Drastic increase of microsampling use during the COVID-19 crisis.
By Herman Veenhol

The potential of the IATDMCT Scientific Committees
by Stein Bergan

Drug use in America determined by urine drug testing. Is a Gabapentin crisis next?
by Amadeo Pesce and colleagues

Memorandum of Understanding for Collaboration between IATDMCT and ACCP signed
by Salvatore J. Salamone

Paclitaxel TDM Level 1 Evidence: Personalizing Therapy to Reduce Toxicity while Maintaining Efficacy
I hope that you are continuing to stay safe and healthy during this difficult time. We have all had extremely unusual experiences and sudden changes in our daily life and working/studying circumstances due to the COVID-19 pandemic. At the same time, I sincerely thank all medical and laboratory professionals for their devoted efforts to fight the virus and care for patients.

Even in this challenging situation, I am pleased to see our IATDMCT colleagues demonstrate their expertise to contribute to medical service and public health. For example, the Immunosuppressive Drugs Committee has published a timely article in our TDM journal to alert clinicians on potential drug interactions with experimental COVID-19 treatments in transplant recipients. As discipline of TDM and CT, every member can do something, even small things to support people.

Please use your knowledge, skills and accumulated experiences. Although the Banff Congress this September was forced to cancel sadly due to the COVID-19 pandemic, I look forward to the near future when we can meet together discussing science and exchanging activities.

"There is always light behind the clouds." (Louisa May Alcott)
Drastic increase of microsampling use during the COVID-19 crisis

By Herman Veenhof, PharmD, PhD, Department of Clinical Pharmacy and Pharmacology, University Medical Center Groningen, The Netherlands. On behalf of the Alternative Sampling Committee

The current COVID-19 pandemic has skyrocketed the use of microsampling in our hospital, the University Medical Center Groningen (UMCG), The Netherlands. In the seven weeks before the start of the social distancing measures on March 9th, we received a total of 5 Dried Blood Spot (DBS) samples from transplant patients for immunosuppressant TDM. In the seven weeks after March 9th, we received a total of 124 DBS samples (see Figure 1).

Solid organ transplant patients receive life-long immunosuppression in order to protect them from organ rejection. These immunosuppressive drugs are subject to TDM. Because of this, transplant patients are used to frequent visits to the hospital for venous blood sampling. For transplant patients, there is an increased risk of experiencing severe symptoms if infected with COVID-19 [1]. Therefore, routine clinical consultation in our hospital has been cancelled in accordance with the Dutch social distancing measures. Venous blood sampling for TDM purposes is therefore not carried out in our hospital and blood sampling in a local phlebotomy center is not preferable and sometimes not possible.

In the UMCG, the DBS-method for sampling at home using fingerpick blood was introduced in 2016 [2]. Due to logistical problems, the DBS method was not used very much in the past months [3]. A pilot to improve the logistics was about to commence when the COVID-19 pandemic started. However, there was no time to carry out this pilot since the standing DBS method was the only option to perform immunosuppressant TDM and measure creatinine in the same sample at that time [2]. Therefore, we sent patients with no DBS sampling experience a DBS sampling kit and asked them to carefully read the instruction and watch our instruction video [4]. Based on previous experience, we expected many DBS of insufficient quality to be sent in by our patients because we previously found that untrained patients who only receive a written instruction can produce up to 44% insufficient quality DBS [5]. However, we were pleasantly surprised that only 18 out of 124 samples were of insufficient quality, leading to a success rate of 85.5% (Figure 1). This is quite good, since well-trained patients produce up to 95% sufficient quality samples in our hospital [3].

In conclusion, the development of our DBS service has allowed us to safeguard the care of our transplant patients. Further development, improvement and implementation of microsampling assays for patient home sampling can become essential, especially if this crisis will continue for the time to come.

Figure 1: Amount of Dried Blood Spots (DBS) samples for immunosuppressant TDM received and analyzed at the laboratory of the University Medical Center Groningen (UMCG), The Netherlands during the COVID-19 pandemic.

REFERENCES
The potential of the IATDMCT Scientific Committees

By Professor Stein Bergan, Dept. of Pharmacology, Oslo University Hospital & Dept of Pharmacy, University of Oslo, Norway.

