

Reporting the Right Information for Stem Cell Studies is Important

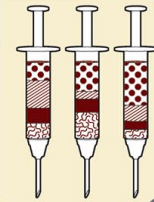
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Clinical benefits of **mesenchymal stem cells (MSCs)** are not yet known

Treatments & Preparations are **Highly** Variable

Variables include:

- Donor variables
- Tissue Sources
- Processing
- Culture
- ...and more



This leads to



Variable outcomes



24 experts from **4** continents

Poor Reporting Limits Progress

Minimum Guidelines are **Needed**

A study has shown that of **51** stem cell studies **NONE** reported sufficient details

an international effort by clinicians and scientists to establish consensus on minimum reporting guidelines

Checklist developed using the **DELPHI** process

response rate: **96%**

agreement: **98%**

The resulting **CHECKLIST** Minimum Information for BiOlogics (MIBO) has **26** statements

Dissemination & Adoption of the MIBO

Recommended by:

- Equator network
- Bone & Joint Research
- and other journals

3 rounds of surveys

Use MIBO for your MSC Clinical trials

and share this information widely.



Continue the discussion @ www.mibo-statement.org

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There is great enthusiasm for the use of biologic therapies to treat a range of musculoskeletal injuries and pathologies.^{1,2} The ability for mesenchymal stem cells (MSCs) to differentiate into multiple cell types and release pro-regenerative growth factors holds great promise for musculoskeletal tissue engineering.^{3,4} However, their clinical benefits are not yet clear. A large number of factors including donor variables, tissue source, processing and laboratory conditions, and pathology timing influence the effect of biologic therapies.⁵⁻⁷ Many emerging clinical trials evaluating biologics do not report sufficient scientific details, including processing and characterization, which may critically impact outcome.⁸ Inadequate reporting of scientific details limits the readers' ability to interpret findings, makes replication by others challenging and prevents comparison across studies.⁹

To encourage improved reporting, minimum standards of reporting specific to stem cells have recently been developed.¹⁰ In an international effort by clinicians and scientists, a consensus on the minimum reporting guidelines for clinical studies evaluating MSCs was achieved using Delphi Consensus Methods (so called Minimum Information for Biologics or MIBO).¹⁰ Adoption of such checklists will help improve experimental transparency and repeatability, promote standardization and encourage a wider collaborative effort.

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References

- Murray IR, LaPrade RF.** Platelet-rich plasma: renewed scientific understanding must guide appropriate use. *Bone Joint Res* 2016;5:92-94.
- Ismail HD, Phedy P, Kholinne E, et al.** Mesenchymal stem cell implantation in atrophic nonunion of the long bones: A translational study. *Bone Joint Res* 2016;5:287-293.
- Murray IR, Corselli M, Petrigliano FA, Soo C, Péault B.** Recent insights into the identity of mesenchymal stem cells: implications for orthopaedic applications. *Bone Joint J* 2014;96-B:291-298.
- Yang Y, Lin S, Wang B, Gu W, Li G.** Stem cell therapy for enhancement of bone consolidation in distraction osteogenesis: A contemporary review of experimental studies. *Bone Joint Res* 2017;6:385-390.
- Gruber HE, Ode G, Hoelscher G, et al.** Osteogenic, stem cell and molecular characterisation of the human induced membrane from extremity bone defects. *Bone Joint Res* 2016;5:106-115.
- Phetfong J, Tawonsawatruk T, Seenprachawong K, et al.** Re-using blood products as an alternative supplement in the optimisation of clinical-grade adipose-derived mesenchymal stem cell culture. *Bone Joint Res* 2017;6:414-422.
- LaPrade RF, Dragoo JL, Koh JL, et al.** AAOS Research Symposium updates and consensus: biologic treatment of orthopaedic injuries. *J Am Acad Orthop Surg* 2016;24:e62-78.
- Chahla J, Cinque ME, Piuze NS, et al.** A call for standardization in platelet-rich plasma preparation protocols and composition reporting: a systematic review of the clinical orthopaedic literature. *J Bone Joint Surg [Am]* 2017;99-A:1769-1779.
- Murray IR, LaPrade RF, Musahl V, et al.** Biologic treatments for sports injuries II think tank-current concepts, future research, and barriers to advancement, part 2: rotator cuff. *Orthop J Sports Med* 2016;4:2325967116636586.
- Murray IR, Geeslin AG, Goudie EB, Petrigliano FA, LaPrade RF.** Minimum information for studies evaluating biologics in orthopaedics (MIBO): platelet-rich plasma and mesenchymal stem cells. *J Bone Joint Surg [Am]* 2017;99-A:809-819.

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Conflict of Interest Statement

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