

# Respiratory medicine in Iraq – from the primitive to the advanced

Mudher Al-khairalla<sup>1</sup>, Mwaffaq Qaraghulli<sup>2</sup>, Mohammed Alwan<sup>3</sup>



Healthcare in Iraq has seen significant decline over the past few decades. Political instability coupled with austerity due to conflict and war has become a major obstacle in the transition needed to restore acceptable healthcare standards.

Respiratory medicine had remained under developed despite the potential benefit it could offer to many people suffering diseases of high prevalence.

A dedicated team of experts carried out a feasibility study to create a specialist respiratory centre, ThiQar lung diseases (TQLD). Equipped with advanced diagnostic equipment, a paperless hospital information system and staff trained by specialists from the UK, the centre has reduced a significant healthcare gap. It now serves a large population catchment area and has helped offer people an alternative to seeking healthcare abroad.

## Correspondence to:

Mudher Al-khairalla  
ThiQar Lung Diseases  
Centre  
Nasiriyah, ThiQar Province  
Iraq

## Email:

mudheriraq@gmail.com

**Keywords:** hospital information system, Iraq, one-stop clinic, respiratory medicine

**Financial and Competing Interests:** No conflict of interests declared

## Iraq – brief facts

The republic of Iraq is a country located in the heart of the Middle East in western Asia. The country is globally ranked 58 in size with an area of 437,072 km<sup>2</sup> (the UK is ranked 78). It has a population of approximately 37 million people.<sup>1</sup> The country is bordered by Turkey in the north, Syria, Jordan and Saudi Arabia in the west, Kuwait in the south and Iran in the East. It has a small coastline on the Persian Gulf in the south. Historically, it is known as the land between the two rivers, Mesopotamia, and often referred to as the cradle of civilisation. It is a culturally rich country and has a diverse ethnic population. Iraq has gone through significant transitions in Government, and from 2003 the country has been recognised as a federal parliamentary republic. The Prime Minister acts as the head of government of Iraq. The economy is dominated by the oil sector and has struggled to develop other sectors, which in turn has led to high unemployment and a lower standard of living.<sup>2</sup>

In the 15 years I served the UK's National Health Service (NHS) (2000–15), whenever I mentioned Iraq, the country of my origin and much of my heritage, friends, patients and colleagues could not help but express condolence. No doubt, decades of political instability, corruption, violence and war marred the image of this country. The infamous autocratic regime toppled in 2003 brought hope for a better future in a country rich in natural resources. Sadly, more than a decade has passed since with little progress made in rebuilding Iraq's infrastructure.

## The challenges of healthcare over the past decade

Healthcare provision in Iraq has traditionally been a combination of public-funded primary and secondary care facilities along with 'out-of-hours' private clinics. The past decade has seen a decline in the quality and standards of public-funded 'free' healthcare settings owing to austerity, corruption and mismanagement. The private sector requires better regulation; however, it has become a more reliable and trusted source for providing healthcare provision.

Iraq's healthcare has suffered greatly<sup>3</sup> from a lack of centralised government funding owing to onerous and punishing austerity on a background of a fragile system, which previously focused on hospitals rather than expanding primary care services.<sup>4</sup> Certainly my experience in 2015 reflected this sad reality.<sup>5</sup> There are gaps in the literature with regards to studying the burden of respiratory disease in the region.<sup>6</sup> The global burden of diseases project published in 2010 ranked lower respiratory tract infections as the leading cause of disability-adjusted life years in Iraq.<sup>7</sup> Dedicated efforts were made to establish the first national respiratory centre, which included a state-of-the-art pulmonary function and sleep laboratory<sup>8</sup> (Figure 1), a theatre designed to host advanced pulmonary intervention procedures and formal training of those keen to advance their respiratory careers. Within a couple of months of the opening ceremony, attended and hosted by the minister of health, the centre came to

<sup>1</sup>Consultant and Lecturer in Respiratory Medicine, ThiQar Lung Diseases Centre, Nasiriyah, Iraq; <sup>2</sup>Senior Mechanical and Medical Engineer, ThiQar Lung Diseases Centre, Nasiriyah, Iraq; <sup>3</sup>Engineer and Software Programmer, Head of LAGASH Information Technology, Baghdad, Iraq

**Figure 1** Pulmonary Function Laboratory at the Public Centre in 2015



unforeseen stagnation. This left me in a predicament. Do I accept defeat and cut my career break short by returning to my substantive consultant post in the UK? Was there a 'plan B' I could find that would make my efforts less futile?