On behalf of the Immunosuppressive Drugs Committee

Log on to the IATDMCT website, head over to the Scientific Committees tab, and check the list of members in these committees. What an enormous resource of competence, skills, and experience in the fields of TDM and clinical toxicology. Myself I am a member of the Immunosuppressive Drugs Scientific Committee (ISD SC), currently the chair of this committee. Performing a search in PubMed I find 28,000 citations where one or more member of the ISD SC is a co-author. Among those papers, more than 400 were published in the TDM journal (an approximate, quick, and dirty PubMed search by April 2020). Now the ISD SC is the largest one in terms of members, currently around 35. In the recent years, this committee has managed some large tasks, a recent example being the publication of the consensus report on TDM of tacrolimus [Ther Drug Monit. 2019;41(3):261-307 PMID 31045868], led by the former chair Mercè Brunet. All members were invited to contribute, and the list of authors counted 37 names. Although this includes experienced authors and supervisors, one can imagine the efforts needed to organize such a project.

Recently, members of the ISD SC also collaborated to prepare a paper which provides recommendations for TDM of immunosuppressive drugs in transplant recipients infected with SARS-CoV-2 [Elen et al, Ther Drug Monit. 2020 Apr. PMID 32304488]. This manuscript was prepared, submitted, reviewed, and published ahead of print within four weeks. When the suggestion to write this paper came up (in fact following the invitation for a contribution from our scientific committee to this edition of the Compass) the idea was immediately supported by several members and it turned out that some members had already prepared something similar for internal use in their own institutions or nationwide. The urgency in this initiative prohibited involvement of the complete list of committee members, and it ended up with a group of eight members who co authored the paper.

Why am I boring you with the details on how these papers came about?
- As I see it, these experiences illustrate the potential of what can be obtained using the scientific committee as a base, but also some dilemmas.
- The potential of collaboration in the scientific committee is obvious. Here we have a group of colleagues from all continents, enthusiastic about their respective roles and the aspects of TDM and personalized pharmacotherapy plus personal relationships between members after having convened in symposia and congresses over the years. So, the environment for collaboration seems perfect. We can produce guidelines, consensus reports and recommendations for our field. There are also initiatives to further develop educational resources that can be provided or endorsed by the IATDMCT, and we could list further challenges for the scientific committees.

Are there really any dilemmas with this, isn’t it straightforward? Well, at least I see some room for improvement; what we could do to facilitate the work in the ISD SC. All members are busy, involved in development of the lab, clinical routine, administration, teaching, research, other national or international fora, etc. So, the ‘system’ and organization of projects in the scientific committee must be efficient and sustainable for follow up by the members. As an example, until now the nearly 40 members of the ISD SC communicate via emails, ‘reply-to-all’ type, which is not very effective. Some limitations appeared for this alternative, but hopefully these are now being resolved so that we can take advantage of the obvious benefits from this communication form rather than the ‘reply-to-all’ emails.

Another kind of dilemma arises when the committee has reached a certain size. On the one hand, we sincerely welcome all members who have interest in the field of immunosuppressive drugs to join this scientific committee. On the other hand we must maintain ‘democracy’, keeping everyone updated on what is going on, including initiatives for collaborative papers and suggested symposia in order to give all the members the opportunity to participate and contribute as much as they want. At the same time, for papers to be published we also need to respect the Vancouver rules for authorship.

When it comes to publication, although there may not be formal restrictions, many of us would feel that for a paper organized via a scientific committee of the IATDMCT, the paper should be published in the TDM journal, which is the official journal of our association. Some would argue that for selected manuscripts they would aim for a journal with higher impact factor, or that in some cases they have experienced too long time for review in this journal. We should keep in mind that these are factors that we can improve ourselves, by submission of high-quality manuscripts and also by accepting to review manuscripts whenever we find time, and to respond quickly. One bonus to be aware of is that according to an agreement between the association and the publisher, papers that are published from the IATDMCT will have open access for full text -which can imply that we reach a much wider range of readers.

Moreover, we must be aware that among our members there are (fortunately!) already groups that collaborate on various topics including comparison of assays, clinical trials, original and review papers, as well as application for funding of larger activities. Some of these projects might have benefited from a broad collaboration between committee members, but for many this would not be optimal or even possible. Obviously, the ISD SC should not be involved in cases where it probably would slow down the process and not contribute anything extra. The important message here is that all members should be aware of the options and consider what would be the best approach already when launching a new idea or initiative.

