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What can really do EPR retrospective dosimetry? Feedback experience on 25 years of radiological accident management

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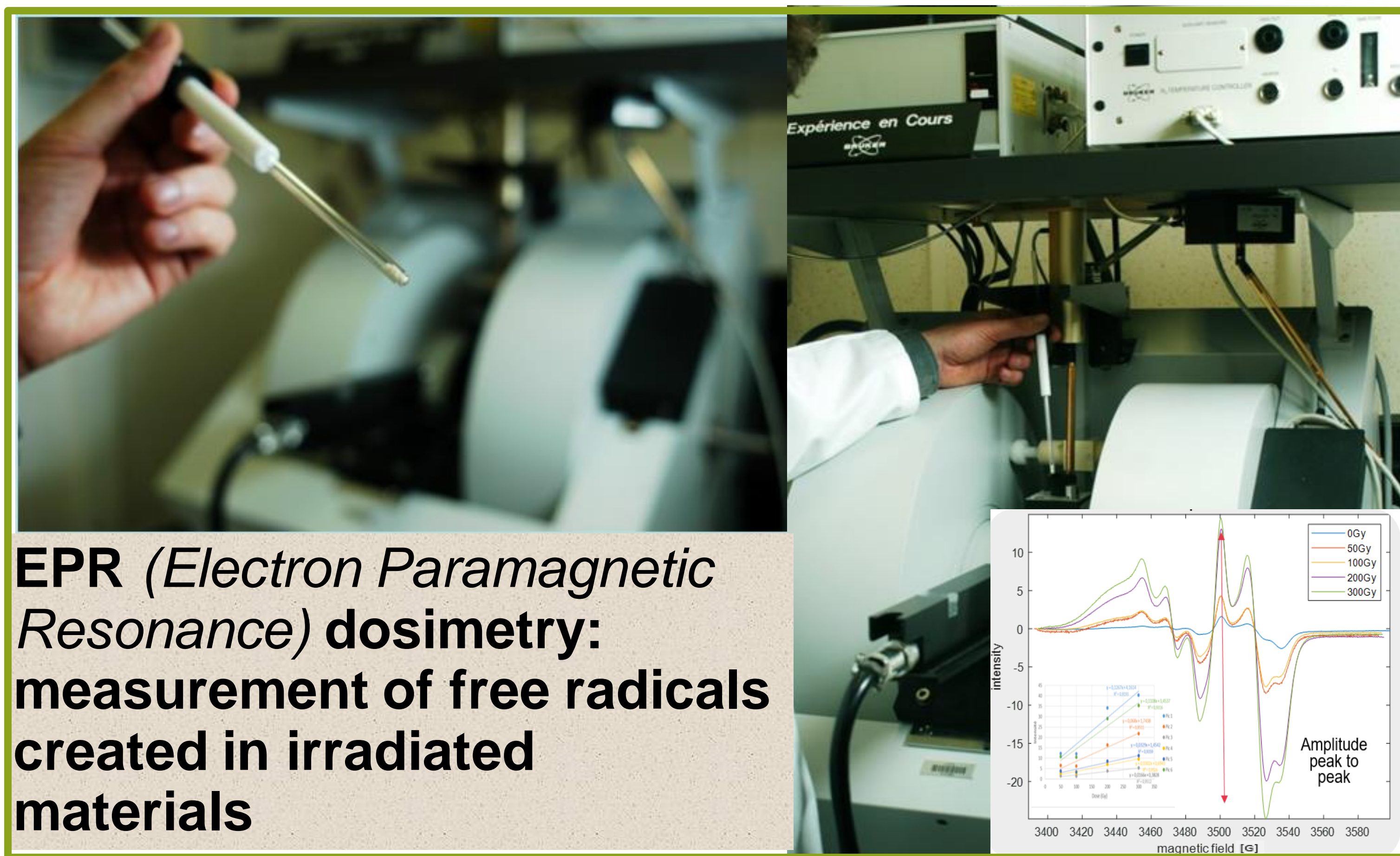
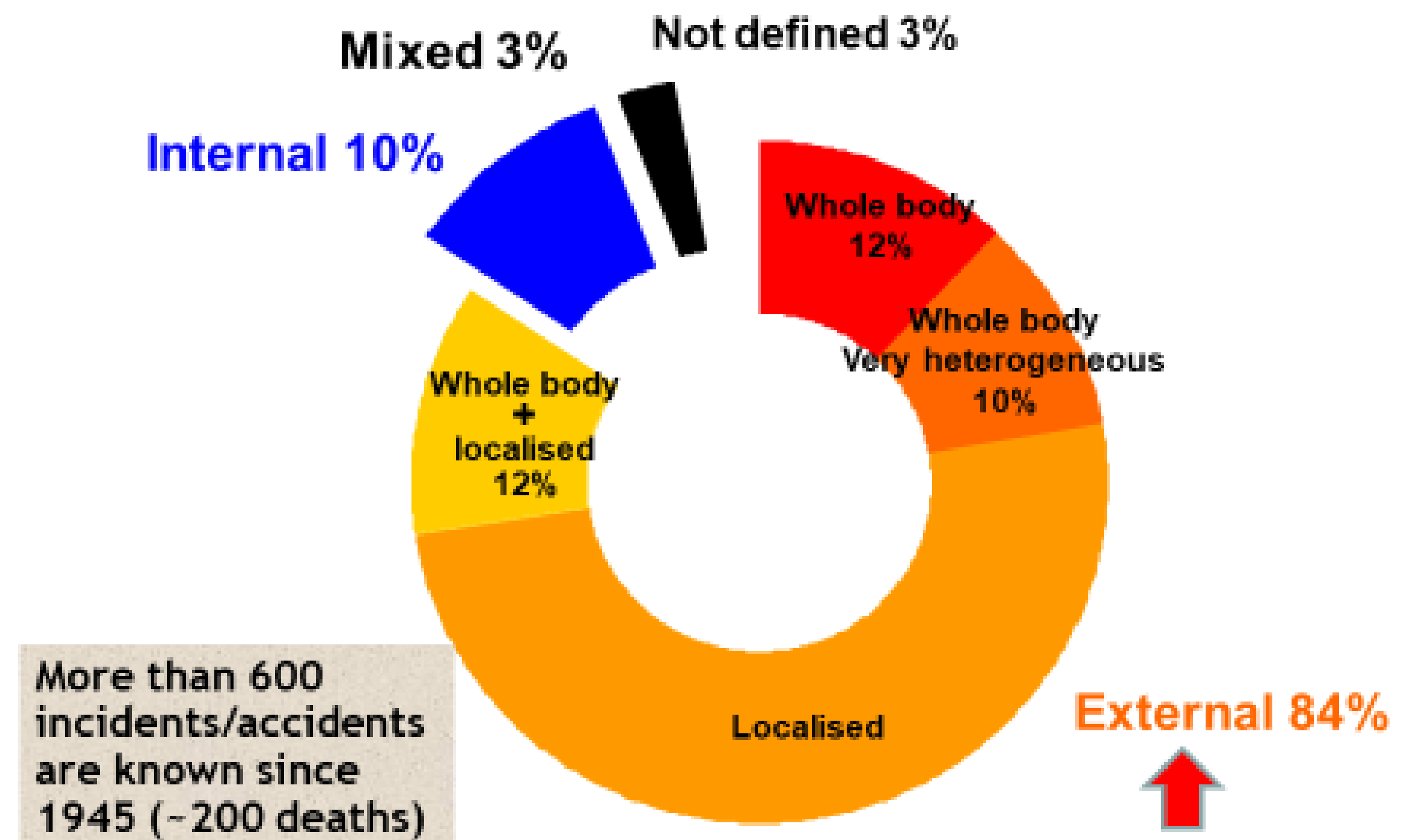
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Main lessons learnt of radiological accidents:

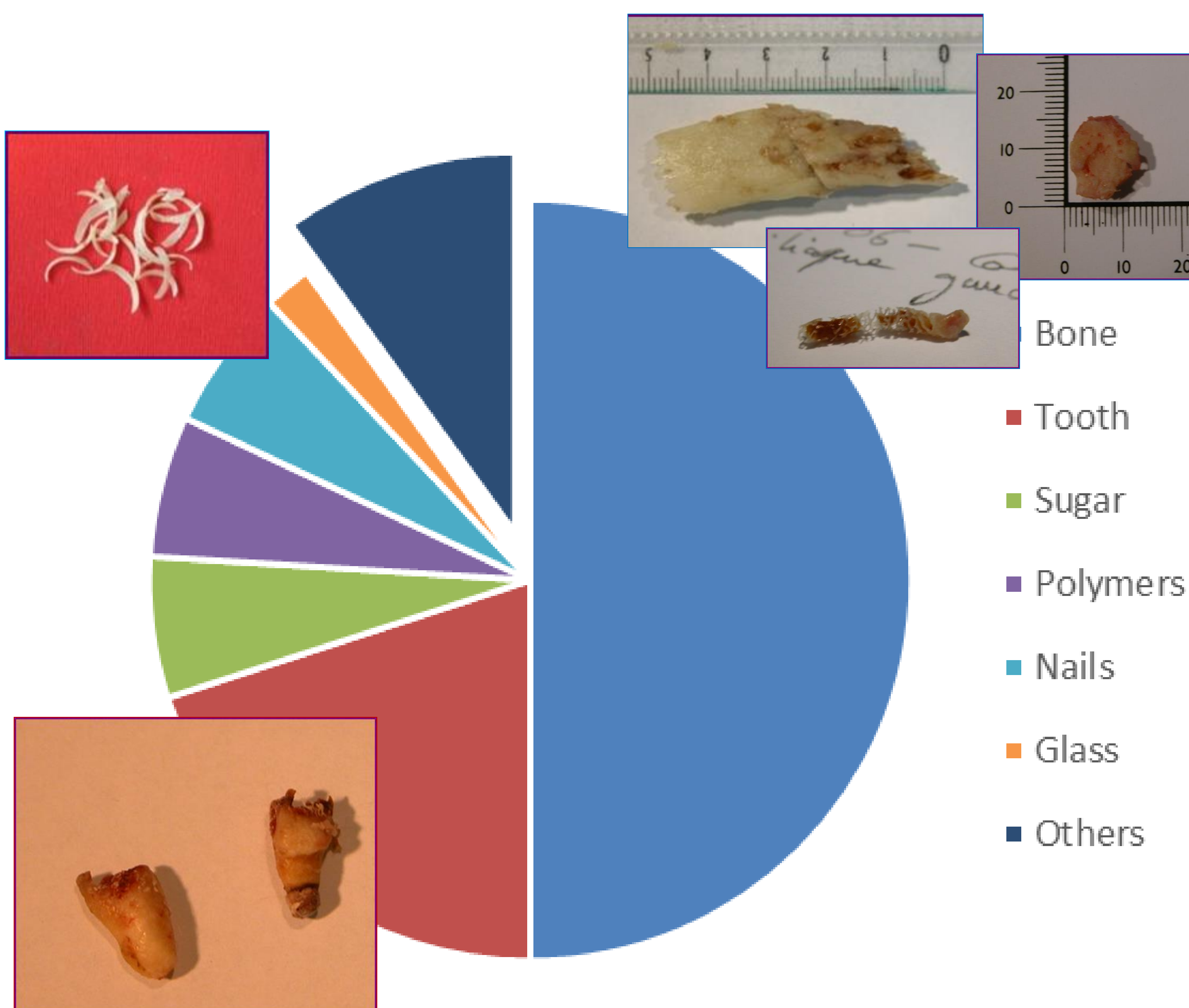
- Dose distribution is always **heterogeneous** even for whole body irradiation
- For most cases: partial body and **localized irradiation with high dose**
- For localized irradiation: estimation of **maximal dose** and doses at organs at risk
- **Dose distribution** is far more important than whole body dose for medical management decisions
- **Multi-techniques approach** with biological dosimetry, calculation and retrospective dosimetry on biological tissue or objects is requested.
- **No gold technique**: toolbox of retrospective dosimetry techniques needed to address all possible situations
- **EPR dosimetry** on biological tissue very pertinent for high local dose (bone, nails)



EPR dosimetry techniques



Examples of published expertise having used EPR dosimetry



Repartition of samples used for EPR dosimetry expertise

Main feedbacks:

- Versatile technique, numerous types of samples used
- Bone sample the most used
- EPR dosimetry pertinent for localized irradiation to estimate maximal dose (bone, nails)
- For whole body irradiation, can provide an index of heterogeneity of dose distribution
- Successfully used with other techniques or alone
- New approaches of EPR can limit the invasiveness of sampling (cf. EPR Q-band)
- New materials such as glass in smartphone promising