### Privately funded healthcare

I discovered that despite the lack of regulation, advanced diagnostic facilities and coordination of patient care, the private healthcare scene was a more attractive and trusted alternative by the general public. Those who were more affluent preferred seeking health tourism in neighbouring countries when they fell ill. They often voiced disappointment at the lack of advanced healthcare settings. Those who were financially deprived expressed their anguish when they struggled to afford the healthcare bill.

'Growing up' in the UK's NHS made me feel uneasy about dipping my feet in the 'hot' private sector waters. Would I be able to function in an environment where passionately held beliefs, such as the provision of health equality irrespective of age or means, could be compromised?

Three years down the line, with the benefit of hindsight, I interestingly find the respiratory institution we have created in the private sector a much more attractive proposition. There is no doubt the rewarding sense of heroic altruism has been preserved. The speed at which we were able to advance respiratory services was possible when little government bureaucracy could get in the way. The direct

**Figure 2** ThiQar Lung Diseases Centre



**Box 1** Core values of ThiQar Lung diseases Academic Institution

- Quality in:
  - Healthcare
  - Services
- Affordable healthcare
- Team work
- Training, research and development
- Creating an institution
- Promoting ambulatory care

control of finances allows maintenance and sustainability of the services we provide. The centre is a low-cost private institution with a formal partnership with the existing government-funded public centre we opened in 2015. This public-private partnership has helped subsidise costs to our patients.

The complex socio-cultural and economic situation in Iraq was an indicator that one should not assume that simply replicating existing healthcare models in other parts of the world would provide a solution. Indeed, creating a unique and bespoke healthcare system tailored to the need of the local population would be a more fruitful exercise.

### The creation of ThiQar Lung Diseases Centre

Encouraged by an abundance of unwavering enthusiastic talent, with support from private independent investors, we managed to put together a detailed feasibility study, which allowed the creation and official recognition of ThiQar Lung diseases Academic Institution (TQLD)<sup>9,10</sup> (Figure 2).

**Figure 3** The yin yang of preserving the core and stimulating progress. Copyright © 1994. Reprinted by permission of Curtis Brown, Ltd. All rights reserved



**Table 1** Available diagnostic and therapeutic facilities/interventions across respiratory conditions in Iraq

Respiratory condition/diagnosis	Services pre-TQLD	Services post-TQLD	Not yet readily available
Lung cancer	<ul style="list-style-type: none"> <li>• Simple pleural aspiration</li> <li>• FNA of peripheral lymph node</li> <li>• Radiotherapy centres in neighbouring provinces</li> <li>• Minimally invasive diagnostic and staging techniques generally not available</li> </ul>	<ul style="list-style-type: none"> <li>• Contrast CT chest staging protocol</li> <li>• Diagnostic flexible fibre-optic bronchoscopy</li> <li>• Flexible fibre-optic pleuroscopy</li> <li>• Image-guided core biopsy of lung parenchymal lesions</li> </ul>	<ul style="list-style-type: none"> <li>• Staging EBUS<sup>+</sup></li> <li>• Mediastinoscopy<sup>++</sup></li> <li>• Immunohistochemistry*</li> <li>• PET-CT scan</li> <li>• CPEX</li> <li>• Palliative bronchial stent insertion</li> </ul>
MTB/MOTT	<ul style="list-style-type: none"> <li>• Tuberculin skin test</li> <li>• MTB PCR</li> <li>• IGRA test</li> </ul>	–	<ul style="list-style-type: none"> <li>• Culture medium or PCR for MOTT</li> </ul>
Suppurative infections	<ul style="list-style-type: none"> <li>• Intercostal drainage via Argyle™ large bore intercostal drainage</li> <li>• Surgical decortication</li> </ul>	<ul style="list-style-type: none"> <li>• Seldinger technique small bore intercostal drainage</li> </ul>	–
Interstitial lung diseases, vasculitis and pulmonary sarcoid	–	<ul style="list-style-type: none"> <li>• Transbronchial lung biopsy</li> <li>• High-resolution CT protocols</li> </ul>	<ul style="list-style-type: none"> <li>• VAT biopsy**</li> </ul>
Bronchiectasis	–	<ul style="list-style-type: none"> <li>• High-resolution CT protocols</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Pseudomonas aeruginosa</i> culture plates</li> <li>• Genotyping for suspected CF</li> </ul>
Asthma	–	<ul style="list-style-type: none"> <li>• Spirometry</li> <li>• Guideline-based treatment practice</li> <li>• FeNO</li> <li>• Biological agents in severe asthma<sup>^</sup>, serum total IgE and other tests to phenotype asthma</li> </ul>	<ul style="list-style-type: none"> <li>• Bronchial thermoplasty</li> <li>• Bronchial provocation test</li> </ul>
COPD/emphysema	–	<ul style="list-style-type: none"> <li>• Spirometry assessment by trained respiratory technicians</li> </ul>	<ul style="list-style-type: none"> <li>• Pulmonary rehabilitation</li> <li>• Ventilation–perfusion assessment to determine those suitable for lung volume reduction</li> <li>• Endobronchial lung volume reduction techniques</li> <li>• Plethysmography</li> </ul>
Sleep apnoea and alveolar hypoventilation	<ul style="list-style-type: none"> <li>• ABG</li> </ul>	<ul style="list-style-type: none"> <li>• Limited PSG and nocturnal pulse oximetry</li> <li>• CPAP</li> <li>• Bi-level ventilation</li> </ul>	<ul style="list-style-type: none"> <li>• Full PSG</li> </ul>
PPH	–	<ul style="list-style-type: none"> <li>• Diagnosis based on transthoracic echocardiogram and exclusion of secondary causes</li> </ul>	<ul style="list-style-type: none"> <li>• Right heart catheterisation and dedicated service</li> </ul>
Pulmonary thromboembolic disease	<ul style="list-style-type: none"> <li>• CTPA</li> </ul>	–	<ul style="list-style-type: none"> <li>• Ventilation–perfusion scans</li> <li>• IVC filter insertion</li> <li>• Pulmonary thromboendarterectomy in CTEPH</li> </ul>