Currently the ISD SC has embarked on a new project, a consensus report on mycophenolate personalized therapy. Again, all members of the ISD SC have been invited to participate, and it will be a challenge to combine all contributions and edits into a hopefully high-quality paper. So far,
Chemotherapy drugs are prime candidates for therapeutic drug monitoring (TDM). The first-generation taxane and mitotic inhibitor paclitaxel is one of the most widely used chemotherapy agents, with approximately 800,000 patients worldwide being treated with the drug each year. The exposure-toxicity relationship of paclitaxel has been described by threshold models, whereas the time above a paclitaxel plasma concentration of 0.05 µmol/L (TC>0.05) predicts hematological and non-hematological toxicity. The most important and dose-limiting toxicity in patients receiving 3-weekly paclitaxel include severe neutropenia and cumulative chemotherapy-induced peripheral neuropathy (CIPN), the latter resulting in potential severe limitation of daily activities and quality-of life. Genetic polymorphisms and several other covariates (sex, BSA, and age) have been shown to affect the elimination capacity of paclitaxel. Real-time PK information may be able to guide optimum patient dosing of paclitaxel, maximizing dose delivery and potential efficacy whilst minimizing toxicity.

As with many chemotherapeutic agents, the pharmacokinetics of paclitaxel exhibit high interindividual variability and dosing based on body surface area (BSA) is inadequate to reduce PK variability, resulting in a high risk of toxicity or lack of efficacy. Following initial BSA-based dosing of paclitaxel chemotherapy, individual patients rarely have doses increased to achieve an intra-patient maximum tolerated dose (MTD) due to concerns over the potential of severe side effects. Other patients may also be receiving excessively high doses. As a consequence, many patients may not be receiving optimal paclitaxel exposure, supporting the conclusion that BSA-based dosing of paclitaxel is of limited value and a different approach is required.

Based on this information and a previously reported paclitaxel dosing algorithm, two prospective, randomized phase 3 trials in patients with advanced Non Small-Cells Lung Cancer (NSCLC) on 3-weekly paclitaxel in combination with carboplatin or cisplatin (CEPAC-TDM) were conducted in Europe and China. In the field of oncology, TDM two phase 3 randomized studies is unprecedented and represent only the third and fourth phase 3 randomized oncology TDM studies ever reported.

The results of these studies demonstrated that current methods of dosing using BSA are ineffective, leading to wide pharmacokinetic variability and that most patients are given supra-therapeutic doses of paclitaxel. By using TDM, toxicities were significantly reduced without affecting, and in some cases improving, efficacy.

**Prospective, randomized phase 3 trials in patients with advanced NSCLC**

In the first reported study, patients with newly diagnosed NSCLC were randomly assigned to receive up to 6 cycles of 3-weekly standard dosing with paclitaxel at 200 mg/m² with cisplatin 80 mg/m² or carboplatin AUC 6. Arm A received standard treatment and primary G-CSF prophylaxis was not allowed. Growth factor was administered in patients experiencing prolonged (>7 days) grade 4 neutropenia or febrile neutropenia. In Arm B the initial starting dose of paclitaxel was based on BSA, age and sex and subsequent doses were based on neutropenia and previous-cycle paclitaxel TC>0.05 to adjust to a target range between 26 and 31 hours. Paclitaxel and/or platinum doses were reduced in both treatment arms according to hematological and non-hematological toxicity. A total of 386 patients were enrolled of which 365 were included in the intention-to-treat analysis (arm A, n = 182; arm B, n = 183). The study measured paclitaxel in patient plasma using a limited sampling strategy requiring only a single blood sample. The concentration was determined by HPLC and the T<sub>C<0.05</sub> was calculated using the NONMEM PK software program. Noticeably, PK (using a HPLC method) was followed only in the TDM arm. By the final treatment cycle the mean dose in the TDM arm was 25% lower (139 mg/m²) than in the standard arm (186 mg/m²). PK-guided dosing reduced the proportion of patients with supra-therapeutic doses from 38% in cycle 1 to 2% in cycle 6. The dose adjustment algorithm described in the protocol was effective. By the
sixth cycle the percent coefficient of variation (CV%) of the doses needed to achieve target levels in the TDM arm was 26% while the CV in the standard arm was 10% indicating less dose adjustments. Most patients in the TDM arm did receive dose adjustments according to target $T_{C>0.05}$, described as 28.8 hours in the first cycle and 24.6 hours in the last cycle 19.

