A White Paper investigation into the
Proposed Commissioning of
new PET-CT Services in England

CREDO
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About the Author

Credo is a market leading advisory services firm, helping many of the world’s most dynamic organisations formulate and implement more informed strategic decisions.

We operate across 6 core sectors, with expertise in several healthcare services markets, including diagnostics, primary care, secondary acute care, mental health, and fitness. We work for a mix of private providers, third sector organisations, and financial investors.

About the Sponsor

This paper has been sponsored by Alliance Medical, Europe’s leading independent provider of medical imaging services, with operations spanning the UK, Germany, Ireland and Italy.
Introduction

Positron emission tomography–computed tomography (PET-CT) imaging is a key healthcare examination, central to the diagnosis and staging of various cancers. Despite a significant increase in the volume of PET-CT scans performed globally, further growth is widely anticipated, driven by:

• Increasing reliance by clinicians on the technology
• Increasing prevalence of cancer
• New applications for PET-CT scanners, including expected progress in its ability to support early identification of Alzheimer’s

The Department of Health has successfully increased PET-CT provision in the UK, partly through the tendering of two block contracts in 2008 for the provision of PET-CT services. These are due to expire in 2015, and currently account for c.30% of UK volumes. However, the UK still lags behind Western European comparators despite this central support and investment. Further, NHS Trusts face uncertainty about how PET-CT scanning can support their research aspirations, and how funding will develop going forwards to support the additional capacity required.

This White Paper examines the UK’s provision of these services compared with Western Europe and provides commentary on the commissioning options available to NHS England, both with regards to the end of the current block contracts, and how it can support further growth as NHS Trusts seek to install new static scanners over the coming years. Crucially, we believe there is a commissioning framework available that combines local knowledge and aspirations with centralised expertise and guidance.

PET-CT services are critical to the future health and wellbeing of the UK population. We believe that there is a route forward, driven by NHS England, that can achieve parity with Western European comparators for PET-CT availability, whilst ensuring sustainable, high quality and affordable PET-CT provision that is capable of meeting England’s longer term cancer treatment needs.

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Proposed commissioning of new PET-CT services in England

Positron emission tomography–computed tomography (PET-CT) imaging is a key examination for diagnosing the stage of disease in many cancers.

Used extensively in the assessment of Lung cancer, Colorectal cancer, Oesophageal cancer, and Lymphoma, PET-CT scans enable the identification of affected tissue and organs, as well as an indication of the disease’s level of activity.

Access to PET-CT facilities is of paramount importance if the NHS is to offer cancer diagnosis and treatment within the targeted patient pathway. This requires treatment within 62 days of an urgent suspected cancer referral from a GP (see Figure 1).

Section One
What are PET-CT services?

Fig 1. Cancer diagnosis and treatment pathway

- Urgent referral from GP
- Primary diagnosis
- Disease staging
- Treatment decision & commencement

When independent sector providers are asked to scan a patient, they must be seen and reported within 7 working days of the authorised request.
Alternative diagnostic equipment for cancer include Conventional X-Ray, CT, and ultrasound, but PET-CT is the modality of choice for most oncological specialties given its ability to assess the spread of cancer. This informs the range and aggressiveness of treatment options considered.

Other applications of PET-CT include indications for cardiac and neurology patients, as well as medical research. Credo anticipates additional applications in the future, with radiotherapy planning and Alzheimer's diagnosis examples of the actual and potential proliferation of PET-CT usage.

Despite these wider applications, cancer diagnosis and staging comprises c.99% of PET-CT scanning activity in England. It is this cancer-related activity that is currently being reviewed by NHS England, with a view to establishing future commissioning options for a material proportion of PET-CT provision. We therefore focus solely on cancer applications for the remainder of this paper.

PET-CT services provision extends beyond the supply and maintenance of the machine. Independent sector contracts typically include 7 components (Figure 2).