Table 1 Continued

Respiratory condition/diagnosis	Services pre-TQLD	Services post-TQLD	Not yet readily available
Pleural effusion	• Abrams pleural biopsy	• Pleuroscopy under conscious sedation	• Talc poudrage*
Massive haemoptysis	• Open thoracotomy	–	• Bronchial artery embolisation
Pulmonary AVM	–	–	• Coiling

+Available at Tiba Centre Babylon Province.

\*\*Available in Baghdad.

\*Partially available in Basra or Baghdad.

\*\*Video-assisted thoracoscopy, recently available in Baghdad.

^Limited access to biological agents.

ABG: arterial blood gas; AVM: arteriovenous malformation; CF: cystic fibrosis; COPD: chronic obstructive pulmonary disease; CPAP: continuous positive airway pressure; CPEX: cardiopulmonary exercise testing; CTEPH: chronic thromboembolic pulmonary hypertension; CTPA: CT pulmonary angiogram; EBUS: endoscopic bronchial ultrasound; FeNO: forced expiratory nitric oxide; FNA: fine-needle aspiration; IgE: immunoglobulin E; IGRA: interferon gamma release assay; IVC: inferior vena cava filter, sometimes available in Baghdad; MOTT: mycobacteria other than tuberculosis; MTB: mycobacterial tuberculosis; PCR: polymerase chain reaction; PPH: primary pulmonary hypertension; PSG: polysomnography; TQLD: ThiQar lung diseases centre; VAT: video-assisted thoracoscopic

Inspired by trademark global visionary companies, the centre was founded on a number of uncompromising core values (Box 1 and Figure 3), which helped stimulate progress whilst preserving our core values.<sup>11,12</sup>

A public–private partnership was quickly established to help support and subsidise costs to those less wealthy.

TQLD has now opened its doors to a catchment area of approximately 15 million people. Indeed, it has attracted people from further afield, where similar respiratory services do not yet exist. The reader will no doubt detect the geographical inequity in accessing advanced healthcare settings such as this one; however, we hope that the model we created can provide a strategy that can be replicated to help create more accessible centres in the future.

The centres now host a workforce of more than seventy people (including four respiratory specialists, one thoracic surgeon, one laboratory clinician and three junior medical trainees). The team helps provide a streamlined service with a growing turnover of patients, currently averaging 2,500–4,000 patient episodes per calendar month across the two centres.

Across common respiratory diagnoses and clinical presentations, TQLD has made significant progress in offering much needed diagnostic and therapeutic interventions (Table 1). What we found more pressing and paramount was the need to address defects in the approach and management of prevalent diseases, such as asthma and chronic obstructive pulmonary disease (COPD). This was carried out through intensive and dedicated educational events and practical training to encourage colleagues to adhere to established international guidelines.