In terms of toxicity there was no significant difference in neutropenia between arms A and B (19% vs 16%) (Figure 1A). There was a significant difference in the reduction of neuropathy between arms. Neuropathy grade $\geq 2$ was reduced from 38% in arm A to 22% (p=0.001) in arm B and grade $\geq 3$ was reduced from 9% in arm A to 2% in arm B (p=0.001) (Figure 1B). The cumulative hazard for $>2$ neuropathy was 0.59 and the reduction in arm B was consistent over all patient subgroups (Figure 1C) 19.

Given the significant dose reduction in the TDM arm there was not significant difference in overall response rate (ORR) or progression free survival between the arms. The adjusted overall median survival between the arms A and B (10.1 months versus 9.5 months, p = 0.682) was also not significant 19.

In the second randomized trial, patients were randomized to receive 4 cycles of 3-weekly paclitaxel at a starting dose of 175 mg/m² with carboplatin AUC 5 with either standard treatment in arm A and TDM in the other arm B 20. The target range ($T_{C>0.05}$ between 26 and 31 hours) and the algorithm defined by Joerger et al. was followed for dose adjustment. A total of 319 patients were enrolled with 164 in arm A and 155 patients in arm B. The concentrations were obtained using the MyCare Immunoassay and the $T_{C>0.05}$ was calculated using the MyCare dose Adjustment Calculator. In the first cycle the BSA dosing resulted in 89% of the patients receiving supra-therapeutic exposure levels ($T_{C>0.05} > 31\, \text{h}$) and by the last cycle 96% of the patients in the TDM arm received dose reductions. By the final treatment cycle the mean dose in the TDM arm was 24% lower (115 mg/m²) than in the standard arm (155 mg/m²). In patients completing all 4 cycles only 18% of the patients in the PK-Guided arm were above the therapeutic range versus 78% of the patients being above the therapeutic range in the standard arm (p=0.0001) (Figure 2) 20. PK guided dosing showed significant reduction in grade 4 hematological toxicities (15 vs 24%, p = 0.009) and grade 4 neutropenia (15 vs 23%, p = 0.009) resulting in a cumulative hazard of 0.57 and 0.59 respectively (Figure 3A and B). The PK guided dosing arm also reduced the cumulative incidence of grade $\geq 1$ neuropathy from 66 to 52% (p = 0.033) and the incidence of grade $\geq 2$ neuropathy from 8 to 2% (p = 0.005) (Figure 3C and D) 20. The objective response rate (ORR) between the two arms were not significantly different with 26% ORR for the standard arm and 32% in the TDM arm. Progression free survival was slightly improved in the TDM, with 4.17 months for arm A and 4.67 months for arm B (p = 0.026). Overall survival was not significantly different between arm A and B with 24 months and 21 months (p = 0.815) 20.

---

**Fig 1:** Comparison of chemotherapy-related toxicity between study arms. (A) Time to grade 4 treatment-related neutropenia (cumulative hazard by treatment group). (B) Time to grade 2-4 treatment related neuropathy (cumulative hazard by treatment group). (C) Forest plot of the odds ratios for experiencing grade 2-4 neuropathy in the experimental study arm B compared with study arm A over various patient subgroups. Adapted from Joerger M, et al 19.
Overall these two studies demonstrate that the majority of patients being treated with BSA based dosing of 3-weekly paclitaxel are being given supra-therapeutic levels of paclitaxel and these higher levels contribute to higher toxicities, especially neuropathy, without improving efficacy. PK-guided dosing to target exposure personalizes the therapy and may be useful in patient management by lowering dose intensity to reduce neutropenia and neuropathy while still maintaining efficacy.

Making testing more user friendly by employing a limited sampling strategy, having available assays and simplified software to calculate exposure should allow for wider acceptance of testing.