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### Fig 2. Independent sector PET-CT service components can include:

<table>
<thead>
<tr>
<th>Service Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radioisotope provision</td>
<td>Provision of the Radioisotope that is injected prior to scanning. For most cancer cases, this isotope is Fluorodeoxyglucose (FDG)</td>
</tr>
<tr>
<td>Equipment provision and maintenance</td>
<td>The provision and maintenance of a PET-CT scanner, which can be sourced through a variety of Original Equipment Manufacturers (OEMs)</td>
</tr>
<tr>
<td>Technologist, admin and support staff provision</td>
<td>Staff required to deliver the PET CT service are employed by the contract holder</td>
</tr>
<tr>
<td>Competency-based training</td>
<td>These staff receive comprehensive training as part of their role</td>
</tr>
<tr>
<td>Booking and scheduling</td>
<td>Provide booking and scheduling of patients, which must occur within specified timelines</td>
</tr>
<tr>
<td>Clinical reporting</td>
<td>Reporting of the scan by a Radiologist</td>
</tr>
<tr>
<td>Governance and quality monitoring</td>
<td>All independent sector contracts are subject to rigorous KPIs, and providers must have robust Quality Monitoring and Governance processes in place</td>
</tr>
</tbody>
</table>
Section Two

History of PET-CT service provision

In 2005 the Department of Health (DH) commissioned a review titled ‘A framework for the development of PET-CT’, which reflected the growing recognition among clinicians of the technology’s capability.

This report highlighted the improvement in cancer diagnosis facilitated by PET-CT scanning, as well as a paucity of access across much of the UK, particularly when compared to Western Europe.

The report resolved to increase provision to ‘around 800 scans per million population, [a figure that is] likely to rise further as the research evidence grows stronger and encompasses more cancer types and indications’.

Up until 2008, PET-CT scanning facilities in England were concentrated around major urban conurbations (see figure 3), but following these DH recommendations, two block contracts were tendered – PET North and PET South – to improve the geographic reach of PET-CT services.

The block contracts were awarded to two independent sector providers (Alliance Medical and InHealth), which provided these new services predominantly using ‘mobile’ scanners. ‘Mobile’ scanners can be transported between locations, such that a hospital can secure a number of days of scanning activity without bearing the cost of an entire PET-CT machine. Mobile units therefore enabled early deployment and provided access to both cancer centres and referring hospitals alike.

“About 30% of trusts are breaching a target that requires 85% of patients to have their first course of treatment within two months of an urgent referral.”

Sunday Times, 23rd March 2014

Over time, as throughput for these services increased, a limited number of sites transitioned from a mobile to a fixed installation (e.g. Portsmouth, Leeds, Sheffield and North Staffordshire) to accommodate additional scanning activity. This not only becomes more economical as scanning activity increases, but also facilitates an integrated clinical pathway by granting all-week access to the onsite facility.
**PET North and PET South**

The PET North and South contracts have materially extended the geographic reach of PET-CT services. These services (Figure 3) now comprise around a third of UK PET-CT volumes nationally (Figure 5) and cover all independent sector provision outside of London bar sites in Guildford, Birmingham, and Preston (where arrangements were in place before the block contracts were issued) and Cheltenham, where Cobalt runs an independent sector clinic that was commissioned outside of the block contracts.

These services are delivered to the NHS for an undisclosed price per scan (believed to be around £1,000), which covers the complete diagnostic pathway including provision of the radioisotope and specialist clinical reporting of the scans. As was expected, accompanying the increased access to PET-CT services established by these block contracts was a commensurate increase in scanning activity.

Historic data for the UK and Ireland suggests that PET-CT scans across the two regions have grown by 14% a year on average since 2008 (Figure 4), although the UK continues to lag behind European comparators for PET-CT scans per million (see section 4).
Proposed commissioning of new PET-CT services in England

Currently, NHS facilities providing PET-CT scans procure in one of three ways:

1. ‘In-house’ provision of service
   24 NHS Trusts have implemented local PET-CT services using their own equipment and employees. The required machinery has been purchased either by the hospital or by charitable contribution, as part of local commissioning arrangements.

2. Locally procured 3rd party provision
   Three NHS sites were already procuring PET-CT services through independent sector partnerships prior to the PET-North and PET-South contracts being let.

