Physiotherapy, chaired by Emma Stoke. In these meetings the concerns and needs of all the subgroups are welcomed, being an important instance to share regarding common challenges and their possible solutions. During this period, we were also able to advance in the creation of our closed group on Facebook, which we hope will be an instance of communication with the delegates of each member country of our organization. We hope that this medium will be a contribution to communication between member countries. To be included, we hope that each delegate (registered as such in our database) requests their admission to the group on Facebook. Please find us as “IOPTPWH Delegates Private Group”, we will be waiting for you: you are welcome!

Sonia Roa Med, MPH

Secretary: Heather Pierce

As the pandemic continues across our world, in Australia we have returned to a new ‘normal’, as apart from international travel, most restrictions have been lifted. Melissa and I will soon be able to visit (in theory!), as New Zealand and Australia have agreed to a travel ‘bubble’. I am acutely aware that this situation is not the same for our international friends and colleagues. My thoughts and prayers continue to be with you. I sincerely hope as you read this report you, your families and colleagues are safe and well. If you are stressed with work or have experienced loss of family or friends, please accept a virtual hug.

Update of delegate details: Your action required!

Delegates! Please let me know of any updates to delegate status and contact details. You can view the information we have listed on your country on the World Physiotherapy website

<https://world.physio/subgroups/pelvic-womens-health>

For any corrections please email me at H.Pierce@westernsydney.edu.au

IOPTPWH Facebook Page

In addition to email, we will be using our Facebook page to communicate with our delegates and for delegates to access IOPTPWH newsletters, resources and the latest information on the group. *PLEASE NOTE: for administrative and privacy purposes the group is CLOSED, only available for MEMBER DELEGATES.* We therefore encourage our delegates to

provide generous and timely sharing of any information posted, to your own country's members through your own social network /email channels. For DELEGATE access to the Facebook group, please search for the group on Facebook and send a request to join.

<https://www.facebook.com/groups/1194604794222729/>

Executive committee meetings

The executive committee has held two 'Zoom' meetings so far in 2021: January and March. We have been busy with preparations for the Congress, and our attention now turns to finalising the updating of our constitution and governance documents, and responding to suggestions that arose during our networking session.

Membership

We have continued to receive several enquiries for membership, including from: Italy, Nigeria and Korea. It is encouraging to be contacted by physiotherapists from our global community, and to learn that there is a growing presence of women's and pelvic health practice in these countries. Those countries that are not at this time able to join as members will be included in our contacts as friends.

World Physiotherapy Congress 2021

We had a great time, and much positive feedback from our sessions in the World Physiotherapy Online Congress, 9-11th April. Our IOPTPWH networking session was chaired by Melissa and myself (although not long enough!), Annelie chaired the symposium on urogenital cancer, and I chaired the workshop on physiotherapy the maternity setting. Although there were limitations on our ability to communicate in an online setting, we were encouraged by your participation, interest and enthusiasm.

Workshop 'Physiotherapy in the Maternity Setting' session report

The workshop was very informative, and a great success! Although not confirmed, I believe we had over 40 participants in the live session. Our audience logged in at all times of the day/night from several different countries including: Belgium, Canada, Kurdistan Iraq, Vietnam, Germany, Brazil, Venezuela, Sweden, Norway, Kuwait, India, Nepal, Japan, Guyana, Costa Rica, Portugal, South Africa, Ghana, Nigeria, Finland, Columbia, Papua New Guinea, Indonesia, Slovenia, Kenya, Haiti, Latvia, and Madagascar!

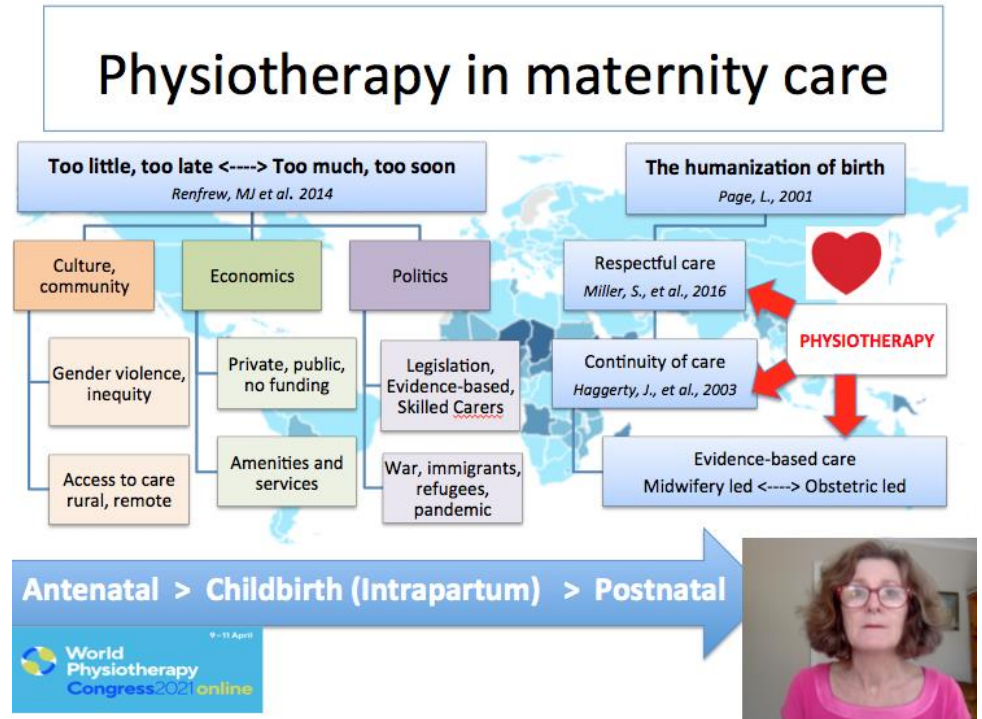
In my time zone the session was held at 11:45PM, but was well worth staying up for. Thanks to Sonia Roa, Annelie Gutke and Cristine Homs Jorge Ferreira for sharing their expertise and for the months of preparation in delivering the latest evidence on possible physiotherapy clinical management during pregnancy, labour and postpartum.