Since the publication of these papers with few exceptions, there is very little use of paclitaxel TDM. Oncologists are not trained to use TDM as a tool, they are uncomfortable with it and, are often adverse to the concept. Maximum tolerated exposure (MTE) is simply not considered when protocols call for dosing based on BSA. Additionally, given all the excitement in oncology for the next new drug, it is difficult to attract the attention of the oncology community with a laboratory test to optimize dosing. However, if we are interested in precision medicine, TDM has a key role to play in this endeavor. Let us hope that in the future we are not still recommending BSA-based dosing in oncology. If we are truly interested in personalized medicine let us hope that we will have moved to dosing a patient with the right drug at whatever dose is required to achieve the right exposure.

Fig 2: Comparison of PTX exposure [Tc (Tc > 0.05)] in the BSA (red) and PK (green) groups by cycle over 4 cycles. Adapted from Zhang J, et al20.

Fig 3: Comparison of chemotherapy-related hematological toxicities and neuropathy between arms. BSA (gray) and PK-guided (green)(A) Grade 4 hematological toxicities (B) Grade 4 neutropenia (C) Grade >1 neuropathy (D) Grade >2 neuropathy. Adapted from Zhang J, et al20.

References

Drug use in America determined by urine drug testing. Is a Gabapentin crisis next?

Amadeo Pesce, Dennis Ritz, Keith Tran, Greg Ackerman, Richard Thomas, Katie Bollman, Joyce Nickley, Kevin Krock.
Precision Diagnostics LLC San Diego CA.

The Department of Health and Human Services of the United States government has declared an opioid epidemic exists in the country1. There is needed to better understand the crisis. Quest Diagnostics has recently published a document describing drug misuse in America 20192. They state their study represents nationally representative, objective de-identified laboratory data. They examined their results from 2011 to 2018 on specimens sent by primary care physicians excluding results from rehabilitation clinics and addiction specialists2. Of the 4.4 million test results, they noted drug misuse to be 51%. We believe misuse is defined as not following prescribing directions, whereas illicit use could include the abuse of illegal drugs. In our population of 776,420 specimens sent from pain physicians and rehabilitation centers from April 1, 2016 to June 30, 2019, we noted the following incidences of illicit drug use: heroin (as defined by the presence of 6-monoacetylmorphine, 6-MAM) 34,440 cases; cocaine (as defined by the presence of benzoylecgonine) 89,271 cases, methamphetamine 59,731 cases3. We also tested for urinary cannabinoid metabolite THC-COOH (11-Nor-9-carboxy-THC). In this cannabinoid case, we observed 138,640 positive specimens (an 18% positive rate). We chose to classify the 6-MAM, benzoylecgonine, and methamphetamine as illicit drug use. In order to obtain a more accurate picture of drug use we subtracted polysubstance use. In that case we observed 3014 cases of 6-MAM and benzoylecgonine, 9616 cases of 6-MAM and methamphetamine and 9355 cases of benzoylecgonine and methamphetamine. This reduced the number of specimens positive for illicit drug use to 161,457 or approximately 21%. The Quest study noted that 24% of patient test results that were positive for cocaine were also positive for non-prescribed fentanyl. In our study, we found 19,144 cases of the 89,271 were also positive for fentanyl or 21.4%. These two results are very similar even though the two populations were stated to be different. Quest described their samples from primary care providers, while the Precision study was data from pain physicians and rehabilitation facilities. In another comparison, Quest reported that 64% of patient test results that were positive for heroin were also positive for non prescribed fentanyl, whereas our data indicated this value was 43.1%. However, both studies show that heroin is commonly laced with fentanyl.

Both studies show that use of illicit drugs is very prevalent in both primary care practices and in the pain and rehabilitation settings. One limitation of both studies is the flawed nature of self-reporting on prescribed medications4. Providers can forgo reporting of prescriptions and patients are not always forthcoming with what they are prescribed. This can magnify data on non-prescribed misuse. The ability of primary care physicians to use drug testing to diagnose substance abuse is contrary to the concept that they are unable to detect illicit drug use. Use of drug testing to monitor drug use before and after prescribing can assist in assessing patient compliance.