In asthma and COPD there are many deeply ingrained misconceptions about the role of maintenance therapy, the prospects of a cure and perceived undesirable adverse effects related to inhaler devices. Indeed, a great part of our time and

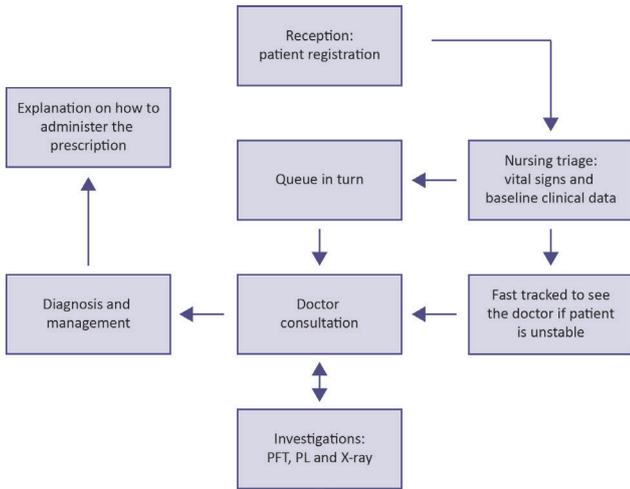
effort has been focusing on patients with treatable asthma and COPD and helping them attain remission of their disease. We have also introduced a system that has expanded the roles of doctors and nurses who now offer patient education and action plans. This has helped provide more autonomy, particularly to those who live in the periphery of the province and beyond. The role of the specialist respiratory nurse has been welcome. Our staff are eager to replicate the models that exist in advanced care settings in the developed world, which have helped expand and utilise the role of professions allied to medicine.

### How did my role as a substantive consultant in the UK compare to my current role in Iraq?

There are times when I naturally compare my current daily routine and job description to my previous position as a busy substantive consultant in respiratory medicine and lung cancer lead for a trust in South Yorkshire. There are a few aspects that have been more appealing in my daily professional routine. Firstly, we have had a lot more freedom and flexibility in determining a weekly schedule for our specialist medical staff with a focus on refining and enhancing our work–life balance. The centre is able to offer such flexibility as we have embraced a system that encourages teamwork and an environment where patients are looked after by the whole team, rather than individual clinicians. Indeed, this has been received positively and has become the envy of so many colleagues who continue single-handed clinical practice. Clinical service provision and supporting professional activity is now 46 hours a week compared to my average of 55 hours a week in the UK. I also have a more generous allocation of annual and study leave days.

Secondly, most patients who traditionally would have required admission in the UK are managed in an ambulatory fashion here in Iraq. They receive regular monitoring of their progress in the outpatient setting, usually twice or thrice weekly until medical stability is achieved. In-patient beds are only

**Figure 4** One-stop clinic flow. PFT: pulmonary function tests; PL: pathology laboratory



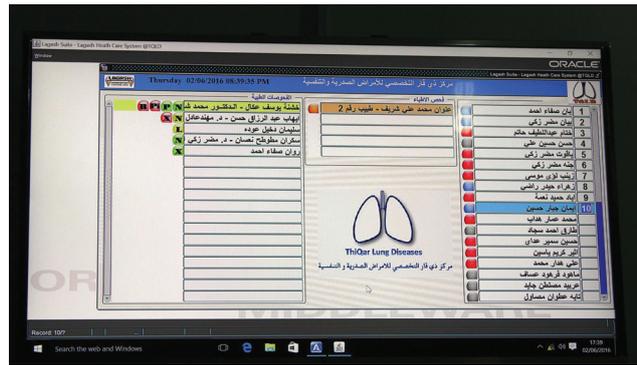
utilised when it is absolutely necessary to do so. Despite the smaller number of hospitals for the population size, bed shortages are uncommon and patients who are medically fit for discharge are discharged without social delays.

Thirdly, the centre has introduced a system that allows a ‘one-stop’ clinic journey in over 90% of patients (Figure 4). This translates to a patient who arrives at the centre, is registered at reception, and triaged by the nursing team who measure vital signs, enter the patient’s past medical history, allergy history and current medication into the paperless digital system network. The patient then consults the doctor(s) who instigates a differential diagnosis and if required arranges the necessary investigations. The patient is then invited back to discuss the results of their investigations and agree on the management strategy. Endoscopy and CT are often completed on the same day when requested. The patient then collects their medication with appropriately trained staff, guided by the doctors, who help them safely and clearly understand how to administer their medication. The digital system generates a report that contains the consultation details. The report also contains the prescription and follow-up appointment. The one-stop patient journey cycle takes only 1–3 hours from the allocated appointment time. It is certainly more streamlined than what I had been used to in the UK’s NHS.