3. Centrally procured 3rd party provision
   Through PET North and PET South, just under one third of PET-CT scans are commissioned and procured centrally, although these contracts are due to expire in March 2015. How this activity will be commissioned in future is subject to NHS England review at the time of publication.

A geographic view of PET-CT provision is presented in Figure 6, where we have estimated scans per site, and have segmented provision using the categories outlined above.

Centrally procured third party provision (i.e. the PET North and PET South sites coloured blue and green), will need to be recommissioned before 31st March 2015. NHS England therefore has an opportunity to consider which types of PET-CT provision will deliver the best quality of care going forward, and what commissioning structures will facilitate the provision of those services.

“*We should set ourselves the achievable ambition of raising our cancer survival rates to match the very best in Europe. The key is early diagnosis*”

Sir Bruce Keogh, NHS England Medical Director

Section Three
Commissioning landscape today

Fig 6. PET-CT sites by procurement type

Source: Credo analysis of Alliance Medical estimated data
Section Four
The capacity dilemma

The UK’s PET-CT infrastructure is significantly less developed than western European comparators (Figure 7).

This should also be viewed against the backdrop of rapidly increasing demand for PET-CT services in the UK:

- Since 2008, PET-CT scanning activity has grown at 14% p.a. (Figure 4)
- Growth in demand for PET-CT is likely to continue for three main reasons:
  1. Clinicians are increasingly reliant on the service
     See the 2013 guidelines for PET-CT referral published by the Royal College of Physicians and Royal College of Radiologists for a detailed break down
  2. The prevalence of cancer continues to increase
     Each year around 250,000 new cases of cancer are diagnosed, a figure which is projected to increase by at least 2% p.a. for the foreseeable future (‘Improving Outcomes: A Strategy for Cancer’ - 2011)
  3. Increasing applications (e.g. Alzheimer’s therapeutics, etc.)

If the UK is to achieve parity with the average prevalence of PET-CT scanning activity across Western Europe (as was one of the goals of the originally let PET North and South contracts), it will need to carry out an additional 1,600 scans per million people.

There are 2 potential ways this could be achieved:

1. Increasing utilisation of the existing PET-CT infrastructure
   Figure 8 shows that the UK’s utilisation of scanners is broadly in line with European averages. It is therefore unclear to what extent increased scanning activity can be driven by utilisation. There may be things we can learn from other countries with relatively
high utilisation, but in many cases delivery models will differ significantly. In Italy, for example, scans take place in specialist diagnostic centres, rather than under the auspices of a hospital or Trust.

In order to effectively leverage our existing infrastructure, a three-pronged approach will be required to increase the number of scanners:

- Transition certain higher usage PET-North and PET-South sites from mobile to static scanning facilities
- Redeploy existing mobile facilities to facilitate a PET-CT service offering at new sites
- Offer additional scanning access at cancer centres with existing fixed installations as they near capacity

Investment in static scanners was something envisaged by the DH’s own framework when investigating developing PET services prior to letting PET-North and PET-South

- “The consensus view of experts is that new PET-CT developments should largely be based on fixed location scanners. These should normally be co-located with a cancer centre”

Assuming an average cost per scanner of £1.5m, and assuming no new building costs to house the PET-CT or investment support from the independent sector, this would require a capital investment of c. £135m

- However, it should be noted that these figures take no account of any related savings through avoiding unnecessary surgery (Thoracic and Oesophageal resections, for example)

To bring UK scanners per million in line with European averages would require 90 additional scanners (1.4 scanners per million behind EU average * 63m population)

2. Increasing the number of PET-CT scanners in the UK

It is this metric where the UK appears to lag significantly behind European comparators (Figure 9). Increased scanning activity is therefore likely to rely on an increase in the number of scanners per million people.

In order to transition from a mobile to a static scanner the commissioning authority will need to consider:

- **Where on a Trust’s site the static scanner will be located**
  Is there sufficient space within the hospital’s existing building? If not, who will provide and pay for the building of a new installation?