Our polls conducted during the live session indicated that at least 70% of the audience were currently treating women who were pregnant or soon after birth. Of interest, 7% work with women during labour as part of their clinical role. At the start of the session, 65% of our audience responded "yes" to the question "Do you think physiotherapists have a role working with women during labour?" while 31% were "unsure", and 4% said "no". At the close of the session the proportion of those that felt physiotherapists

had a role working with women in labour rose to 80%, while 13% remained “unsure”. This is an exciting to space to watch, considering the needs identified in Maternal Health research and the World Health Organization’s 2018 position statement on childbirth.



I am including in my report one of my introductory power point slides, for a snap shot of the session. The flowcharts depicted in the slide are my own summary of possible elements that provide challenges for women in accessing good quality maternal healthcare, and highlight the importance of physiotherapy in promoting the humanization of birth.



I am looking forward to working with you, progressing the ideas provided in our networking session, and exploring the role of physiotherapy for women in labour, to help improve access to good quality care and a positive birth experience, *for every woman, everywhere.*

Take care, Dr. Heather Pierce

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Member at Large: Annelie Gutke

The Appointed Project Group of education within pelvic and women's health has fortunately been able to keep up with our work despite the situation with COVID19. Let me first remind you of the main purpose of the appointed project group- 'to determine what IOPTPWH can do to promote education within physiotherapy in the field of women's and pelvic health worldwide'. Now, more than ever, this is a highly topical issue since most of the education and courses are cancelled when we cannot meet during the pandemic.

-Is it possible to learn how to evaluate and treat the pelvic floor without practical teaching?

This question is only one example among many that we have discussed during the group's meetings in the Autumn. At our meeting in October, we decided to work in subgroups for everyone to be heard and listened to. We needed to discuss more effectively and in depth.

Based on the skills and competencies of each member of the committee, two working groups were formed.

Group 1: with representatives from South Africa (Corlia Brandt), Israel (Netta Beyar), Finland (Valpuri Seikkula).

Group 2: with representatives from Brazil (Cristine Homs Jorge Ferreira), Ghana (Gifty Akushia Koomson), Latvia (Signe Bekere).

The subgroups have individually considered what the profile should be regarding **Knowledge and understanding; competence and skills; judgement and approach** of a *ground level educated physiotherapist* to treat common patients within women's and pelvic health physiotherapy, and what is needed as a *specialized physiotherapist* when seeing higher levels of complexity in patients. The group has also discussed if we could give recommendations or guidelines for teaching at different levels. Finally, we have discussed the need to consider the level of evidence for physiotherapy within pelvic and women's health. We are now in the phase of producing a draft for the EC to revise. Our goal is to form educational guidelines for pelvic and women's health physiotherapists and to use them to revise the position document already produced by IOPTPWH previously.

Dr. Annelie Gutke

Treasurer: Meena Sran

As of April 6, 2021 we have 17,427.72 GBP in the account.

Thank you to all member organizations who have their dues payments up to date. We know that 2020 was a challenging year. The 2021 request for dues has been sent out. The payment deadline is April 30, 2021.

We are carrying a larger than usual balance because of the cancellation of the in person WCPT conference.

Please remind your committees to update us when your chief delegate changes. We continue to send important information, including information about dues, to the chief delegate(s). It is your chief delegate's responsibility to forward the forms and request for dues to the correct individual who will make payment on behalf of your organization.

Thank you for your attention to this and for all your support.

Respectfully submitted,

Dr. Meena Sran

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Members Reports South Africa

Pelvic and Women`s Health Physiotherapy Group (South African Society of Physiotherapy)

<https://www.saphysio.co.za/>



The South African Journal of Physiotherapy

<https://sajp.co.za/>

The Pelvic and Women`s Health Physiotherapy Group (PWHPG) is a special interest group of the South African Society of Physiotherapy (SASP). We are a small but growing special interest group with approximately 230 members in the group, while the SASP have a membership of 4000-5000 physiotherapists. The group focus on all areas of pelvic health, including other areas of women`s and men`s health across the lifespan.

Our focus for the past two years have been to promote and develop the areas of men`s health and paediatric pelvic health, as women`s health has shown tremendous growth the past couple of years in South Africa. This year the focus is on transgender health care.

In order to support and promote our focus area each year, we present short webinars on the related topics while running social media campaigns. This is presented parallel with our postgraduate training modules, which are five modules running over four days. We are however currently restructuring these modules to a blended learning format to adapt to current circumstances.

During 2020 we ran a series of webinars on Men`s Health and Paediatric pelvic health while we had to put our face-to-face modules on hold due to COVID. However, these webinars improved accessibility and triggered a great interest in physiotherapists who did not know the area of pelvic and women`s health that well. We also run frequent journal clubs to promote evidence-based practice.



Photo 1: Bettina Moser lecturing at one of our post-graduate modules 2020.

We were fortunate to have speakers such as Corina Suracosa on pelvic health in children and patients with neurological disease. Jilly Bond also presented on the comprehensive approach to pelvic health. These presentations helped physiotherapists to understand the link between pelvic health and many systems in the body, and that pelvic health includes much more than `internal management`.

We also had a fantastic event where we collaborated with the Prostate Cancer Foundation of South Africa to raise awareness regarding men`s health matters. Emanating from this, was a couple of radio interviews and TV interviews with some of our committee members.



Photo 2: The PWHPG committee at the Men`s Health Matters event.

We also used the opportunity during the pandemic to reach out to the Nigerian Society of Physiotherapy, presenting a series of webinars for them over a six month period as a basic introduction to pelvic, women`s and men`s health. Forty of their physiotherapists attended and this collaboration is currently continuing to support their post-graduate training.

One of our members is currently running a big project to develop pelvic and women`s health in South Africa. This includes the integration of clinical, education, and research components to establish sustainable clinics accessible to the whole population.