ROLE OF GABAPENTIN

On the other hand, urine drug testing for illicit drug use in the pain, rehabilitation and primary care populations does not describe the “opiate epidemic”. Prescription drugs remain a contributor to drug use deaths. Gabapentin is of specific interest5-13. A brief comparison of the Quest Health Trends Report2 to that of the DEA National Forensic Lab Info Sys, NFLIS 2018 Annual summary (published 9-2019)5 which tracks illicit drug seizures, shows some differences in illicit drug use. The DEA NFLIS report is compiled from drugs identified by seizure from State and Federal law enforcement and represents drugs ‘on the street’. It is interesting to compare the commonly found ‘street’ drugs and those observed in the usual urine drug testing. The source of the specimens can and in this case do, show different drug patterns. The Quest Health Trends Report Finding 4 states: “While physicians may think of gabapentin as a less risky alternative to opioids, rates of misuse are surging. Laboratory data from Quest Diagnostics show that non-prescribed gabapentin misuse rose 40% in one year -to 13.4% in 2018 from 9.6% in 2017. This makes gabapentin the most commonly misused prescription drug in 11 states and in the top three drug groups in an additional 10 states”.

However, the DEA NFLIS lists gabapentin 24th of 25 frequently identified, nationally at 0.18%. Because it is not observed on the street it is not in the same category as the illicit drugs cocaine and methamphetamine and the source of the drug must be from prescribing physicians. This may lead to the conclusion that gabapentin is being greatly overprescribed by physicians in response to the opioid crisis; it is not prevalent ‘on the street’ while it has become very prevalent in physician ordered urine drug monitoring. Gabapentin is FDA approved for anticonvulsant and neuropathic pain. It is prescribed as adjunctive therapy and ‘off-label’ uses for many conditions. An estimated 90% of prescriptions are for ‘off label’ uses15. As a response to the opioid crisis, physicians are increasingly prescribing gabapentin. Taken alone gabapentin has a very low toxicity, but gabapentin is a potentiator of CNS depressants and frequently found with opioids, alcohol, and other illicit drugs14. Another gabapentinoid, pregabalin (Lyrica®) was FDA approved for generic (reduced cost) status in July of 201916. It is likely both gabapentinoids will become increasingly prescribed and misused. Precision Diagnostics tests for both in all urine drug panels to assist with assessment of patient compliance and misuse. Figure 1 and the underlying data Table 1, describe tests positive for gabapentin observed vs time (by yearly quarter) divided by total specimens accessed. These data show that early on (2016) the percent observed was less than the most recent (2019). That is, the percent of specimens positive for gabapentin increased. This observation of increasing gabapentin use is similar to that noted by Quest in their Report. Using a two tailed t test, the values for the first two quarters of 2016, are significantly less than the values for the first two quarters of 2019. The percent observed for 2019 is about 50% greater than those of 2016.
The current opioid epidemic in America may be winding down from the over prescribing of opiates period, but prescription of gabapentinitoids for pain relief is increasing and could cause a resurgence. For example, pregabalin is now a FDA approved generic at much lower cost and will join gabapentin as useful, used and abused. Although the acute toxicity of gabapentinitoids is much lower than major opioids, combinations of gabapentinitoids with opioids, benzodiazepines and other medications may become problematic. The at-risk drug using/abusing population, especially in pain management, will need urine and oral fluids monitoring to detect poly pharmacy. From the data presented here, it appears that ‘Street’ drugs including heroin, cocaine, oxycodone and methamphetamine will continue to be adulterated with fentanyl and its analogues and continue to fuel the opioid epidemic. Physician use of laboratory drug monitoring will allow tracking of drug use, and hopefully improve patient compliance and outcomes.

**REFERENCES**


3. Precision Diagnostics data, unpublished.


---

**Figure 1.** Gabapentin positive tests normalized by total accessed specimens.

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter (Q)</th>
<th>Total Pos for Gabapentin</th>
<th>Total Specimens</th>
<th>Total Pos Gabapentin (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>2</td>
<td>3,239</td>
<td>68,433</td>
<td>4.7</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3,953</td>
<td>72,981</td>
<td>5.4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4,518</td>
<td>88,364</td>
<td>5.1</td>
</tr>
<tr>
<td>2017</td>
<td>1</td>
<td>5,340</td>
<td>97,205</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4,871</td>
<td>84,523</td>
<td>5.8</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>5,330</td>
<td>72,612</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>6,068</td>
<td>79,606</td>
<td>7.6</td>
</tr>
<tr>
<td>2018</td>
<td>1</td>
<td>8,992</td>
<td>100,835</td>
<td>8.9</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>8,450</td>
<td>117,669</td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>10,274</td>
<td>128,357</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>8,898</td>
<td>131,947</td>
<td>6.7</td>
</tr>
<tr>
<td>2019</td>
<td>1</td>
<td>12,073</td>
<td>146,353</td>
<td>8.2</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>10,871</td>
<td>151,250</td>
<td>7.2</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>7,144</td>
<td>103,087</td>
<td>6.8</td>
</tr>
<tr>
<td>S.D.</td>
<td></td>
<td>2907</td>
<td>28960</td>
<td>1.3</td>
</tr>
</tbody>
</table>