- **How mobile scanning services will continue while a static scanner is being installed**
  Who will provide these services during installation, which can take over a year where a new building is required? If a static scanner is being provided through an independent sector partnership, will that provider have sufficient mobile capacity to scan that hospital’s patients during the installation period?
Proposed commissioning of new PET-CT services in England

11

A critical juncture

It therefore appears that the NHS is at a crossroads in terms of PET-CT provision for four principal reasons:

1. Demand for PET-CT services is likely to continue to grow quickly over the next 10 years as applications, cancer prevalence, and clinicians’ propensity to rely on the technology all increase.

2. The existing PET-CT infrastructure will be unable to provide sufficient access for increasing levels of demand due to current reliance on mobile PET CTs.

3. NHS England is required to plan for future PET-CT service provision due to the expiring PET North and South contracts on 31st March 2015, which account for almost one third of UK activity. This planning needs to consider how long-term arrangements can support the installation of new statics in the coming years.

4. The NHS is presented with greater choice than ever before. The independent sector is innovating new delivery models (partnership working, fully financed static facilities etc), while the expertise at local Trust level in delivering PET-CT services is also increasing.

The challenges facing NHS England

Credo understands that PET-CT services will continue to be funded by the c.£12bn specialised services commissioning budget. Currently, this budget supports both localised and national service commissioning:

- **Locally commissioned (c.70% of volumes)**
  NHS England pays for ‘in-house’ PET-CT service provision, as well as independent sector arrangements that were in place prior to PET-North and PET-South (Preston, Birmingham, and Guildford).

- **Centrally commissioned (c.30% of volumes)**
  NHS England pays for PET-North and PET-South - the only contracts negotiated directly by specialised services commissioners.

The question NHS England now faces given the pending recommissioning exercise is whether a coordinated and centralised choice of PET-CT provider (like the ones taken when letting the two regional contracts) best serves patient needs.

This is not a simple question, and it is worth acknowledging the various challenges faced by specialised services when deciding the level at which commissioning decisions should be made moving forward:
Proposed commissioning of new PET-CT services in England

Increasing patient and clinician expectations need to be met by in-house or independent sector providers, notwithstanding all the other challenges detailed below.

**Explanation**

One of the main reasons for letting PET-North and PET-South was to ensure access to PET-CT services for all patients, not just those living near major conurbations. While access has improved, increasing PET-CT usage means the installed base has limited (if any) spare capacity. Going forward, access may no longer refer to the location of a patient’s nearest PET-CT scanner, but whether or not the examination can be performed within the specified time period.

All NHS budgets are under pressure to identify savings. Any recommissioning exercise is therefore an opportunity to achieve greater value for money.

The current process needs to provide a long-term solution to the expected installation of new scanners, in the medium-long term, especially as the use of PET-CT for non-cancer reasons (e.g. Alzheimer’s) increases.

Deployment of a static scanner and the surrounding building can take over a year from start to finish. Given commissioned services need to be operational on April 1st 2015, there is limited time for the scanner installation, the building of new facilities, and the training of staff to provide high quality PET-CT services.

### Challenge 1. Clinical excellence

*Increasing patient and clinician expectations need to be met by in-house or independent sector providers, notwithstanding all the other challenges detailed below.*

### Challenge 2. Ensuring access irrespective of location

*One of the main reasons for letting PET-North and PET-South was to ensure access to PET-CT services for all patients, not just those living near major conurbations.*

While access has improved, increasing PET-CT usage means the installed base has limited (if any) spare capacity. Going forward, access may no longer refer to the location of a patient’s nearest PET-CT scanner, but whether or not the examination can be performed within the specified time period.