The aim is also to make sure that all physiotherapists know how to use basic neuromusculoskeletal skills to manage these patients and to identify more complicated cases which needs referral to a pelvic and women`s health physiotherapist or other health care practitioner.



Photo 3: Joh-Ann Gouws doing a radio interview on vaginismus.

We are really seeing a growth in the interest in pelvic and women`s health physiotherapy. This is also evident in the increasing number of Master and PhD applications in this field.

In turn, this supports and address our current lack of research in a South African population. Gaining the evidence will also help us to make sure that these services are available and implemented at all health care levels. We would like to maintain the current growth in our membership by providing them the necessary training, resources and a wide spectrum of information they need to become good pelvic and women`s health practitioners. In addition to that, research is needed to support the needs of our own country.



Photo 4: Dr Corlia Brandt on the Health Talk TV show, talking about urinary incontinence in men and women.

Dr Corlia Brandt

Chair: Pelvic and Women`s Health Physiotherapy Group of the SASP

Message from the Newsletter Editor: Shirley Bustard

Thank you to those countries who have submitted articles to this newsletter, especially during these unprecedented times. I do hope that you and your families are safe and well. To help share the task of producing the newsletter, I will ask a different region every six months to produce articles. There is a template to assist with this and I am very happy to give advice. Please also share any news, resources, articles or links of interest. We will rotate through the following 7 groups and I look forward to receiving your submissions.

The World Physiotherapy Regions (and IOPTPWH group members) are

1. Asia/Western Pacific- Australia, Hong Kong, Japan, Kuwait, New Zealand, Saudi Arabia, and Singapore.
2. Africa-Nigeria, South Africa
3. Europe (1*) – Belgium, Croatia, Denmark, Finland, Germany and Ireland
4. Europe (2*) – Greece, Israel, Netherlands, Norway and Portugal.
5. Europe (3*) – Slovenia, Spain, Sweden, Turkey, United Kingdom
6. North America/Caribbean – Bermuda, Canada, United States of America
7. South America – Brazil and Chile

Shirley Bustard MSc.
IOPTPWH Newsletter Editor

We are absolutely delighted to be sharing a book chapter on the International history of pelvic floor rehabilitation which Jo Laycock PhD FCSP has kindly offered to us. We understand many delegates have assisted her with information about this worldwide historical chapter and she wishes to thank them for all their contributions.

We hope you enjoy reading it.

International History of Pelvic Floor Rehabilitation

Jo Laycock PhD FCSP

I am extremely grateful to all the physiotherapists around the world who responded to my request for historical information, and I apologise if I have missed-out any relevant information from your country. International history of pelvic floor rehabilitation is not only about 'people and dates', but a gradual change in practice due to a world-wide increase in knowledge and understanding, and evidence following meticulous research and publication; I have tried to reflect this.

Introduction.

Rehabilitation/re-education is designed to help individuals to regain skills and abilities that have been lost as a result of illness, injury or disease, or incarceration, restoring a disabled individual to maximum independence commensurate with his or her limitations (1). Other definitions exclude incarceration and include ageing (2).

The pelvic floor is composed of structures located within the bony pelvis, i.e., urogenital and anorectal viscera, pelvic floor muscles (PFM) and their connective tissues, and nerves and blood vessels (1).

Pelvic floor dysfunction (PFD) includes bladder and bowel dysfunction, pelvic organ prolapse (POP), sexual dysfunction, and pelvic pain (1) (3); many of these are multifactorial. Conservative management (restricted to nonsurgical and nonpharmacological approaches) (1) includes:

1. Assessment, including history and physical examination and investigations.
2. Diagnosis
3. Prevention
4. Treatment to improve function.

Assessment and investigations of the PFM includes: digital palpation, manometers, dynamometers, electromyography (EMG), ultrasound (US) magnetic resonance imaging (MRI) and urethral pressure measurements (1).

Treatment may include:

1. Muscle training; pelvic floor muscle exercises (PFME) performed on a repeated basis over an extended period of time to increase strength, endurance, power, flexibility or relaxation (1)(6)(7).

Training of any muscle involves the concepts of overload, specificity, maintenance and reversibility (4)(5) and may include biofeedback- the use of an external sensor to give an indication with regard to bodily processes, usually with the purpose of changing the measured quality. It is an adjunctive therapy (1). In addition, electrical muscle stimulation (EMS), the application of electric impulses directly to striated PFM to facilitate contraction, may be used (1).

2. Treatment using Manual Therapies, which is a clinical approach utilizing skilled specific hands-on techniques including vaginal, perineal and scar massage, myofascial release techniques, and myofascial trigger point treatment (TrP) (8)(9)(10)(11).

Historically, international development and advancement of knowledge of pelvic floor rehabilitation has been a gradual process and thanks are due to many organisations, including the World Confederation of Physical Therapists (WCPT) formed in 1953, and with the specialist organisation the International Organisation of Physiotherapists in Women's Health (IOPTWH), and all the world-wide Special Interest Groups (SIGs). Many of these organisations produce regular newsletters and arrange post-graduate courses and we are witnessing a rapid increase in evidence-based knowledge, which is easily shared, thanks to the internet. Furthermore, thanks to world-wide research by physiotherapists (PTs), PFM rehabilitation is now recognised by the medical profession. This has taken a long time due to a lack of evidence, and is still not acknowledged in some countries.

Historically, in addition to muscle training, **pelvic floor muscle assessment** has also developed (see below) and is necessary to identify the appropriate rehabilitation regimen. Furthermore, under-graduate and post-graduate education has developed internationally to meet the demands of a developing profession (see below).

This chapter looks at the International History of Pelvic Floor Rehabilitation. In addition, information gained following a request to PTs around the world for the following information is included:

1. Any ancient history in your country – religious or cultural – of Pelvic Floor Muscle Exercises (PFME); most probably connected with childbirth.
2. The year (approximately) when PFME were first practiced in your country. This could have been by midwives, nurses, physiotherapists, doctors or any other health workers.
3. The year (approximately) when PFME were included in the Physiotherapy/Physical Therapy training curriculum.