**Abbreviation:** Pos: positive; S.D: standard deviation.

**Table 1.** Percent of total positive gabapentin tests against total specimens observed in each yearly quarter between 2016 and 2019.
Dr. Lea Wagmann. “I studied pharmacy in Saarbrücken, Germany, and started working in the field of toxicology in 2015 during my PhD thesis at the Saarland University under supervision of Prof. Hans H. Maurer. The thesis was entitled “Psychoactive Substances as Substrates or Inhibitors of Enzymes in Drug Metabolism and Transport” and focused on the toxicokinetics of drugs of abuse. Since January 2019, I am working as a postdoc at the Department of Experimental and Clinical Toxicology (Prof. Markus R. Meyer, Saarland University) in Homburg, Germany. My first IATDMCT congress was the meeting 2017 in Kyoto, which I really enjoyed. I am looking forward to being part of the Young Scientist Committee and seeing you all in Banff!” she says. Welcome Lea!

Communications committee: Miao Yan is an Associate Professor and Deputy Director at Scientific Research Department of the Second Xiangya Hospital, Central South University, China. He has been elected as one of the IATDMCT Councilors in 2019. He is also the Chair of Young Scientist Committee, Division of Therapeutic Drug Monitoring, Chinese Pharmacological Society (CHINA-TDM) and he is the Director of Toxicology Counseling Center of Hunan Province (TCCH), China. As a Clinical Pharmacist and Clinical Researcher, he focuses on Therapeutic Drug Monitoring and Clinical Toxicology (TDM & CT). He has strong interest in optimizing pharmacotherapy with TDM, and exploring ways to enhance efficacy and reduce toxicity of antibiotic therapy and anti-tumor therapy. Recently, he began studying the population pharmacokinetics of the antifungal drug voriconazole in renal transplant recipients and patients with liver dysfunction. He founded the IATDMCT-CHINA TDM Young Scientist Joint Symposium in 2019. He believes that: "The first youth is given by God, the second is of yourself".

Toxicology and Environmental Health Committee: Guillaume Binson. “After graduating with a degree in Pharmacy in 2017 at the University of Poitiers, I began to work at the Pharmacy department of Poitiers teaching hospital, where my area of expertise comprises clinical pharmacy and pharmaceutical technology. I also work in the field of environmental health at the HEDEX (Health-Endocrine Disruptors- EXposome) research group, headed by Prof. Virginie Migeot. My PhD thesis, under the supervision of Prof. Antoine Dupuis and Dr. Nicolas Venisse, focuses on endocrine disruptors, more specifically the link between exposure to parabens and administration of medicines to neonates. I am also involved in the development of ultra-sensitive methods to detect and quantify these endocrine disruptors in human matrices, using mass spectrometry. I am very glad to become a member of the IATDMCT Toxicological and Environmental Health committee and I wish to contribute further to the comprehension of exposure to endocrine disruptors”.

SPOTLIGHT ON NEW MEMBERS

WELCOME THE NEW MEMBERS OF IATDMCT COMMITTEES
MEMORANDUM OF UNDERSTANDING FOR COLLABORATION BETWEEN IATDMCT AND ACCP SIGNED

The IATDMCT Executive Committee is delighted to announce that the negotiations with the American College of Clinical Pharmacology (ACCP) are completed.

The two societies signed a Memorandum of Understanding for the purpose of working together to develop, plan and conduct various educational events and programs and to develop and produce research and policy papers/statements relevant to the fields of clinical pharmacology, therapeutic drug monitoring and clinical toxicology. First efforts might include, but not be limited to the joint development of symposia at the upcoming ITDMCT and ACCP Annual Meetings as well as of joint manuscripts or position papers.

MEMBER-GET-A-MEMBER CAMPAIGN 2020 UPDATE

Invite Your Friends and Colleagues!