### Challenge 3. Budgetary pressure

*All NHS budgets are under pressure to identify savings. Any recommissioning exercise is therefore an opportunity to achieve greater value for money.*

### Challenge 4. Future-proofing

*The current process needs to provide a long-term solution to the expected installation of new scanners, in the medium-long term, especially as the use of PET-CT for non-cancer reasons (e.g. Alzheimer’s) increases.*

### Challenge 5. Tight timeframe

*Deployment of a static scanner and the surrounding building can take over a year from start to finish. Given commissioned services need to be operational on April 1st 2015, there is limited time for the scanner installation, the building of new facilities, and the training of staff to provide high quality PET-CT services.*

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### The Core Objectives when Commissioning the new PET CT Contracts

Considering these challenges alongside prevailing market dynamics (less developed PET-CT infrastructure than European comparators, increasing demand and applications for PET-CT services), we identify four core objectives when commissioning new PET-CT services:

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### Fig 11. Core objectives when commissioning new PET-CT services

#### Challenges

<table>
<thead>
<tr>
<th>Clinical excellence</th>
<th>Ensuring access</th>
<th>Budgetary pressure</th>
<th>Future proofing</th>
<th>Tight timeframes</th>
</tr>
</thead>
</table>

#### Market dynamics

<table>
<thead>
<tr>
<th>Underdeveloped PET-CT infrastructure</th>
<th>Increasing PET-CT usage</th>
</tr>
</thead>
</table>

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### Objective

**SERVICE FLEXIBILITY**

In order to meet the needs of different Trusts with different usage patterns for PET-CT, commissioning services capable of supporting these varied requirements will be key.

**Research access**

Trusts have differing research support requirements. Over time, developments in molecular imaging are likely to increase research demands for access to these services. Are the operating models of ‘in-house’ and independent sector providers capable of dealing with these differing and increasing levels of research demand?

**Clinical access**

Some sites currently served by PET-North and PET-South are reaching the level of activity that would benefit from a fixed PET-CT installation with 7-day-a-week access. Other sites do not have sufficient scale to support such an investment. Is the commissioned solution capable of serving both types of requirement effectively?

**Choice of equipment**

Different PET-CT machines have different capabilities. A ‘one size fits all approach’ to equipment selection is unlikely to satisfy the needs of all cancer centres and hospitals.

**Research access**

Local researchers should be engaged to understand their access and radioisotope requirements, as well as any common reporting and/or operational requirements to ensure research findings are comparable across different research programmes.

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**CLINICIAN INVOLVEMENT**

Ultimately, clinicians are the best judge of the needs of their patients. Any commissioning exercise needs to take account of localised commissioning requirements. This will likely include (but not be limited to):

- **Choice of equipment**
  - Different PET-CT machines have different capabilities. A ‘one size fits all approach’ to equipment selection is unlikely to satisfy the needs of all cancer centres and hospitals.
- **Research access**
  - Local researchers should be engaged to understand their access and radioisotope requirements, as well as any common reporting and/or operational requirements to ensure research findings are comparable across different research programmes.

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**SERVICE RESILIENCE**

In order to ensure the commissioned service is a resilient one, minimum standards should be upheld by the provider (whether ‘in-house’ or independent sector).

**VALUE FOR MONEY**

All procurement exercises provide an opportunity to renegotiate contractual terms to ensure services are sustainable and affordable. The objective therefore is to effectively leverage the scale of specialised service commissioning while enabling a sufficiently ‘bespoke’ solution to the individual needs of Trusts.
Section Six

Future commissioning options for NHS England

As has been mentioned, c.30% of the UK’s PET-CT volumes will need to be recommissioned for when the PET-North and PET-South contracts expire on March 31st 2015. We have therefore considered three broad approaches NHS England could take in deciding how to commission these services going forward:

Centrally procured services for all PET-North and South sites
- This approach effectively retains the status quo
- Specialised services would commission PET-CT provision for all sites currently using the two block contracts, choosing one or more independent sector partners centrally

Locally commissioned services, with entirely devolved decision making
- This approach would require the reclassification of PET-CT as a non-specialist service, enabling local commissioners to issue a tender as they would for any other form of independent sector provision

Hybrid model where central commissioners have a dual role
- NHS England provides central support in the form of a “framework” that providers must qualify for, to ensure quality across all sites. This may or may not include agreed pricing structures – there are pros and cons to such an approach (see below)
- For sites which wish to install their own static service, they can procure locally, either moving the service in-house, or choosing a provider from the central framework
- For other sites, NHS England could adopt two approaches; allow all sites to call off volumes from the central framework (supporting local sites in this process if required), or procure one or more multi-site contracts (as per the current arrangements)