Ancient practices.

General exercises, often in the baths of ancient Greece and Rome, were recorded by Hippocrates and others, but it was not until the 18th. and 19th. centuries that the medical profession realised the value of exercises in rehabilitation.

To preserve and develop the perineal muscles, **Greek** physician Hippocrates tried oil injections, hot douches and salves (healing ointments) and **Greek** physician Soranus (AD 110) attempted support with the hand. Much information on ancient practices involving the pelvic floor muscles has been lost as religious and cultural practices were seldom recorded. In some countries, discussing 'women's' problems' is considered taboo. Historically, doctors were male and didn't even examine female cadavers, as it was considered inappropriate or

insensitive for a man to touch a woman outside a marital relationship. Most information around childbirth, the tissues around the birth canal, prolapse and incontinence, was passed on to doctors by midwives.

Some early exercises have been discredited including the practice of multiple ‘stop-start’ PFM contractions during micturition (17). Although sometimes still taught to this day, most PTs only use this technique as a single contraction to help their patients understand when they are performing the correct contraction. Squatting has long been considered the ‘natural’ position for defaecation and parturition, and is reported to strengthen pelvic ligaments and muscles in children (25). It is often included in ante-natal exercises as it is thought to be effective during hormonally influenced connective tissue remodelling.

In some areas of **South Africa**, it is reported that following childbirth, a woman had to live away from her husband until she could squeeze the local midwives fingers with her PFMs.

Australia. Traditional Aboriginal birthing practices in Australia (still practiced today in some areas) is governed by ‘Grandmother’s Law’ where women in the family support the pregnant woman. During childbirth, some Aboriginal women still want a squatting position over a depression in the ground, as ‘no one likes the shame of lying on their backs and spreading their legs’ (12). There was no mention in this article of pelvic floor muscles or any exercises.

Brazil/Latin America. Information regarding the indigenous people of the Upper Rio Negro region recorded no mention of the PFM; however, there is a big emphasis on being strong, and women were/are encouraged to do manual work so they would be strong enough to deliver their own babies. They carry buckets on their head and carry baskets on their back with a sling on their forehead. For all this work the women need good posture and this they learn from childhood. This is also the case in **Piro, Amazonian Peru**, where women work until the last day of pregnancy, and only ask for help with parturition (from female family members) with the first baby. After that, to this day, many still manage to self-deliver. In both these areas, the woman delivers in standing, legs slightly bent and hands on knees. The assistant, if required, stands behind with her arms around the armpits and pressing on the abdomen. In **Brunei**, there is a long tradition of PFME being taught by mothers to daughters as an adjunct to sex.

China. For thousands of years, Traditional Chinese Medicine (TCM) – acupuncture and Chinese medicinal herbs - has been used to treat pelvic disorders such as urinary incontinence. Rather than identifying a particular organ that is ‘unhealthy’, TCM sees the body as a whole and promotes the idea that a symptom can arise from an imbalance in the system; once the imbalance is corrected the body can work to heal itself.

India. Across different religions and cultures, numerous different techniques were/are practised, including Yoga, Siddha and Ayurvedic. In addition, massage with oil post-natally is thought to tone-up the PFM, abdomen, back and vagina. Pregnant women were advised not to squat; it is interesting that this contradicts ancient and modern advice in many countries, and they were advised to avoid cross leg sitting and to adopt long sitting to avoid injury to the pelvic floor.

Yoga. In ancient Indian textbooks, *Mula bandha* is mentioned as a yogic exercise for the perineum; Mula is the base of the torso, the perineum; in mula bandha, muscles are contracted at the centre of the perineum. Yogis also practised *Ashwini Mudra* to activate the sphincter muscles of the anus, and *Sahajoli Mudra* for females and *Vajroli Mudra* for males to strengthen the pelvic floor muscles.

Siddha Medicine. Eating various fruits, plants, grasses and roots was considered good for the pelvic floor during pregnancy and the post-natal period.

Ayurvedic Medicine. A 5000 year old Indian healing tradition included eating various fruits and nuts to treat incontinence, and also recorded in the ancient texts for incontinence are:

1. Stop urinating mid-stream and then re-start.
2. Have will power to control the urine and
3. Apply hot and cold bags on lower abdomen. Stopping and starting the flow of urine was also advised by the Maternity Center Association (MCA 1963) in the USA (54), but later discredited by Bump et al. (17).

Japan. Japanese (vaginal) balls, called ‘rin no tama’ , were recorded as far back as the 17th. century. These balls were around 1cm in diameter with a bell inside, which makes a noise when the body moves. When the woman shakes her hips the two balls in her vagina move, producing sexual arousal. They were also used as a form of contraception but there is no reference to the balls being used for PFM training. Another myth from Japan is the Western notion of Geisha Girls providing sexual favours. Geisha girls were trained to entertain with dance and music; they were not prostitutes and did not train their PFM to give pleasure to male clients.

History of PFM assessment.

Introduction

A contraction of the PFM in women produces an occlusion of the urethra, vagina and ano-rectum and a lifting of the perineum. However, these muscles are invisible to the patient, and even with a mirror, it may be very difficult for her to comprehend a correct contraction. Over the last 100 years we have seen advancement in detailed patient instructions, using terminology, models and diagrams that the patient understands. In crook lying with legs apart, during a maximum voluntary contraction (MVC), the following actions can be observed: the anus retracts, the perineum is drawn inwards, the posterior vaginal wall approaches the anterior vaginal wall and the urethral meatus ‘winks’. It is also important to record the skin condition around the perineum and upper thighs.

If a digital vaginal examination (VE) cannot be performed for any reason, observation and palpation of the perineum may demonstrate a correct contraction. Vaginal self-palpation is well described by Chiarelli (1989) (13); this technique is used as biofeedback to encourage greater effort.