Dear Colleagues,

The “Member-get-a-member” Campaign has already more than 10 years of successful history in IATDMCT. Initiated by Dr. Don LeGatt, the campaign is traditionally led by the IATDMCT Secretary with the purpose of encouraging current members to recruit colleagues to our Association. Now I am looking back respectfully and proudly at the many campaign editions that attracted a lot of new members for IATDMCT and helped the Association to grow.

This year’s Campaign started in January and I am delighted to report that up to May 11 new members were recruited by 11 established members.

Well done to all who participated!

As usual the prize for this year’s Campaign was a free registration for the upcoming IATDMCT Congress! Although, sadly, due to the pandemic situation the Congress 2020 had to be cancelled, the achievement of the current participants is of course highly appreciated and it counts.

“Member-get-a-member” 2020 continues and becomes “Member-get-a-member” 2020/2021.

The Campaign rules and the participation procedure remain the same, but the deadline and the prize change.

NEW CAMPAIGN DEADLINE: AUGUST 30, 2021

THE TOP TWO “RECRUITERS” WILL RECEIVE FREE REGISTRATION FOR THE ROME CONGRESS 2021!!

Campaign Rules

• To receive credit for each new referral, the application form must include the name of the member who recommended them, and the application must be approved.
• The referral must be a paying member and must be enrolled for membership in order for the recruiter to be eligible for the prize of one free registration fee for the Rome Congress 2021.

How Do You Participate?

• Know your IATDMCT Member benefits.
• Contact potential members. Share how IATDMCT has benefited you, give them the IATDMCT Membership Application Form or direct them to Join IATDMCT on our website at http://iatdmct.org/member-join. The application form has a section for the new member to place your name as the person who recommended them for membership.
• Send an email to the IATDMCT Office with the potential member’s name and email address and the IATDMCT office staff will follow up with them personally.
• When the new member’s application arrives with appropriate payment and is approved, you will be advised by email.

Visit the IATDMCT webpage for complete participation details!

Be active for IATDMCT, take part in this campaign and win the prize!

Respectfully submitted,

Maria Shipkova
IATDMCT Secretary
IN MEMORIAM ERIK VAN MAARSEVEEN

On Saturday May 16, one day before his 41st birthday, Dr. Erik van Maarseveen passed away. His death was a shock to all who were close to him. Also, within the IATDMCT community this in memoriam will be received as unexpected and very very sad news. He was such a nice guy. Many of you may have seen him at the congresses in Kyoto or Brisbane, alive and active as ever before. He was always in for a discussion on a scientific topic, or just for a chat or a beer.

Erik was trained in hospitals in The Hague and Gouda, in the Netherlands. From 2010 Erik worked as a hospital pharmacist and clinical pharmacologist in the University Medical Center in Utrecht, where he headed the TDM-TOX laboratory with great enthusiasm and skills. It was his ambition to build up a lab, and a group of scientists, with international recognition for innovation and expertise. In 10 years’ time he succeeded in doing so. A couple of weeks ago I visited him in Utrecht and he proudly showed me his lab, including his impressive collection of LC-MS/MS equipment. He was an expert in the area of TDM for several drugs, including tacrolimus, busulfan and tobramycin. His involvement with patient care was the main driver of his ambitious plans, and he was in close contact with the physicians caring for solid organ transplant patients, cancer patients, patients with treatment resistant hypertension and the stem cell transplant group. He visited numerous IATDMCT congresses and was a member of the IATDMCT Council from 2017-2019, as one of the Directors of Education. His passion for teaching and education was legendary, and he always supported young scientists, including pharmacy students, to join him on his international trips. Every scientific publication that was the result of a project of his students and fellows was celebrated. Furthermore, as a member of the Utrecht team he acquired the Joint Accreditation Committee ISCT-Europe & EBMT (JACIE) accreditation for haematopoietic stem cell transplantation (HSCT) and cellular therapy.

It is very difficult to accept that Erik is no longer with us. He had so many plans, and no doubt he would have achieved so much more. For the upcoming Banff congress, he took the lead to submit proposals as the Chair of Oncology Scientific Committee. There was still so much on his to do list. It is all hard to understand. We do know that he was a friend for many of us, and will be dearly missed. Our thoughts are with his wife Marieke and his children Sam, Liv and Ties. He was so proud of them.

Teun van Gelder, May 19, 2020.