It should be noted that these are commissioning decisions only. We understand Specialised Services has already committed to continue funding these services moving forward, so the question here is around how decisions are made to determine who provides the required scanning activity.
Evaluation of the potential approaches
Comparing each of these three options with our strategic commissioning objectives will help us to identify the types of commissioning approach capable of delivering PET-CT service requirements moving forward:

**Fig 12. Assessment of Commissioning Options versus key objectives**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Centrally procured</th>
<th>Locally commissioned</th>
<th>Hybrid</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service flexibility</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
<td>A centrally procured model will limit scope for individual Trusts to define research and clinical access requirements (for example through the choice of a static or mobile offering). Furthermore, centralised decision making will make service expansion to new sites more difficult, especially if aspirations to provide these services develop after contracts are let.</td>
</tr>
<tr>
<td>Clinician involvement</td>
<td>(✓)</td>
<td>(✓)</td>
<td>✓</td>
<td>While both a central procurement exercise and locally commissioned services will undoubtedly incorporate clinicians’ views, the former will take no account of localised clinical requirements and the latter will require clinical input from ‘non-expert’ Trusts who will not be capable of making an informed choice. Only a hybrid model will offer choice and input only to those clinicians that are sufficiently expert to define their PET-CT requirements.</td>
</tr>
<tr>
<td>Service resilience</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>PET-CT services that are not centrally supported could lead to certain non-expert Trusts choosing services with insufficient reporting requirements and governance procedures.</td>
</tr>
<tr>
<td>Value for money</td>
<td>✓</td>
<td>(✓)</td>
<td>✓</td>
<td>Local commissioning can drive value for money as each tender is contested, although local variances in pricing would be expected. However, some form of central pricing support, whether through a framework that sets agreed pricing structures, or through an agreed price for a contract with multiple sites, may deliver better value for money. NHS England will need to assess whether national or local pricing is preferred, considering whether the large number of variables (e.g. equipment choice) can be included in a national price per scan.</td>
</tr>
</tbody>
</table>
Proposed commissioning of new PET-CT services in England

After considering the various commissioning options in light of our aforementioned objectives, it appears a more flexible ‘hybrid’ commissioning model would be the best way forward, combining the expertise of central support with the needs of local clinicians and Trusts, especially those that have a high level of PET-CT knowledge, and those that wish to transition from a mobile to a static solution. We believe this empowers local clinicians to develop their research objectives and allows NHS Trusts to develop their services around PET-CT scanners (in both cancer and other areas), whilst ensuring the benefits of centralised commissioning are preserved.

This approach would leave NHS England Specialised Services with four key questions to answer to help define the next generation of PET-CT service provision:

1. What proficiencies and/or volumes must be demonstrated by a cancer centre or hospital for the facility to be deemed ‘expert’ in the commissioning of PET-CT services?
2. Can those that are not deemed “expert” effectively use an NHS framework to procure their own service (e.g. 2 days of mobile support per week) or should these be wrapped into one or more block contracts, similar to what exists today?
3. What type of framework pricing mechanism, if any, should be used to secure value for money while still ensuring the flexibility of service that makes the hybrid model so appealing?
4. How can service continuity be ensured during the transition phase from April 2015 onwards?

If NHS England can answer these questions, Credo sees no reason why parity cannot be achieved with Western European comparators for PET-CT availability, whilst ensuring sustainable, high quality and affordable PET-CT provision that is capable of meeting England’s cancer treatment needs longer term.

Section Seven

Conclusion

After considering the various commissioning options in light of our aforementioned objectives, it appears a more flexible ‘hybrid’ commissioning model would be the best way forward, combining the expertise of central support with the needs of local clinicians and Trusts, especially those that have a high level of PET-CT knowledge, and those that wish to transition from a mobile to a static solution. We believe this empowers local clinicians to develop their research objectives and allows NHS Trusts to develop their services around PET-CT scanners (in both cancer and other areas), whilst ensuring the benefits of centralised commissioning are preserved.

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For more information about Credo, its core services and areas of focus, please visit  
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