An important part of an intimate examination is providing an explanation and reason for the evaluation and gaining patient consent. Due to our litigious society, over time this procedure has developed and now, in some medical settings, patients are offered the choice of bringing a chaperone along.

A further development is the improvement in hygiene standards, with disposable gloves and drapes, and single-patient devices available; it is recommended that a dated Infection Control Policy is in place, and regularly audited and reviewed.

In 1948 American Gynaecologist Arnold Kegel (14)(15) recommended palpation using the sensitive tip of the index finger to accurately vaginally assess the various components of the pelvic floor musculature. He maintained that using 2 fingers placed the vaginal tissues under tension and distorted the anatomical relationships. This premise was challenged by Chiarelli who maintained that a quick stretch of the muscle can produce an enhanced response (16). Kegel reported that only 30% of patients initially produced the correct PFM contraction. This low take-up was also demonstrated by Bump et al. in 1991; using urethral pressure measurements they reported that, after simple verbal or written instruction, only 49% of patients performed an ideal PFM contraction and 25% were actually performing a contraction potentially causing incontinence (17). This paper was a ‘wake-up call’ for many health professionals, although Kegel had discussed this 30+ years previously.

Early attempts at recording the result of PFM assessment often lacked flexibility and none incorporated standard muscle testing methods. To address this short-fall, Laycock and Jerwood **UK** proposed the **P E R F E C T** PFM assessment scheme: **P** represents power (or strength), **E** endurance, **R** repetitions, **F** fast, **E C T** Every Contraction Timed (18); vaginal palpation advanced from a quick ‘squeeze my finger(s)’ to a detailed evaluation of the right and left levator ani.

This scheme was not ‘perfect’ and one of the limitations was the use of the modified Oxford Scale to measure **Power** of both vaginal occlusion and perineal elevation (19). A revision of PERFECT to include **E elevation, C co-contraction and T timing** enabled recording of elevation, whether observed or measured. The Oxford scale and PERFECT has proved to be an inexpensive and popular addition to PFM assessment.

Possibly the first instrument to measure a PFM contraction was developed in **USA** in 1948 by Arnold Kegel; this perineometer involved a vaginal pressure probe connected to a dial where the patient and operator could observe the pressure produced by a PFM contraction (14).

Perineometry led to the benefit of biofeedback (see below). Later, in the 70s, with the use of perineometers incorporating electromyography (EMG), clinicians were better able to understand PFM fibre recruitment..

Assessment of the female patient with colorectal problems, and male patients with urinary and/or colorectal problems, by digital ano-rectal examination in side lying, follows the same lines as above, using the sensitive tip of the index finger, and has developed in the last 50 years. In addition, pressure and EMG ano-rectal perineometers are available, along with US imaging techniques. As PFM rehabilitation in most countries was

initially concerned with obstetrics and gynaecology, the male PFM may appear to have been neglected. However, pelvic trauma, radical prostatectomy and ageing may all impact on the male PFM leading to problems which may be ameliorated with PFM rehabilitation.

In teaching PFM awareness in children, the following techniques have been described: use of a mirror, surface perineal palpation and surface EMG, anal probe EMG, transabdominal and/or perineal ultrasound (21).

With technology moving at a pace over the last 70 years, a major breakthrough in the understanding of pelvic floor disorders has been achieved by the introduction of imaging techniques e.g. MRI into clinical research, and along with ultrasound (US) imaging, is nowadays increasingly utilised in research: however, the cost of these instruments inhibits their use in most physiotherapy clinical practices.

History of PFM training.

Introduction

Training the PFM using pelvic floor muscle exercises (PFME), also known as Kegel exercises, follow the same rules as for other muscles. Optimum muscle control involves the ability to not only maximally contract the PFM for strength training, but also to relax, where appropriate.

Pelvic floor muscle exercises have been incorporated for over 100 years in ante- and post-natal programmes in the **UK**, to strengthen the muscles adversely affected by pregnancy and childbirth (22). A systematic review and meta-analysis on the effect of ante natal PFME on labour and birth outcomes in 2020 showed that ante natal PFME may be effective in shortening the 2nd stage of labour and reducing severe perineal trauma (23).

In England 1894 four nurses interested in ‘medical gymnastics and massage’ formed the ‘Society of Trained Masseuses’. They were joined by other nurses and midwives, including in **1912**, Minnie Randell. Randell, working at St Thomas’ Hospital (London) with Dr J.S Fairbairn, a Fellow of the Royal College of Obstetricians and Gynaecologists, and later acknowledging the work of Dr Grantly Dick-Read, aimed to advance preventative obstetrics, by improving ante- and post-natal care. So began in the UK a long history of, amongst other things, pelvic floor muscle rehabilitation (22). As Minnie Randell was a teacher, and later Principal of The School of Massage and Medical Gymnastics at St Thomas’ Hospital, many of her students carried on this great tradition. After several title changes, the society became the Chartered Society of Physiotherapy (CSP). Randell, who advocated a PFM contraction associated with abdominal, gluteal and adductor contractions, was possibly the first clinician to teach the value of a strong PFM contraction before and during any activity that increased intra-abdominal pressure e.g. coughing, sneezing, bending and lifting a heavy object, to prevent/reduce urine loss. This advice was reiterated in a study from **America** (24) in 1998 using ‘The knack’, objectively demonstrating a significant decrease in urine loss with a cough.

Randell, working with Dr Kathleen Vaughan (who had worked in **Kashmir** and noticed the frequent use of squatting in childbirth and defaecation and many day-to-day activities, leading to less traumatic childbirth),

published advice for ante natal patients, including squatting exercises. They maintained that this would help to stretch the pelvic floor and so make parturition easier (22); Skilling and Petros in 2004 proposed that squatting would strengthen the PFM in children (25). Furthermore, Randell encouraged a modified squatting position, by using a foot stool in front of the toilet, when voiding and defaecating; this practice was re-introduced in the middle of the 20th century, especially for patients with constipation. Further early rehabilitation practices included perineal massage using olive oil ante-natally to stretch the perineum and post-natally to promote healing. A hundred years later (2020) a report on a meta-analysis of perineal massage concluded that given ante-natally it was associated with a lower risk of severe perineal trauma and post-partum complications (26).