**Creating a paperless system**

Digital systems and paperless records are not only scarce but also alien to most healthcare settings in Iraq. The advantages of adopting and utilising paperless records are evident to all those who recall the old fashioned paper records. Digital systems allow the more efficient and legible entry of clinical detail. They also enhance continuity of care and allow immediate access to existing records, clinical images and

**Figure 5** HAMSA™ queuing system (patient names in the image are fictitious and are for demonstration purposes only)



results of investigations. Such a complex system did not exist in Iraq. In a fortunate stroke of serendipity, I was introduced to a talented computer programmer resident in Baghdad. Over a gruelling 6 months, we managed to create Hospital Automation Management System & Archiving (HAMSA™), a bespoke system that helped us store patient details in a clear and retrievable way. The package also included a traffic light queuing system (Figure 5) that allows patients and staff to trace and follow patients throughout their clinic journey within the centre. The system also included a breakdown of activity by clinician. This is designed, in part, to help assess performance, not necessarily by income generated or number of patients seen, but for guiding or learning from doctors who are outliers in their clinical practice. This trigger offers an opportunity to discuss and encourage evidence-based clinical practice.

The system also has an integral, simple and comprehensive accountancy management unit that helps us accurately keep our accounts in order.

**Looking ahead**

TQLD has certainly been a positive experience that I have had the privilege to be part of. We would like to replicate this model across other parts of Iraq and for other specialities. Looking forward, I would like to see a focus on training local talent. I would also like to see the introduction of health insurance, particularly for those with chronic illnesses. I would welcome collaboration with colleagues across the globe but particularly in the UK where I still hold fond memories of the NHS and with colleagues and friends at the Royal Colleges. I hope that I can help expand existing bridges in order to advance healthcare, research and training in both Iraq and the UK. 1

**Acknowledgements**

We acknowledge the contribution of all ThiQar Lung Diseases Centre staff members who helped create this centre. Special thanks to Zayneb Al-khairalla, Sulaiman Dakheel, Mohammed Al-Hilali, Mohammed Yousef, Osama Obaid and Ali Obaid.

## References

- 1 *World Population Prospects: The 2017 Revision*. New York: United Nations Department of Economic and Social affairs, Population Division; 2017.
- 2 *The World Factbook*. Washington, DC: Central Intelligence Agency; 2017.
- 3 Webster PC. "Under severe duress": health care in Iraq. *Lancet* 2016; 388: 226–7.
- 4 Al-Hilfi TK, Lafta R, Burnham G et al. Health services in Iraq. *Lancet* 2013; 381: 939–48.
- 5 Van den Berghe A. Breathless in Iraq. *Lancet Respir Med* 2015; 4: 14–5.
- 6 Abubakar A, Malik M, Pebody RG et al. Burden of acute respiratory disease of epidemic and pandemic potential in the WHO Eastern Mediterranean Region: a literature review. *East Mediterr Health J* 2016; 22: 513–26.
- 7 Global Burden of Diseases, Injuries and Risk Factors Study 2010: GBD profile: Iraq. [http://www.healthdata.org/sites/default/files/files/country\\_profiles/GBD/ihme\\_gbd\\_country\\_report\\_iraq.pdf](http://www.healthdata.org/sites/default/files/files/country_profiles/GBD/ihme_gbd_country_report_iraq.pdf) (accessed 12/01/19)
- 8 Jones D. The set-up of a pulmonary function and sleep laboratory in Nasiriyah, Iraq. *J Assoc Respir Technol Physiol (Inspire)* 2015; 16: 29–37.
- 9 'Breathless in Iraq'. <https://www.youtube.com/watch?v=gPQFfhGADbA&t=325s> (accessed 28/07/18).
- 10 Al-khairalla MZ, Qaraghulli MM. Establishing respiratory services in Iraq... From the primitive to the advanced! Abstract presented at Gulf Thoracic Conference; Dubai; 2018 Mar 14–17.
- 11 Collins J, Porras J. *Built to Last: Successful Habits of Visionary Companies*. 10th ed. London: Random House Business Books; 2005.
- 12 Collins J. *Good to Great*. 1st ed. London: Random House Business Books; 2001.