Margaret Morris, a former ballet dancer and pupil of Randell, had also developed an exercise system aimed at pregnant women, and in 1936 she published in ‘Maternity and Post-operative Exercises’ the importance of the PFMs. She advocated that women should tighten the lower abdominal wall and brace the PFM on expiration. She recommended exercising the PFMs to music, in particular Schubert’s Waltz 16, no.2 (27). Helen Heardman (28) and Grantly Dick Read (29) toured America in 1947 teaching natural childbirth to physicians and nurses.

In **America** (1948) Green-Armytage discussed the use of physiotherapy in obstetrics and gynaecology, and quoted work by Stacey-Wilson 30 years earlier (30). In addition, in 1948, Kegel published articles on PFM re-education (14) (15) and has been quoted as a pioneer in PFM rehabilitation, despite the fact that PFMEs had been practised in the UK for the previous 50 years.

In the **UK** during the 20th century, many different methods of teaching a patient a PFM contraction were used. Some proposed that a PFM contraction should be done in isolation whereas others taught a PFM contraction with co-contraction of several other muscle groups, e.g. instructing the patient to: cross her legs, squeeze ankles and thighs together, pull-in abdomen and tighten buttocks, and pull-up the muscles between her legs as if stopping a bowel movement and stopping the passing of urine. Later in the 20th century, it became popular to incorporate co-contraction of the PFM with Transversus abdominus (TrA) – so called ‘core training’ (31).

In **Israel**, in the early part of the 20th century, ‘awareness through movement’, the so called Feldenkrais Approach, was developed, which enables a person to not only feel but also to analyse a muscle contraction, and was considered effective in pelvic floor re-education. Later, from **Switzerland**, came Cantienica, whereby a PFM contraction is palpated externally after movement of pelvic and hip joints. Later, PFME were increasingly incorporated into Pilates and yoga classes and continue to this day.

In other countries, PTs believed that attention to posture and gait would automatically have a PFM training effect. In addition, the Paula method, popular in the **Middle East**, theorised that activating other sphincter-like muscles e.g. the mouth and/or the eyes, would activate the PFM. Advances in measuring muscle contractions e.g.EMG, and muscle thickness and movement – US, has shown no activation using Paula or Feldenkrais, and no increase in muscle strength over time (34) (37).

Although PFM group therapy is not new, many countries have now published evidence that it can be effective in the treatment of incontinence (32), and work published from **Canada** also shows the benefits for treating the elderly with urinary incontinence (33). Randomised controlled trials (RCTs) with high methodological quality, systematic reviews and a Cochrane review have concluded that there is level A evidence that pelvic floor muscle training (PFMT) is more effective than no treatment, sham or placebo treatment for stress urinary incontinence (SUI) (37). Accordingly, PFMT is now considered the first-line treatment for SUI due to the low cost and few, if any, adverse effects (37).

Slovenia. Vaginal cones, introduced by Plevnik in 1985, now come in various shapes and weights. When inserted into the vagina, the feeling of losing the cone stimulates a PFM contraction, and this method is basically about retaining the heaviest cone against gravity while standing (35).

History of Biofeedback.

This technique aims to show a patient the result of their PFM contraction, to motivate and encourage adherence to an exercise regimen (36). It is extensively used for patients with bladder and/or bowel dysfunctions.

Kegel (14) first introduced the value of biofeedback with his pressure perineometer, and since then other vaginal/anal manometers, vaginal cones, dynamometry, EMG and US, have been developed in many countries world-wide. The basic form of biofeedback can be performed during vaginal/anal palpation and using a hand-held mirror may help some patients.

It is important when using any vaginal/anal device that the position of the patient and the probe is documented to enable repeat positioning for comparison with future biofeedback sessions. Breath holding and activity of other muscles is monitored/corrected as necessary. Biofeedback should be functional and progress from lying to standing and walking and any activity that is identified requiring PFM rehabilitation e.g. coughing for patients with stress urinary incontinence.

There are now Bluetooth-enabled devices using a smartphone, and several exercise apps, but to date, little research to support their claims. A systematic review in 2013 showed that there is not yet strong evidence that exercise regimens other than PFM training can reduce stress urinary incontinence in women (37). However, many women appreciate biofeedback and so, when available, biofeedback should be given as an option for in-clinic treatment and home training (37).

History of Electrical stimulation of muscle.

The effect of an electric current on the body is no new phenomenon. Early civilisations described shock-producing elements in the environment, such as electric fish and rubbed amber. In AD 76, **Greek** physician Dioscorides described the use of an electric fish in the treatment of prolapsus ani (38), perhaps the first report of electrical stimulation of the pelvic floor muscles. Artificially generated electricity had begun to find favour with

European physicians by the middle of the 18th century and the invention of the Leyden Jar in 1745 permitted the use of far stronger shocks. In spite of convincing testimonials of the therapeutic value of electric shocks, it was not until 1791 that published reports linked muscle contraction to electrical stimulation of nerves (39). In 1780, **Italian** physician Luigi Galvani observed that application of an electric shock to the leg of a frog induced a muscle contraction. Instances of Europeans using electric fish as a medical ‘shocking machine’ are to be found in the literature up to about 1850 (39). Medical electrotherapy equipment has continued to be developed around the world, with battery and mains machines now available. Galvanic currents, Faradic currents, Interferential Therapy and currents with varying electrical parameters flooded the market in the 20th century.

The history of our knowledge on the effects of electrical muscle stimulation (EMS) has also progressed. The excitability of nerve and muscle tissue provides the basis for the therapeutic use of electrical stimulation. When an electrical stimulus is applied to a peripheral nerve, motor, sensory and autonomic fibres are excited, if the parameters of the stimulus meet or exceed the thresholds of excitation for those individual fibres. However, opinions differ on these exact parameters for maximum benefit of neuromuscular electrical stimulation (NMES). Electrical stimulation of the pelvic floor produces a reflex contraction of the levator ani and urethral and anal sphincters, accompanied by a reflex inhibition of the detrusor muscle, thus helping in the rehabilitation of patients with stress urinary incontinence due to weak PFMs, and an overactive bladder. This effect depends on a preserved reflex arc through the sacral micturition reflex centre. Consequently, total or partial peripheral innervation of the pelvic floor muscles is a prerequisite for a therapeutic effect.

Historically, PFM maximal EMS (up to 120mA) was supplied in-clinic, 2 to 3 times a week, for 4 to 8 weeks, the so-called ‘short-term acute maximal stimulation’. With the advent of home units, it is now possible to prescribe daily treatment; this can be maximal (as above) or ‘chronic low-intensity stimulation’ delivering a low current amplitude at a low frequency (5 to 10Hz), over a period of 4 to 12 months. However, the literature often fails to define the modality and parameters used, and the term EMS has been used indiscriminately.

In the early and middle 20th century, faradism was used effectively in treatments broadly classified as ‘neuromuscular facilitation’, in which a patient’s voluntary response is supplemented with various motor and sensory stimuli (40). Not uncommonly, one or two short ‘facilitation’ sessions using faradism with patients who initially demonstrate a poor or absent voluntary contraction of the PFM, can help them to produce a voluntary response of functional force. Thus, by supplying the sensory input of what a desired muscle contraction feels like, electrical stimulation can greatly augment a motor response by a patient who has neural integrity to perform the task but lacks efficiency in voluntary programming. As technology progressed, faradism was replaced by currents producing less discomfort using better designed vaginal and anal electrodes, and this neuromuscular facilitation of the PFM is well tolerated by most patients.

In 1967, Moore and Schofield **Manchester UK** described maximal PFM activation by electrical stimulation under anaesthesia. Four to six maximal tetanic contractions were produced using Faradism and external electrodes. Of 18 cases treated, 33% were completely relieved and 22% were much improved (41).

Patterned Neuromuscular Stimulation, (as opposed to set uniform parameters), so called Eutrophic stimulation, was developed in **Manchester, UK** in the late 1990s which claimed to reduce fatigue and produce a more physiological pattern of electrical impulses (42).

With modern technology, these machines are getting smaller and smaller, and many can be used for home treatment. **Slovenia**. The first automatic vaginal electrical stimulator was designed by Suhel in 1975 (43). Since then EMS has been routinely used for the treatment of female urinary incontinence, and Slovenian institutes have continued to develop this treatment both in Slovenia and also abroad.

In addition, over the years, thanks to multi-disciplinary research from several countries, more is known regarding the action of EMS, and there are at least three further theories.

One theory from **America** proposes that augmentation of a PFM contraction using vaginal/anal acute maximum stimulation (the patient 'joins in' with the stimulation) occurs in a similar way to voluntary exercise by repeatedly eliciting a maximal (or near maximal) PFM contraction (44). Most studies have investigated the quadriceps femoris muscle, and as the quadriceps and levator ani are both composed of a mixture of fast- and slow-twitch muscle fibres, it is postulated that similar physiological effects will be produced by electrical stimulation of the pelvic floor muscles.

The second theory from **America** (45) proposes that EMS at an appropriate high amplitude and frequency (30 to 50Hz), augments muscle strength by targeting the Type 2 fast-twitch muscle fibres (responsible for speed and strength).

The third theory from **Germany and England** supports the concept that chronic, low frequency (5 to 10Hz), low intensity stimulation may modify the physiological and metabolic characteristics of normal muscle and muscle atrophied by disuse (46). The chronically stimulated muscle assumes properties similar to a muscle with slow motor units. This suggests that this would benefit muscles with predominately slow-twitch properties e.g. facial muscles.

Electrical activation of nerves supplying the PFM using surgically implanted sacral nerve electrodes has progressed during the last 50 years in sacral neuromodulation patients. Fine tuning of electrode configuration can now be used to assess the activation of the different parts of the PFM (47).

The development of vaginal and anal electrodes in the late part of the 20th century has produced units which are lighter and can therefore be used in standing. They are more comfortable to insert and use, and designed to adapt to the vaginal/anal contours and so supply a steady more comfortable current.

The last 50 years has seen great advances in hygiene and infection control, and the development of single patient electrodes for electrical stimulation and biofeedback and other vaginal devices; these have generally replaced the need to sterilize multi-patient equipment in physiotherapy.

Conservative management of PFD is now multidisciplinary and may be provided by clinicians or practitioners of different disciplines; commonly physiotherapists/physical therapists, nurses, midwives, and medical doctors.

However, other professions, e.g., yoga and Pilates instructors, fitness instructors and personal trainers, may also play a role in education, health promotion and prevention of PFD. A multidisciplinary approach refers to two or more disciplines that are usually considered distinct e.g., physical therapy, gynecology and urology (1).

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The year (approximately) when PFME were first practiced.

<u>Country</u>	<u>Approx. year PFME started</u>	<u>International collaborators</u>	<u>Further information</u>
Australia	1980s	Pauline Chiarelli	Published 'Womens' Waterworks' which was translated into 55 different languages.
Belgium	Early 70s	Marcel Cauffriez	Developed a dynamometer.
Bermuda	Mid 80s	Shirlene Dill	Self-taught from books.
Brazil	Early 2000s		
Canada	Mid 70s		Canadian Continence Foundation formed in 1986.
Chile	1995	Bernardita Fuentes Vejar	2003. Chilean Society of Pelviperineal Kinesiology – SOKIP was formed.
China	1981	Doctors following training overseas.	Service now provided by nurses.
Colombia	Early 2000s	Dr Yves Castille + Ligia D Barreto (PT)	2020. Colombian Association of Pelvic Floor PTs was formed.
Costa Rica	2000	Licda Leticia Rojas & Sylvia Alfaro	2001 National Congress of Kinesiology
Democratic Republic of Congo	2009		PFME started post fistula surgery.
France	1977	Alain Bourcier	1985. Post-natal rehab. reimbursed by National Health Insurance Fund. Now by CNAM.
Germany	1930 1963		Midwives trained but not specifically PFME PTs started PFME
India	1950s 1959/60	Obs +Gyns + PTs practiced PFME Vittal Rao introduced PFME following a course in the UK.	Included in PT curriculum 1997. Master in PT (OBG)
Israel	1957 1990 1995	PTs	Childbirth classes. PFM dysfunction included 1 st . professional post-grad. Course
Japan	1966 1969		Translation to Japanese of 'Maternal Rehabilitation' from Helen Herdman's Obstetrics and Gymnastics. + Physiotherapy in Obstetrics by Maria Ebner.

Kurdistan	2006	Begard Othman Muhammad	First Ante natal classes.
Netherlands	1926	T H van de Velde	Publication of 'Ideal Marriage'
	Mid 1940s	Dr Kloosterman & Bep Reesink	Pre- and Post natal care.
	1981		Dutch Society for Physiotherapy in Pre- and Post-natal Health Care founded.
	1994		Foundation of Dutch Association for Pelvic Physiotherapy - NVFB
New Zealand	1938	Mrs Dufaur	Using Margaret Morris's (UK) approach to Maternity Exercises
Norway	1947	Prof. Jorgen Lovsett	Maternity Gymnastics.
	1985	Kari Bo	Introduced Incontinence Courses
South Africa	1960s		PTs and midwives provide treatment
Spain	1970s	Olga Ruiz	Ante and post natal classes.
Switzerland	1970	Jean Felix	Kegel exes. + faradism.
	1990	Thierry Dhenin (President)	Association Suisse des Physiotherapeutes Specialises en Uro- Gynecologie ASPUG was formed.
Turkey	1969		
	1972	Hacettepe University	PT and rehab. clinic in women's health
UK	1912	Minnie Randell & Dr S Fairbairn	Preventative obstetrics.
	1949		Obstetric Physiotherapy Association - OPA was formed.
USA	1930	Van de Velde	Ideal marriage published
	1946	Scott & Van Wyck	'The Essentials of Obstetrics and Gynecology' was published.
	1948 1977	Arnold Kegel Elizabeth Noble	Published papers on 'Kegel Exercises' . PT section of APTA formed.

Table 1. Approximate year when PFME were first practiced.

The inclusion of PFME in the undergraduate physiotherapy training curriculum and further education.

To this day, in many countries, the addition of Women's' Health to the undergraduate curriculum is dependent on the decision of the individual training school and is not included in all schools. In the 20th century, many schools were located in hospitals and awarded a diploma in physiotherapy. Training was later up-graded to a degree, awarded by a University. In the **UK**, physiotherapy schools became part of universities in 1992, and to date there

are 51 universities delivering physiotherapy pre-registration education. Not all include a Women's Health module.

A Faculty Survey on Women's Health Curricular Content in Entry Level Physical Therapy **USA 2016** reported a 64% response rate from 200 accredited entry-level PT programs. The aim was to assist a Section on Women's Health (SoWH) task force in developing a guideline for women's health content in entry-level physical therapy curricula (48).

In addition, an education guideline (2018) was published by the Physiotherapy Committee of the International Continence Society (ICS) which aimed to provide a guideline for educators creating learning programs, to enable recognition of education level and to set educational goals. They proposed 3 levels: Pelvic Physiotherapist Level 1 which includes a basic digital vaginal examination and ability to treat patients with SUI, overactive bladder (OAB) and pelvic organ prolapsed (POP) and to recognise the need to refer to a more skilled PT or other specialist. Physiotherapist Level 2 and Level 3 include knowledge of urinary, bowel and sexual problems in all populations, and examine, evaluate and treat thoraco-lumbo-pelvic disorders (49).

In **Canada** 2019, the Canadian Council of Physiotherapy University Programs (CCPUP) produced a competency profile to inform the revision of previous guidelines and includes:

Statement of Entry to Practice

7 domains of practice

34 essential competences

140 entry to practice milestones (50).

Most countries have established a system whereby post-graduate education in PFM rehabilitation is available; this may be from an education establishment e.g. university, or a validated special interest group. Different post graduate curricula reflect the individual faculty providing the education e.g. how PFM vaginal palpation is taught and tested, vaginal examination (VE) of the pelvic floor muscles was not practiced or taught to physiotherapists in many countries until the middle of the 20th century. There is ongoing discussion on the best way to teach/learn VEs to physiotherapists, varying from agreeing to examine and to be examined by a peer group member on a post graduate course, examining a woman (paid to be a model), on the job under supervision, or under the supervision of a gynaecologist. The general consensus of opinion in the **US** favours NOT including external/internal vaginal examination in undergraduate education, or in entry-level Doctor in Physical Therapy (DPT) (51)(52). Other countries are more open to this topic and many post-graduate students in Women's Health select a training course to suit their preferences in the teaching/learning of vaginal examinations.

The future

Researching the most clinically effective and cost effective method of delivering PFM rehabilitation is an on-going consideration in many countries, with public health services facing workforce shortages, increasing costs and increasing demands, and innovative patient pathways are vital to meet patient needs. A study from **Australia 2019**, reported on the development, implementation and evaluation of an advanced practice in continence and women's health physiotherapy model of care (53).

The future looks rosy, with new projects on the horizon, including a working group made up of representatives from ICS (host), AUGS, IUGA and SUFU. This partnership will produce a major core terminology report entitled: Terminology for Female Lower Urinary Tract, Pelvic Floor Function and Dysfunction. A truly multi-disciplinary, international project.

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In some sections it has only been possible to include information provided – some of it anecdotal – and so inaccuracies and omissions are likely. If anyone can provide any omissions and/or corrections, please contact the author. laycock.culgaith@btinternet.com

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